

Some Examples

		A		C		T			
		0	-99	-99	-99	-99	-99	-99	-99
		-99		-2		-3		-4	
		a--		--c		--c		--c	
		a--	a--	--c	--c	--c	--c	--c	--c
G		-99	-2	-1	-4	-3	-5	-4	-6
G		-99		-4		-3		-4	
		-b-	-b-	a--	a--	a-c	a-c	a-c	a-c
A		-99	-3	-1	-3	-2	-5	-4	-6
A		-99		-5		-3		-4	
		-b-	-b-	a--	a--	a--	a--	a-c	a-c
T		-99	-4	-4	-3	-2	-4	-1	-6
T		-99		-6		-5		-4	
		-b-	-b-	a--	a--	a--	a--	a-c	a-c

Match = 1
 Mismatch = -1
 Init gap = -2
 Cont. gap = -1

			G		A		C		A		A																								
	<table border="1"><tr><td>0</td><td>-99</td></tr><tr><td>-99</td><td></td></tr></table>	0	-99	-99		a--	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-5</td><td></td></tr></table>	-99	-99	-5		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-7</td><td></td></tr></table>	-99	-99	-7		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-9</td><td></td></tr></table>	-99	-99	-9		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-11</td><td></td></tr></table>	-99	-99	-11		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-13</td><td></td></tr></table>	-99	-99	-13	
0	-99																																		
-99																																			
-99	-99																																		
-5																																			
-99	-99																																		
-7																																			
-99	-99																																		
-9																																			
-99	-99																																		
-11																																			
-99	-99																																		
-13																																			
	a--	a--	--c	--c	--c	--c	--c	--c	--c	--c	--c																								
A	<table border="1"><tr><td>-99</td><td>-5</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-5	-99		-b-	<table border="1"><tr><td>-1</td><td>-10</td></tr><tr><td>-10</td><td></td></tr></table>	-1	-10	-10		a--	<table border="1"><tr><td>-4</td><td>-12</td></tr><tr><td>-6</td><td></td></tr></table>	-4	-12	-6		--c	<table border="1"><tr><td>-8</td><td>-14</td></tr><tr><td>-8</td><td></td></tr></table>	-8	-14	-8		--c	<table border="1"><tr><td>-8</td><td>-16</td></tr><tr><td>-10</td><td></td></tr></table>	-8	-16	-10		--c	<table border="1"><tr><td>-10</td><td>-18</td></tr><tr><td>-12</td><td></td></tr></table>	-10	-18	-12	
-99	-5																																		
-99																																			
-1	-10																																		
-10																																			
-4	-12																																		
-6																																			
-8	-14																																		
-8																																			
-8	-16																																		
-10																																			
-10	-18																																		
-12																																			
	-b-	-b-	a--	a--	a--	a--	a-c	a-c	a--	a--	a--																								
C	<table border="1"><tr><td>-99</td><td>-7</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-7	-99		-b-	<table border="1"><tr><td>-6</td><td>-6</td></tr><tr><td>-12</td><td></td></tr></table>	-6	-6	-12		ab-	<table border="1"><tr><td>-2</td><td>-9</td></tr><tr><td>-11</td><td></td></tr></table>	-2	-9	-11		a--	<table border="1"><tr><td>-3</td><td>-13</td></tr><tr><td>-7</td><td></td></tr></table>	-3	-13	-7		a--	<table border="1"><tr><td>-9</td><td>-13</td></tr><tr><td>-8</td><td></td></tr></table>	-9	-13	-8		--c	<table border="1"><tr><td>-9</td><td>-15</td></tr><tr><td>-10</td><td></td></tr></table>	-9	-15	-10	
-99	-7																																		
-99																																			
-6	-6																																		
-12																																			
-2	-9																																		
-11																																			
-3	-13																																		
-7																																			
-9	-13																																		
-8																																			
-9	-15																																		
-10																																			
	-b-	-b-	-b-	ab-	a--	a--	a--	a--	--c	--c	a--																								
G	<table border="1"><tr><td>-99</td><td>-9</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-9	-99		-b-	<table border="1"><tr><td>-6</td><td>-8</td></tr><tr><td>-14</td><td></td></tr></table>	-6	-8	-14		a--	<table border="1"><tr><td>-7</td><td>-7</td></tr><tr><td>-11</td><td></td></tr></table>	-7	-7	-11		ab-	<table border="1"><tr><td>-3</td><td>-8</td></tr><tr><td>-12</td><td></td></tr></table>	-3	-8	-12		a--	<table border="1"><tr><td>-4</td><td>-13</td></tr><tr><td>-8</td><td></td></tr></table>	-4	-13	-8		a--	<table border="1"><tr><td>-9</td><td>-14</td></tr><tr><td>-9</td><td></td></tr></table>	-9	-14	-9	
-99	-9																																		
-99																																			
-6	-8																																		
-14																																			
-7	-7																																		
-11																																			
-3	-8																																		
-12																																			
-4	-13																																		
-8																																			
-9	-14																																		
-9																																			
	-b-	-b-	-b-	a--	-b-	ab-	a--	a--	a--	a--	a-c																								
A	<table border="1"><tr><td>-99</td><td>-11</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-11	-99		-b-	<table border="1"><tr><td>-10</td><td>-10</td></tr><tr><td>-16</td><td></td></tr></table>	-10	-10	-16		ab-	<table border="1"><tr><td>-5</td><td>-9</td></tr><tr><td>-15</td><td></td></tr></table>	-5	-9	-15		a--	<table border="1"><tr><td>-8</td><td>-8</td></tr><tr><td>-10</td><td></td></tr></table>	-8	-8	-10		--c	<table border="1"><tr><td>-2</td><td>-9</td></tr><tr><td>-12</td><td></td></tr></table>	-2	-9	-12		a--	<table border="1"><tr><td>-3</td><td>-14</td></tr><tr><td>-7</td><td></td></tr></table>	-3	-14	-7	
-99	-11																																		
-99																																			
-10	-10																																		
-16																																			
-5	-9																																		
-15																																			
-8	-8																																		
-10																																			
-2	-9																																		
-12																																			
-3	-14																																		
-7																																			
	-b-	-b-	-b-	ab-	a--	a--	-b-	ab-	a--	a--	a--																								
C	<table border="1"><tr><td>-99</td><td>-13</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-13	-99		-b-	<table border="1"><tr><td>-12</td><td>-12</td></tr><tr><td>-18</td><td></td></tr></table>	-12	-12	-18		ab-	<table border="1"><tr><td>-11</td><td>-10</td></tr><tr><td>-17</td><td></td></tr></table>	-11	-10	-17		-b-	<table border="1"><tr><td>-4</td><td>-10</td></tr><tr><td>-15</td><td></td></tr></table>	-4	-10	-15		a--	<table border="1"><tr><td>-9</td><td>-7</td></tr><tr><td>-9</td><td></td></tr></table>	-9	-7	-9		--c	<table border="1"><tr><td>-3</td><td>-8</td></tr><tr><td>-11</td><td></td></tr></table>	-3	-8	-11	
-99	-13																																		
-99																																			
-12	-12																																		
-18																																			
-11	-10																																		
-17																																			
-4	-10																																		
-15																																			
-9	-7																																		
-9																																			
-3	-8																																		
-11																																			
	-b-	-b-	-b-	ab-	-b-	-b-	a--	a--	-b-	-b-	a--																								
A	<table border="1"><tr><td>-99</td><td>-15</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-15	-99		-b-	<table border="1"><tr><td>-14</td><td>-14</td></tr><tr><td>-20</td><td></td></tr></table>	-14	-14	-20		ab-	<table border="1"><tr><td>-11</td><td>-12</td></tr><tr><td>-19</td><td></td></tr></table>	-11	-12	-19		a--	<table border="1"><tr><td>-11</td><td>-9</td></tr><tr><td>-16</td><td></td></tr></table>	-11	-9	-16		-b-	<table border="1"><tr><td>-3</td><td>-9</td></tr><tr><td>-14</td><td></td></tr></table>	-3	-9	-14		a--	<table border="1"><tr><td>-6</td><td>-8</td></tr><tr><td>-8</td><td></td></tr></table>	-6	-8	-8	
-99	-15																																		
-99																																			
-14	-14																																		
-20																																			
-11	-12																																		
-19																																			
-11	-9																																		
-16																																			
-3	-9																																		
-14																																			
-6	-8																																		
-8																																			

Match = 1
 Mismatch = -1
 Init gap = -5
 Cont. gap = -2

		A	G	G	G	C	C																													
		<table border="1"><tr><td>0</td><td>-99</td></tr><tr><td>-99</td><td></td></tr></table>	0	-99	-99		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-11</td><td></td></tr></table>	-99	-99	-11		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-12</td><td></td></tr></table>	-99	-99	-12		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-13</td><td></td></tr></table>	-99	-99	-13		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-14</td><td></td></tr></table>	-99	-99	-14		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-15</td><td></td></tr></table>	-99	-99	-15		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-16</td><td></td></tr></table>	-99	-99	-16	
0	-99																																			
-99																																				
-99	-99																																			
-11																																				
-99	-99																																			
-12																																				
-99	-99																																			
-13																																				
-99	-99																																			
-14																																				
-99	-99																																			
-15																																				
-99	-99																																			
-16																																				
	a--	a--	--c	--c	--c	--c	--c																													
A		<table border="1"><tr><td>-99</td><td>-11</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-11	-99		<table border="1"><tr><td>4</td><td>-22</td></tr><tr><td>-22</td><td></td></tr></table>	4	-22	-22		<table border="1"><tr><td>-12</td><td>-23</td></tr><tr><td>-7</td><td></td></tr></table>	-12	-23	-7		<table border="1"><tr><td>-13</td><td>-24</td></tr><tr><td>-8</td><td></td></tr></table>	-13	-24	-8		<table border="1"><tr><td>-14</td><td>-25</td></tr><tr><td>-9</td><td></td></tr></table>	-14	-25	-9		<table border="1"><tr><td>-15</td><td>-26</td></tr><tr><td>-10</td><td></td></tr></table>	-15	-26	-10		<table border="1"><tr><td>-16</td><td>-27</td></tr><tr><td>-11</td><td></td></tr></table>	-16	-27	-11	
-99	-11																																			
-99																																				
4	-22																																			
-22																																				
-12	-23																																			
-7																																				
-13	-24																																			
-8																																				
-14	-25																																			
-9																																				
-15	-26																																			
-10																																				
-16	-27																																			
-11																																				
	-b-	-b-	a--	a--	--c	--c	--c																													
G		<table border="1"><tr><td>-99</td><td>-12</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-12	-99		<table border="1"><tr><td>-12</td><td>-7</td></tr><tr><td>-23</td><td></td></tr></table>	-12	-7	-23		<table border="1"><tr><td>8</td><td>-18</td></tr><tr><td>-18</td><td></td></tr></table>	8	-18	-18		<table border="1"><tr><td>-3</td><td>-19</td></tr><tr><td>-3</td><td></td></tr></table>	-3	-19	-3		<table border="1"><tr><td>-4</td><td>-20</td></tr><tr><td>-4</td><td></td></tr></table>	-4	-20	-4		<table border="1"><tr><td>-10</td><td>-21</td></tr><tr><td>-5</td><td></td></tr></table>	-10	-21	-5		<table border="1"><tr><td>-11</td><td>-22</td></tr><tr><td>-6</td><td></td></tr></table>	-11	-22	-6	
-99	-12																																			
-99																																				
-12	-7																																			
-23																																				
8	-18																																			
-18																																				
-3	-19																																			
-3																																				
-4	-20																																			
-4																																				
-10	-21																																			
-5																																				
-11	-22																																			
-6																																				
	-b-	-b-	-b-	-b-	a--	a--	a-c																													
G		<table border="1"><tr><td>-99</td><td>-13</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-13	-99		<table border="1"><tr><td>-13</td><td>-8</td></tr><tr><td>-24</td><td></td></tr></table>	-13	-8	-24		<table border="1"><tr><td>-3</td><td>-3</td></tr><tr><td>-19</td><td></td></tr></table>	-3	-3	-19		<table border="1"><tr><td>12</td><td>-14</td></tr><tr><td>-14</td><td></td></tr></table>	12	-14	-14		<table border="1"><tr><td>1</td><td>-15</td></tr><tr><td>1</td><td></td></tr></table>	1	-15	1		<table border="1"><tr><td>-5</td><td>-16</td></tr><tr><td>0</td><td></td></tr></table>	-5	-16	0		<table border="1"><tr><td>-6</td><td>-17</td></tr><tr><td>-1</td><td></td></tr></table>	-6	-17	-1	
-99	-13																																			
-99																																				
-13	-8																																			
-24																																				
-3	-3																																			
-19																																				
12	-14																																			
-14																																				
1	-15																																			
1																																				
-5	-16																																			
0																																				
-6	-17																																			
-1																																				
	-b-	-b-	-b-	-b-	ab-	a--	a--																													
A		<table border="1"><tr><td>-99</td><td>-14</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-14	-99		<table border="1"><tr><td>-9</td><td>-9</td></tr><tr><td>-25</td><td></td></tr></table>	-9	-9	-25		<table border="1"><tr><td>-9</td><td>-4</td></tr><tr><td>-20</td><td></td></tr></table>	-9	-4	-20		<table border="1"><tr><td>-4</td><td>1</td></tr><tr><td>-15</td><td></td></tr></table>	-4	1	-15		<table border="1"><tr><td>11</td><td>-10</td></tr><tr><td>-10</td><td></td></tr></table>	11	-10	-10		<table border="1"><tr><td>0</td><td>-11</td></tr><tr><td>0</td><td></td></tr></table>	0	-11	0		<table border="1"><tr><td>-1</td><td>-12</td></tr><tr><td>-1</td><td></td></tr></table>	-1	-12	-1	
-99	-14																																			
-99																																				
-9	-9																																			
-25																																				
-9	-4																																			
-20																																				
-4	1																																			
-15																																				
11	-10																																			
-10																																				
0	-11																																			
0																																				
-1	-12																																			
-1																																				
	-b-	-b-	-b-	ab-	-b-	-b-	-b-																													
C		<table border="1"><tr><td>-99</td><td>-15</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-15	-99		<table border="1"><tr><td>-15</td><td>-10</td></tr><tr><td>-26</td><td></td></tr></table>	-15	-10	-26		<table border="1"><tr><td>-10</td><td>-5</td></tr><tr><td>-21</td><td></td></tr></table>	-10	-5	-21		<table border="1"><tr><td>-5</td><td>0</td></tr><tr><td>-16</td><td></td></tr></table>	-5	0	-16		<table border="1"><tr><td>0</td><td>0</td></tr><tr><td>-11</td><td></td></tr></table>	0	0	-11		<table border="1"><tr><td>15</td><td>-11</td></tr><tr><td>-11</td><td></td></tr></table>	15	-11	-11		<table border="1"><tr><td>4</td><td>-12</td></tr><tr><td>4</td><td></td></tr></table>	4	-12	4	
-99	-15																																			
-99																																				
-15	-10																																			
-26																																				
-10	-5																																			
-21																																				
-5	0																																			
-16																																				
0	0																																			
-11																																				
15	-11																																			
-11																																				
4	-12																																			
4																																				
	-b-	-b-	-b-	-b-	-b-	-b-	-b-																													
G		<table border="1"><tr><td>-99</td><td>-16</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-16	-99		<table border="1"><tr><td>-16</td><td>-11</td></tr><tr><td>-27</td><td></td></tr></table>	-16	-11	-27		<table border="1"><tr><td>-6</td><td>-6</td></tr><tr><td>-22</td><td></td></tr></table>	-6	-6	-22		<table border="1"><tr><td>-1</td><td>-1</td></tr><tr><td>-17</td><td></td></tr></table>	-1	-1	-17		<table border="1"><tr><td>4</td><td>-1</td></tr><tr><td>-12</td><td></td></tr></table>	4	-1	-12		<table border="1"><tr><td>-1</td><td>4</td></tr><tr><td>-7</td><td></td></tr></table>	-1	4	-7		<table border="1"><tr><td>14</td><td>-7</td></tr><tr><td>-7</td><td></td></tr></table>	14	-7	-7	
-99	-16																																			
-99																																				
-16	-11																																			
-27																																				
-6	-6																																			
-22																																				
-1	-1																																			
-17																																				
4	-1																																			
-12																																				
-1	4																																			
-7																																				
14	-7																																			
-7																																				
	-b-	-b-	-b-	-b-	ab-	-b-	ab-																													
A		<table border="1"><tr><td>-99</td><td>-17</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-17	-99		<table border="1"><tr><td>-12</td><td>-12</td></tr><tr><td>-28</td><td></td></tr></table>	-12	-12	-28		<table border="1"><tr><td>-12</td><td>-7</td></tr><tr><td>-23</td><td></td></tr></table>	-12	-7	-23		<table border="1"><tr><td>-7</td><td>-2</td></tr><tr><td>-18</td><td></td></tr></table>	-7	-2	-18		<table border="1"><tr><td>-2</td><td>-2</td></tr><tr><td>-13</td><td></td></tr></table>	-2	-2	-13		<table border="1"><tr><td>3</td><td>3</td></tr><tr><td>-13</td><td></td></tr></table>	3	3	-13		<table border="1"><tr><td>3</td><td>3</td></tr><tr><td>-8</td><td></td></tr></table>	3	3	-8	
-99	-17																																			
-99																																				
-12	-12																																			
-28																																				
-12	-7																																			
-23																																				
-7	-2																																			
-18																																				
-2	-2																																			
-13																																				
3	3																																			
-13																																				
3	3																																			
-8																																				
	-b-	-b-	-b-	ab-	-b-	-b-	-b-																													
C		<table border="1"><tr><td>-99</td><td>-18</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-18	-99		<table border="1"><tr><td>-18</td><td>-13</td></tr><tr><td>-29</td><td></td></tr></table>	-18	-13	-29		<table border="1"><tr><td>-13</td><td>-8</td></tr><tr><td>-24</td><td></td></tr></table>	-13	-8	-24		<table border="1"><tr><td>-8</td><td>-3</td></tr><tr><td>-19</td><td></td></tr></table>	-8	-3	-19		<table border="1"><tr><td>-3</td><td>-3</td></tr><tr><td>-14</td><td></td></tr></table>	-3	-3	-14		<table border="1"><tr><td>2</td><td>2</td></tr><tr><td>-14</td><td></td></tr></table>	2	2	-14		<table border="1"><tr><td>7</td><td>2</td></tr><tr><td>-9</td><td></td></tr></table>	7	2	-9	
-99	-18																																			
-99																																				
-18	-13																																			
-29																																				
-13	-8																																			
-24																																				
-8	-3																																			
-19																																				
-3	-3																																			
-14																																				
2	2																																			
-14																																				
7	2																																			
-9																																				
	-b-	-b-	-b-	-b-	-b-	-b-	ab-																													
G		<table border="1"><tr><td>-99</td><td>-19</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-19	-99		<table border="1"><tr><td>-19</td><td>-14</td></tr><tr><td>-30</td><td></td></tr></table>	-19	-14	-30		<table border="1"><tr><td>-9</td><td>-9</td></tr><tr><td>-25</td><td></td></tr></table>	-9	-9	-25		<table border="1"><tr><td>-4</td><td>-4</td></tr><tr><td>-20</td><td></td></tr></table>	-4	-4	-20		<table border="1"><tr><td>1</td><td>-4</td></tr><tr><td>-15</td><td></td></tr></table>	1	-4	-15		<table border="1"><tr><td>-4</td><td>1</td></tr><tr><td>-10</td><td></td></tr></table>	-4	1	-10		<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>-10</td><td></td></tr></table>	1	1	-10	
-99	-19																																			
-99																																				
-19	-14																																			
-30																																				
-9	-9																																			
-25																																				
-4	-4																																			
-20																																				
1	-4																																			
-15																																				
-4	1																																			
-10																																				
1	1																																			
-10																																				

Match = 4
 Mismatch = -1
 Init gap = -11
 Cont. gap = -1

		A	A	G	G	C	C																																			
		<table border="1"><tr><td>0</td><td>-99</td></tr><tr><td>-99</td><td></td></tr></table>	0	-99	-99		a--	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-11</td><td></td></tr></table>	-99	-99	-11		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-12</td><td></td></tr></table>	-99	-99	-12		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-13</td><td></td></tr></table>	-99	-99	-13		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-14</td><td></td></tr></table>	-99	-99	-14		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-15</td><td></td></tr></table>	-99	-99	-15		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-16</td><td></td></tr></table>	-99	-99	-16	
0	-99																																									
-99																																										
-99	-99																																									
-11																																										
-99	-99																																									
-12																																										
-99	-99																																									
-13																																										
-99	-99																																									
-14																																										
-99	-99																																									
-15																																										
-99	-99																																									
-16																																										
		a--	a--	--c	--c	--c	--c	--c	--c	--c	--c	--c																														
A		<table border="1"><tr><td>-99</td><td>-11</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-11	-99		-b-	<table border="1"><tr><td>4</td><td>-22</td></tr><tr><td>-22</td><td></td></tr></table>	4	-22	-22		a--	<table border="1"><tr><td>-7</td><td>-23</td></tr><tr><td>-7</td><td></td></tr></table>	-7	-23	-7		--c	<table border="1"><tr><td>-13</td><td>-24</td></tr><tr><td>-8</td><td></td></tr></table>	-13	-24	-8		--c	<table border="1"><tr><td>-14</td><td>-25</td></tr><tr><td>-9</td><td></td></tr></table>	-14	-25	-9		--c	<table border="1"><tr><td>-15</td><td>-26</td></tr><tr><td>-10</td><td></td></tr></table>	-15	-26	-10		--c	<table border="1"><tr><td>-16</td><td>-27</td></tr><tr><td>-11</td><td></td></tr></table>	-16	-27	-11	
-99	-11																																									
-99																																										
4	-22																																									
-22																																										
-7	-23																																									
-7																																										
-13	-24																																									
-8																																										
-14	-25																																									
-9																																										
-15	-26																																									
-10																																										
-16	-27																																									
-11																																										
		-b-	-b-	a--	a--	a-c	a-c	--c	--c	--c	--c	--c																														
A		<table border="1"><tr><td>-99</td><td>-12</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-12	-99		-b-	<table border="1"><tr><td>-7</td><td>-7</td></tr><tr><td>-23</td><td></td></tr></table>	-7	-7	-23		ab-	<table border="1"><tr><td>8</td><td>-18</td></tr><tr><td>-18</td><td></td></tr></table>	8	-18	-18		a--	<table border="1"><tr><td>-8</td><td>-19</td></tr><tr><td>-3</td><td></td></tr></table>	-8	-19	-3		--c	<table border="1"><tr><td>-9</td><td>-20</td></tr><tr><td>-4</td><td></td></tr></table>	-9	-20	-4		--c	<table border="1"><tr><td>-10</td><td>-21</td></tr><tr><td>-5</td><td></td></tr></table>	-10	-21	-5		--c	<table border="1"><tr><td>-11</td><td>-22</td></tr><tr><td>-6</td><td></td></tr></table>	-11	-22	-6	
-99	-12																																									
-99																																										
-7	-7																																									
-23																																										
8	-18																																									
-18																																										
-8	-19																																									
-3																																										
-9	-20																																									
-4																																										
-10	-21																																									
-5																																										
-11	-22																																									
-6																																										
		-b-	-b-	-b-	ab-	a--	a--	--c	--c	--c	--c	--c																														
G		<table border="1"><tr><td>-99</td><td>-13</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-13	-99		-b-	<table border="1"><tr><td>-13</td><td>-8</td></tr><tr><td>-24</td><td></td></tr></table>	-13	-8	-24		-b-	<table border="1"><tr><td>-8</td><td>-3</td></tr><tr><td>-19</td><td></td></tr></table>	-8	-3	-19		-b-	<table border="1"><tr><td>12</td><td>-14</td></tr><tr><td>-14</td><td></td></tr></table>	12	-14	-14		a--	<table border="1"><tr><td>1</td><td>-15</td></tr><tr><td>1</td><td></td></tr></table>	1	-15	1		--c	<table border="1"><tr><td>-5</td><td>-16</td></tr><tr><td>0</td><td></td></tr></table>	-5	-16	0		--c	<table border="1"><tr><td>-6</td><td>-17</td></tr><tr><td>-1</td><td></td></tr></table>	-6	-17	-1	
-99	-13																																									
-99																																										
-13	-8																																									
-24																																										
-8	-3																																									
-19																																										
12	-14																																									
-14																																										
1	-15																																									
1																																										
-5	-16																																									
0																																										
-6	-17																																									
-1																																										
		-b-	-b-	-b-	-b-	-b-	a--	a--	a-c	a-c	--c	--c																														
A		<table border="1"><tr><td>-99</td><td>-14</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-14	-99		-b-	<table border="1"><tr><td>-9</td><td>-9</td></tr><tr><td>-25</td><td></td></tr></table>	-9	-9	-25		ab-	<table border="1"><tr><td>-4</td><td>-4</td></tr><tr><td>-20</td><td></td></tr></table>	-4	-4	-20		ab-	<table border="1"><tr><td>-4</td><td>1</td></tr><tr><td>-15</td><td></td></tr></table>	-4	1	-15		-b-	<table border="1"><tr><td>11</td><td>-10</td></tr><tr><td>-10</td><td></td></tr></table>	11	-10	-10		a--	<table border="1"><tr><td>0</td><td>-11</td></tr><tr><td>0</td><td></td></tr></table>	0	-11	0		--c	<table border="1"><tr><td>-1</td><td>-12</td></tr><tr><td>-1</td><td></td></tr></table>	-1	-12	-1	
-99	-14																																									
-99																																										
-9	-9																																									
-25																																										
-4	-4																																									
-20																																										
-4	1																																									
-15																																										
11	-10																																									
-10																																										
0	-11																																									
0																																										
-1	-12																																									
-1																																										
		-b-	-b-	-b-	ab-	-b-	ab-	-b-	-b-	a--	a--	a-c																														
C		<table border="1"><tr><td>-99</td><td>-15</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-15	-99		-b-	<table border="1"><tr><td>-15</td><td>-10</td></tr><tr><td>-26</td><td></td></tr></table>	-15	-10	-26		-b-	<table border="1"><tr><td>-10</td><td>-5</td></tr><tr><td>-21</td><td></td></tr></table>	-10	-5	-21		-b-	<table border="1"><tr><td>-5</td><td>0</td></tr><tr><td>-16</td><td></td></tr></table>	-5	0	-16		-b-	<table border="1"><tr><td>0</td><td>0</td></tr><tr><td>-11</td><td></td></tr></table>	0	0	-11		ab-	<table border="1"><tr><td>15</td><td>-11</td></tr><tr><td>-11</td><td></td></tr></table>	15	-11	-11		a--	<table border="1"><tr><td>4</td><td>-12</td></tr><tr><td>4</td><td></td></tr></table>	4	-12	4	
-99	-15																																									
-99																																										
-15	-10																																									
-26																																										
-10	-5																																									
-21																																										
-5	0																																									
-16																																										
0	0																																									
-11																																										
15	-11																																									
-11																																										
4	-12																																									
4																																										
		-b-	-b-	-b-	-b-	-b-	-b-	-b-	-b-	ab-	a--	a--																														
G		<table border="1"><tr><td>-99</td><td>-16</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-16	-99		-b-	<table border="1"><tr><td>-16</td><td>-11</td></tr><tr><td>-27</td><td></td></tr></table>	-16	-11	-27		-b-	<table border="1"><tr><td>-11</td><td>-6</td></tr><tr><td>-22</td><td></td></tr></table>	-11	-6	-22		-b-	<table border="1"><tr><td>-1</td><td>-1</td></tr><tr><td>-17</td><td></td></tr></table>	-1	-1	-17		ab-	<table border="1"><tr><td>4</td><td>-1</td></tr><tr><td>-12</td><td></td></tr></table>	4	-1	-12		a--	<table border="1"><tr><td>-1</td><td>4</td></tr><tr><td>-7</td><td></td></tr></table>	-1	4	-7		-b-	<table border="1"><tr><td>14</td><td>-7</td></tr><tr><td>-7</td><td></td></tr></table>	14	-7	-7	
-99	-16																																									
-99																																										
-16	-11																																									
-27																																										
-11	-6																																									
-22																																										
-1	-1																																									
-17																																										
4	-1																																									
-12																																										
-1	4																																									
-7																																										
14	-7																																									
-7																																										
		-b-	-b-	-b-	-b-	-b-	-b-	ab-	-b-	a--	-b-	-b-																														
A		<table border="1"><tr><td>-99</td><td>-17</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-17	-99		-b-	<table border="1"><tr><td>-12</td><td>-12</td></tr><tr><td>-28</td><td></td></tr></table>	-12	-12	-28		ab-	<table border="1"><tr><td>-7</td><td>-7</td></tr><tr><td>-23</td><td></td></tr></table>	-7	-7	-23		ab-	<table border="1"><tr><td>-7</td><td>-2</td></tr><tr><td>-18</td><td></td></tr></table>	-7	-2	-18		-b-	<table border="1"><tr><td>-2</td><td>-2</td></tr><tr><td>-13</td><td></td></tr></table>	-2	-2	-13		ab-	<table border="1"><tr><td>3</td><td>3</td></tr><tr><td>-13</td><td></td></tr></table>	3	3	-13		ab-	<table border="1"><tr><td>3</td><td>3</td></tr><tr><td>-8</td><td></td></tr></table>	3	3	-8	
-99	-17																																									
-99																																										
-12	-12																																									
-28																																										
-7	-7																																									
-23																																										
-7	-2																																									
-18																																										
-2	-2																																									
-13																																										
3	3																																									
-13																																										
3	3																																									
-8																																										
		-b-	-b-	-b-	ab-	-b-	ab-	-b-	-b-	ab-	-b-	ab-																														
C		<table border="1"><tr><td>-99</td><td>-18</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-18	-99		-b-	<table border="1"><tr><td>-18</td><td>-13</td></tr><tr><td>-29</td><td></td></tr></table>	-18	-13	-29		-b-	<table border="1"><tr><td>-13</td><td>-8</td></tr><tr><td>-24</td><td></td></tr></table>	-13	-8	-24		-b-	<table border="1"><tr><td>-8</td><td>-3</td></tr><tr><td>-19</td><td></td></tr></table>	-8	-3	-19		-b-	<table border="1"><tr><td>-3</td><td>-3</td></tr><tr><td>-14</td><td></td></tr></table>	-3	-3	-14		ab-	<table border="1"><tr><td>2</td><td>2</td></tr><tr><td>-14</td><td></td></tr></table>	2	2	-14		ab-	<table border="1"><tr><td>7</td><td>2</td></tr><tr><td>-9</td><td></td></tr></table>	7	2	-9	
-99	-18																																									
-99																																										
-18	-13																																									
-29																																										
-13	-8																																									
-24																																										
-8	-3																																									
-19																																										
-3	-3																																									
-14																																										
2	2																																									
-14																																										
7	2																																									
-9																																										
		-b-	-b-	-b-	-b-	-b-	-b-	-b-	-b-	ab-	-b-	ab-																														
C		<table border="1"><tr><td>-99</td><td>-19</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-19	-99		-b-	<table border="1"><tr><td>-19</td><td>-14</td></tr><tr><td>-30</td><td></td></tr></table>	-19	-14	-30		-b-	<table border="1"><tr><td>-14</td><td>-9</td></tr><tr><td>-25</td><td></td></tr></table>	-14	-9	-25		-b-	<table border="1"><tr><td>-9</td><td>-4</td></tr><tr><td>-20</td><td></td></tr></table>	-9	-4	-20		-b-	<table border="1"><tr><td>-4</td><td>-4</td></tr><tr><td>-15</td><td></td></tr></table>	-4	-4	-15		ab-	<table border="1"><tr><td>1</td><td>1</td></tr><tr><td>-15</td><td></td></tr></table>	1	1	-15		ab-	<table border="1"><tr><td>6</td><td>1</td></tr><tr><td>-10</td><td></td></tr></table>	6	1	-10	
-99	-19																																									
-99																																										
-19	-14																																									
-30																																										
-14	-9																																									
-25																																										
-9	-4																																									
-20																																										
-4	-4																																									
-15																																										
1	1																																									
-15																																										
6	1																																									
-10																																										

Match = 4
Mismatch = -1
Init gap = -11
Cont. gap = -1

		A	A	G	G	C	C																																			
		<table border="1"><tr><td>0</td><td>-99</td></tr><tr><td>-99</td><td></td></tr></table>	0	-99	-99		a--	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-11</td><td></td></tr></table>	-99	-99	-11		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-12</td><td></td></tr></table>	-99	-99	-12		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-13</td><td></td></tr></table>	-99	-99	-13		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-14</td><td></td></tr></table>	-99	-99	-14		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-15</td><td></td></tr></table>	-99	-99	-15		--c	<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>-16</td><td></td></tr></table>	-99	-99	-16	
0	-99																																									
-99																																										
-99	-99																																									
-11																																										
-99	-99																																									
-12																																										
-99	-99																																									
-13																																										
-99	-99																																									
-14																																										
-99	-99																																									
-15																																										
-99	-99																																									
-16																																										
		a--	a--	--c	--c	--c	--c	--c	--c	--c	--c	--c																														
A		<table border="1"><tr><td>-99</td><td>-11</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-11	-99		-b-	<table border="1"><tr><td>4</td><td>-22</td></tr><tr><td>-22</td><td></td></tr></table>	4	-22	-22		a--	<table border="1"><tr><td>-7</td><td>-23</td></tr><tr><td>-7</td><td></td></tr></table>	-7	-23	-7		--c	<table border="1"><tr><td>-13</td><td>-24</td></tr><tr><td>-8</td><td></td></tr></table>	-13	-24	-8		--c	<table border="1"><tr><td>-14</td><td>-25</td></tr><tr><td>-9</td><td></td></tr></table>	-14	-25	-9		--c	<table border="1"><tr><td>-15</td><td>-26</td></tr><tr><td>-10</td><td></td></tr></table>	-15	-26	-10		--c	<table border="1"><tr><td>-16</td><td>-27</td></tr><tr><td>-11</td><td></td></tr></table>	-16	-27	-11	
-99	-11																																									
-99																																										
4	-22																																									
-22																																										
-7	-23																																									
-7																																										
-13	-24																																									
-8																																										
-14	-25																																									
-9																																										
-15	-26																																									
-10																																										
-16	-27																																									
-11																																										
		-b-	-b-	a--	a--	a-c	a-c	--c	--c	--c	--c	--c																														
C		<table border="1"><tr><td>-99</td><td>-12</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-12	-99		-b-	<table border="1"><tr><td>-12</td><td>-7</td></tr><tr><td>-23</td><td></td></tr></table>	-12	-7	-23		-b-	<table border="1"><tr><td>3</td><td>-18</td></tr><tr><td>-18</td><td></td></tr></table>	3	-18	-18		a--	<table border="1"><tr><td>-8</td><td>-19</td></tr><tr><td>-8</td><td></td></tr></table>	-8	-19	-8		--c	<table border="1"><tr><td>-9</td><td>-20</td></tr><tr><td>-9</td><td></td></tr></table>	-9	-20	-9		--c	<table border="1"><tr><td>-5</td><td>-21</td></tr><tr><td>-10</td><td></td></tr></table>	-5	-21	-10		--c	<table border="1"><tr><td>-6</td><td>-22</td></tr><tr><td>-11</td><td></td></tr></table>	-6	-22	-11	
-99	-12																																									
-99																																										
-12	-7																																									
-23																																										
3	-18																																									
-18																																										
-8	-19																																									
-8																																										
-9	-20																																									
-9																																										
-5	-21																																									
-10																																										
-6	-22																																									
-11																																										
		-b-	-b-	-b-	-b-	a--	a--	a-c	a-c	a-c	a-c	a--																														
G		<table border="1"><tr><td>-99</td><td>-13</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-13	-99		-b-	<table border="1"><tr><td>-13</td><td>-8</td></tr><tr><td>-24</td><td></td></tr></table>	-13	-8	-24		-b-	<table border="1"><tr><td>-8</td><td>-8</td></tr><tr><td>-19</td><td></td></tr></table>	-8	-8	-19		ab-	<table border="1"><tr><td>7</td><td>-19</td></tr><tr><td>-19</td><td></td></tr></table>	7	-19	-19		a--	<table border="1"><tr><td>-4</td><td>-20</td></tr><tr><td>-4</td><td></td></tr></table>	-4	-20	-4		--c	<table border="1"><tr><td>-10</td><td>-16</td></tr><tr><td>-5</td><td></td></tr></table>	-10	-16	-5		--c	<table border="1"><tr><td>-6</td><td>-17</td></tr><tr><td>-6</td><td></td></tr></table>	-6	-17	-6	
-99	-13																																									
-99																																										
-13	-8																																									
-24																																										
-8	-8																																									
-19																																										
7	-19																																									
-19																																										
-4	-20																																									
-4																																										
-10	-16																																									
-5																																										
-6	-17																																									
-6																																										
		-b-	-b-	-b-	-b-	-b-	ab-	a--	a--	a-c	a-c	--c																														
A		<table border="1"><tr><td>-99</td><td>-14</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-14	-99		-b-	<table border="1"><tr><td>-9</td><td>-9</td></tr><tr><td>-25</td><td></td></tr></table>	-9	-9	-25		ab-	<table border="1"><tr><td>-4</td><td>-9</td></tr><tr><td>-20</td><td></td></tr></table>	-4	-9	-20		a--	<table border="1"><tr><td>-9</td><td>-4</td></tr><tr><td>-15</td><td></td></tr></table>	-9	-4	-15		-b-	<table border="1"><tr><td>6</td><td>-15</td></tr><tr><td>-15</td><td></td></tr></table>	6	-15	-15		a--	<table border="1"><tr><td>-5</td><td>-16</td></tr><tr><td>-5</td><td></td></tr></table>	-5	-16	-5		--c	<table border="1"><tr><td>-6</td><td>-17</td></tr><tr><td>-6</td><td></td></tr></table>	-6	-17	-6	
-99	-14																																									
-99																																										
-9	-9																																									
-25																																										
-4	-9																																									
-20																																										
-9	-4																																									
-15																																										
6	-15																																									
-15																																										
-5	-16																																									
-5																																										
-6	-17																																									
-6																																										
		-b-	-b-	-b-	ab-	-b-	a--	-b-	-b-	a--	a--	a-c																														
C		<table border="1"><tr><td>-99</td><td>-15</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-15	-99		-b-	<table border="1"><tr><td>-15</td><td>-10</td></tr><tr><td>-26</td><td></td></tr></table>	-15	-10	-26		-b-	<table border="1"><tr><td>-10</td><td>-10</td></tr><tr><td>-21</td><td></td></tr></table>	-10	-10	-21		ab-	<table border="1"><tr><td>-5</td><td>-5</td></tr><tr><td>-21</td><td></td></tr></table>	-5	-5	-21		ab-	<table border="1"><tr><td>-5</td><td>-5</td></tr><tr><td>-16</td><td></td></tr></table>	-5	-5	-16		ab-	<table border="1"><tr><td>10</td><td>-16</td></tr><tr><td>-16</td><td></td></tr></table>	10	-16	-16		a--	<table border="1"><tr><td>-1</td><td>-17</td></tr><tr><td>-1</td><td></td></tr></table>	-1	-17	-1	
-99	-15																																									
-99																																										
-15	-10																																									
-26																																										
-10	-10																																									
-21																																										
-5	-5																																									
-21																																										
-5	-5																																									
-16																																										
10	-16																																									
-16																																										
-1	-17																																									
-1																																										
		-b-	-b-	-b-	-b-	-b-	ab-	-b-	ab-	-b-	ab-	a--																														
G		<table border="1"><tr><td>-99</td><td>-16</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-16	-99		-b-	<table border="1"><tr><td>-16</td><td>-11</td></tr><tr><td>-27</td><td></td></tr></table>	-16	-11	-27		-b-	<table border="1"><tr><td>-11</td><td>-11</td></tr><tr><td>-22</td><td></td></tr></table>	-11	-11	-22		ab-	<table border="1"><tr><td>-6</td><td>-6</td></tr><tr><td>-22</td><td></td></tr></table>	-6	-6	-22		ab-	<table border="1"><tr><td>-1</td><td>-6</td></tr><tr><td>-17</td><td></td></tr></table>	-1	-6	-17		a--	<table border="1"><tr><td>-6</td><td>-1</td></tr><tr><td>-12</td><td></td></tr></table>	-6	-1	-12		-b-	<table border="1"><tr><td>9</td><td>-12</td></tr><tr><td>-12</td><td></td></tr></table>	9	-12	-12	
-99	-16																																									
-99																																										
-16	-11																																									
-27																																										
-11	-11																																									
-22																																										
-6	-6																																									
-22																																										
-1	-6																																									
-17																																										
-6	-1																																									
-12																																										
9	-12																																									
-12																																										
		-b-	-b-	-b-	-b-	-b-	ab-	-b-	ab-	-b-	a--	-b-																														
A		<table border="1"><tr><td>-99</td><td>-17</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-17	-99		-b-	<table border="1"><tr><td>-12</td><td>-12</td></tr><tr><td>-28</td><td></td></tr></table>	-12	-12	-28		ab-	<table border="1"><tr><td>-7</td><td>-12</td></tr><tr><td>-23</td><td></td></tr></table>	-7	-12	-23		a--	<table border="1"><tr><td>-12</td><td>-7</td></tr><tr><td>-18</td><td></td></tr></table>	-12	-7	-18		-b-	<table border="1"><tr><td>-7</td><td>-7</td></tr><tr><td>-18</td><td></td></tr></table>	-7	-7	-18		ab-	<table border="1"><tr><td>-2</td><td>-2</td></tr><tr><td>-18</td><td></td></tr></table>	-2	-2	-18		ab-	<table border="1"><tr><td>-2</td><td>-2</td></tr><tr><td>-13</td><td></td></tr></table>	-2	-2	-13	
-99	-17																																									
-99																																										
-12	-12																																									
-28																																										
-7	-12																																									
-23																																										
-12	-7																																									
-18																																										
-7	-7																																									
-18																																										
-2	-2																																									
-18																																										
-2	-2																																									
-13																																										
		-b-	-b-	-b-	ab-	-b-	a--	-b-	-b-	-b-	ab-	-b-																														
C		<table border="1"><tr><td>-99</td><td>-18</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-18	-99		-b-	<table border="1"><tr><td>-18</td><td>-13</td></tr><tr><td>-29</td><td></td></tr></table>	-18	-13	-29		-b-	<table border="1"><tr><td>-13</td><td>-13</td></tr><tr><td>-24</td><td></td></tr></table>	-13	-13	-24		ab-	<table border="1"><tr><td>-8</td><td>-8</td></tr><tr><td>-24</td><td></td></tr></table>	-8	-8	-24		ab-	<table border="1"><tr><td>-8</td><td>-8</td></tr><tr><td>-19</td><td></td></tr></table>	-8	-8	-19		ab-	<table border="1"><tr><td>-3</td><td>-3</td></tr><tr><td>-19</td><td></td></tr></table>	-3	-3	-19		ab-	<table border="1"><tr><td>2</td><td>-3</td></tr><tr><td>-14</td><td></td></tr></table>	2	-3	-14	
-99	-18																																									
-99																																										
-18	-13																																									
-29																																										
-13	-13																																									
-24																																										
-8	-8																																									
-24																																										
-8	-8																																									
-19																																										
-3	-3																																									
-19																																										
2	-3																																									
-14																																										
		-b-	-b-	-b-	-b-	-b-	ab-	-b-	ab-	-b-	ab-	-b-																														
G		<table border="1"><tr><td>-99</td><td>-19</td></tr><tr><td>-99</td><td></td></tr></table>	-99	-19	-99		-b-	<table border="1"><tr><td>-19</td><td>-14</td></tr><tr><td>-30</td><td></td></tr></table>	-19	-14	-30		-b-	<table border="1"><tr><td>-14</td><td>-14</td></tr><tr><td>-25</td><td></td></tr></table>	-14	-14	-25		ab-	<table border="1"><tr><td>-9</td><td>-9</td></tr><tr><td>-25</td><td></td></tr></table>	-9	-9	-25		ab-	<table border="1"><tr><td>-4</td><td>-9</td></tr><tr><td>-20</td><td></td></tr></table>	-4	-9	-20		a--	<table border="1"><tr><td>-9</td><td>-4</td></tr><tr><td>-15</td><td></td></tr></table>	-9	-4	-15		-b-	<table border="1"><tr><td>-4</td><td>-4</td></tr><tr><td>-15</td><td></td></tr></table>	-4	-4	-15	
-99	-19																																									
-99																																										
-19	-14																																									
-30																																										
-14	-14																																									
-25																																										
-9	-9																																									
-25																																										
-4	-9																																									
-20																																										
-9	-4																																									
-15																																										
-4	-4																																									
-15																																										

Match = 4
Mismatch = -1
Init gap = -11
Cont. gap = -1

Affine Gap Penalties

So consider this gap penalty function:

The first gap in a contiguous string of gaps costs -3, and each additional gap in that string costs -1.

What is the score of each of these alignments:

ACAGCAGTAT A--G--G-A-	ACAGCAGTAT --AGGA-----
--------------------------	---------------------------

Notice how this notion gives preference to the more natural alignment on the right, similar to the way our semi-global alignment (no charge for end gaps) preferred more natural alignments.

Optimal Affine Gap Penalty Alignment

Let's align ACAGCAGTAT and AGGA under the system:

Match: +1
Mismatch: -1
Start gap: -3
Continue gap: -1

How did we do this with the regular gap penalty?
What could our last column look like?

Either $\begin{bmatrix} T \\ A \end{bmatrix}$, $\begin{bmatrix} T \\ - \end{bmatrix}$ or $\begin{bmatrix} - \\ A \end{bmatrix}$.

What optimal alignments would you like to know?

ACAGCAGTA	ACAGCAGTA	ACAGCAGTAT
AGG	AGGA	AGG
score: -6	score: -4	score: -7

What is the optimal cost?

We Need to keep More Information

Align ACAGCAGTAT and AGGA

Match: +1

Mismatch: -1

Start gap: -3

Continue gap: -1

The last column is either $\begin{bmatrix} T \\ A \end{bmatrix}$, $\begin{bmatrix} T \\ - \end{bmatrix}$ or $\begin{bmatrix} - \\ A \end{bmatrix}$.

Here are the optimal alignments of some pairs of prefixes with each of *their* possible last columns:

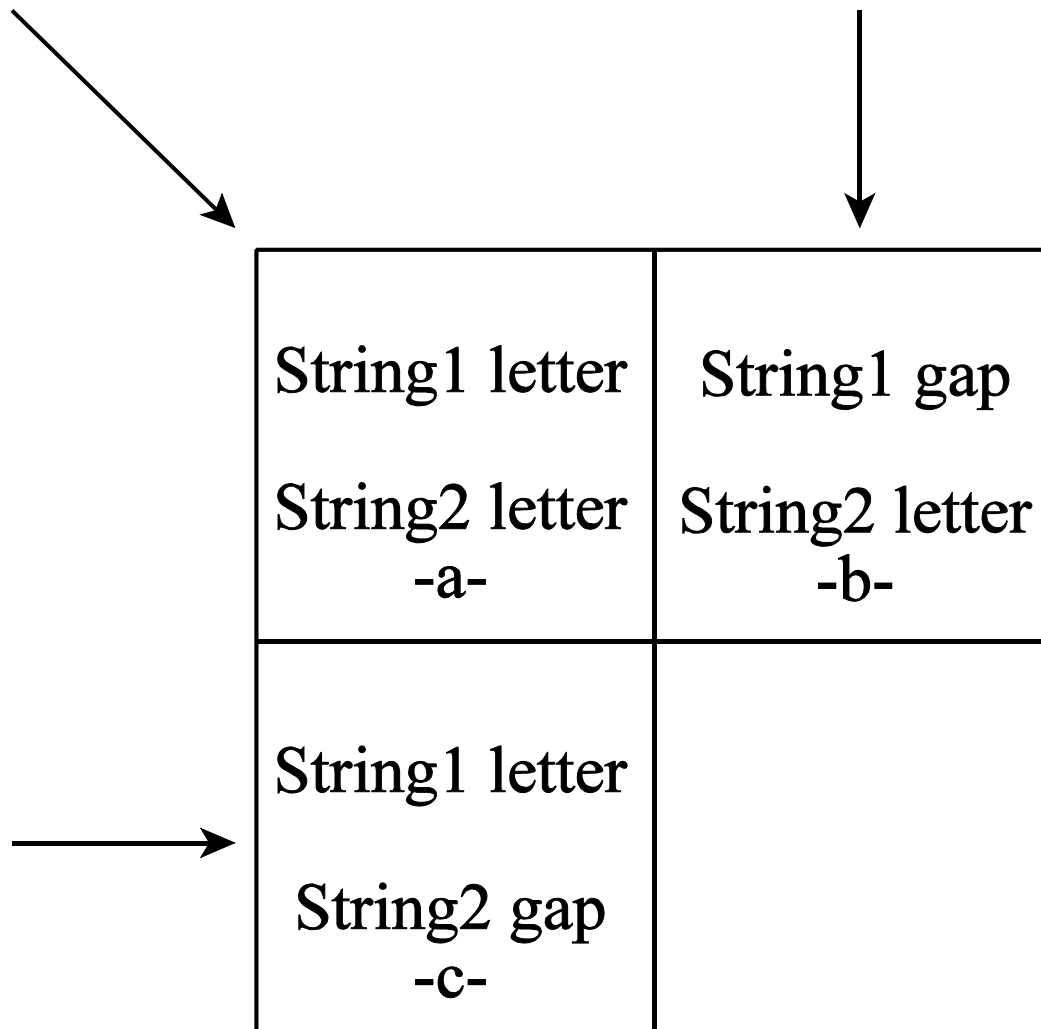
ACAGCAGTA AGG			ACAGCAGTA AGGA			ACAGCAGTAT AGG		
A	A	-	A	A	-	T	T	-
G	-	G	A	-	A	G	-	G
-7	-6	-9	-4	-5	-8	-8	-7	-10

Now can you tell me the optimal alignment?

A More Interesting Matrix

For the optimal alignment of each pair of prefixes, we need to keep track of its optimal alignment for each possible last column.

Each entry of the matrix becomes three entries, one for each direction into that cell.



A Simple Affine Gap Alignment

		A	C
G			
A			
T			

A Simple Affine Gap Alignment

			A		C						
			0	-99		-99	-99			-99	-99
		a--	-99			-3		--c		-4	
	a--	a--			--c			--c		--c	
G			-99	-3		-1	-6			-4	-7
		-b-	-99			-6		a--		-4	
	-b-	-b-			a--			a--		a-c	
A			-99	-4		-2	-4			-2	-7
		-b-	-99			-7		a--		-5	
	-b-	-b-			ab-			a--		a--	
T			-99	-5		-5	-5			-3	-5
		-b-	-99			-8		ab-		-8	

Slightly More Interesting

		A	T	G																	
		<table border="1"><tr><td>0</td><td>-99</td></tr><tr><td>-99</td><td></td></tr></table>	0	-99	-99		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>0</td><td></td></tr></table>	-99	-99	0		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>0</td><td></td></tr></table>	-99	-99	0		<table border="1"><tr><td>-99</td><td>-99</td></tr><tr><td>0</td><td></td></tr></table>	-99	-99	0	
0	-99																				
-99																					
-99	-99																				
0																					
-99	-99																				
0																					
-99	-99																				
0																					
	a--	a--	--c	--c																	
	a--	a--	--c	--c	--c	--c															
C	<table border="1"><tr><td>-99</td><td>0</td></tr><tr><td>-99</td><td></td></tr></table>	-99	0	-99		<table border="1"><tr><td>-1</td><td>-3</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-3	-3		<table border="1"><tr><td>-1</td><td>-3</td></tr><tr><td>-4</td><td></td></tr></table>	-1	-3	-4		<table border="1"><tr><td>-1</td><td>-3</td></tr><tr><td>-4</td><td></td></tr></table>	-1	-3	-4		
-99	0																				
-99																					
-1	-3																				
-3																					
-1	-3																				
-4																					
-1	-3																				
-4																					
	-b-	-b-	ab-	a--	ab-	a--	ab-														
T	<table border="1"><tr><td>-99</td><td>0</td></tr><tr><td>-99</td><td></td></tr></table>	-99	0	-99		<table border="1"><tr><td>-1</td><td>-4</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-4	-3		<table border="1"><tr><td>0</td><td>-4</td></tr><tr><td>-4</td><td></td></tr></table>	0	-4	-4		<table border="1"><tr><td>-2</td><td>-4</td></tr><tr><td>-3</td><td></td></tr></table>	-2	-4	-3		
-99	0																				
-99																					
-1	-4																				
-3																					
0	-4																				
-4																					
-2	-4																				
-3																					
	-b-	-b-	a--	a--	a--	a--	ab-														
T	<table border="1"><tr><td>-99</td><td>0</td></tr><tr><td>-99</td><td></td></tr></table>	-99	0	-99		<table border="1"><tr><td>-1</td><td>-4</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-4	-3		<table border="1"><tr><td>0</td><td>-3</td></tr><tr><td>-4</td><td></td></tr></table>	0	-3	-4		<table border="1"><tr><td>-1</td><td>-5</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-5	-3		
-99	0																				
-99																					
-1	-4																				
-3																					
0	-3																				
-4																					
-1	-5																				
-3																					
	-b-	-b-	a--	a--	a--	a--	a--														
A	<table border="1"><tr><td>-99</td><td>0</td></tr><tr><td>-99</td><td></td></tr></table>	-99	0	-99		<table border="1"><tr><td>1</td><td>-4</td></tr><tr><td>-3</td><td></td></tr></table>	1	-4	-3		<table border="1"><tr><td>-2</td><td>-3</td></tr><tr><td>-2</td><td></td></tr></table>	-2	-3	-2		<table border="1"><tr><td>-1</td><td>-4</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-4	-3		
-99	0																				
-99																					
1	-4																				
-3																					
-2	-3																				
-2																					
-1	-4																				
-3																					
	-b-	-b-	a--	a--	-b-	a-c	a--														
G	<table border="1"><tr><td>-99</td><td>0</td></tr><tr><td>-99</td><td></td></tr></table>	-99	0	-99		<table border="1"><tr><td>-1</td><td>-2</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-2	-3		<table border="1"><tr><td>0</td><td>-4</td></tr><tr><td>-4</td><td></td></tr></table>	0	-4	-4		<table border="1"><tr><td>-1</td><td>-4</td></tr><tr><td>-3</td><td></td></tr></table>	-1	-4	-3		
-99	0																				
-99																					
-1	-2																				
-3																					
0	-4																				
-4																					
-1	-4																				
-3																					
	-b-	-b-	a-c	a--	a--	a--	a--														