	X	A	T	G
Y	.	.	.	.
G	.	.	.	.
G	.	.	.	.
A	.	.	.	.
A	.	.	.	.
T	.	.	.	.
G	.	.	.	.
G	.	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	**0** →	. →	. →	.
G	.	. →	. →	.
G	.	. →	. →	.
A	.	. →	. →	.
A	.	. →	. →	.
T	.	. →	. →	.
G	.	. →	. →	.
G	.	. →	. →	.

Match   = 3
Mismatch   = -1
Gap   = -2

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	.	.
G	.	.	.	.
G	.	.	.	.
A	.	.	.	.
A	.	.	.	.
T	.	.	.	.
G	.	.	.	.
G	.	.	.	.

	X	A	T	G
Y	0	-2	-4	.
G		.	.	.	.
G		.	.	.	.
A		.	.	.	.
A		.	.	.	.
T		.	.	.	.
G		.	.	.	.
G		.	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	.	.	.	.
G	.	.	.	.
A	.	.	.	.
A	.	.	.	.
T	.	.	.	.
G	.	.	.	.
G	.	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	.	.	.
G	.	.	.	.
A	.	.	.	.
A	.	.	.	.
T	.	.	.	.
G	.	.	.	.
G	.	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	.	.	.
G	-4	.	.	.
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	.	.
G	-4	.	.	.
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match   = 3
Mismatch   = -1
Gap   = -2

X	A	T	G
Y	0 → -2 → -4 → -6		
G	-2	-1 → -3	.
G	-4	.	.	.
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match   = 3
Mismatch   = -1
Gap   = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	.	.	.
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	.	.
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	-2	-1 → -3	-1	
G	-4	-3	-2	.
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	-2	-1 → -3	-1	
G	-4	-3	-2	0
A	-6	.	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match   = 3
Mismatch   = -1
Gap   = -2

	X	A	T	G
Y	0 →	-2 →	-4 →	-6
G	-2	-1 →	-3	-1
G	-4	-3	-2	0
A	-6	-1	.	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match   = 3
Mismatch   = -1
Gap   = -2

X		A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	.
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

X		A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	.	.	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	-2 → -1 → -3			-1
G	-4	-3 → -2		0
A	-6 → -1 → -3			-2
A	-8 → -3	.	.	
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3

Mismatch = -1

Gap = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	-2	-1 → -3	-1	
G	-4	-3	-2	0
A	-6	-1 → -3	-2	
A	-8	-3	-2	.
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	.	.	.
G	-12	.	.	.
G	-14	.	.	.

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	.	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	.
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	.	.	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	-2 → -1 → -3 → -1			
G	-4 → -3 → -2 → 0			
A	-6 → -1 → -3 → -2			
A	-8 → -3 → -2 → -4			
T	-10 → -5 → 0 → -2			
G	-12 → -7 → . → .			
G	-14 → . → . → .			

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	.
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	.	.	.

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	.	.

Match   = 3
Mismatch   = -1
Gap   = -2

	X	A	T	G
Y	0 → -2 → -4 → -6			
G	-2 → -1 → -3 → -1			
G	-4 → -3 → -2 → 0			
A	-6 → -1 → -3 → -2			
A	-8 → -3 → -2 → -4			
T	-10 → -5 → 0 → -2			
G	-12 → -7 → -2 → 3			
G	-14 → -9 → -4 → .			

Match = 3
Mismatch = -1
Gap = -2

X		A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match   = 3
Mismatch   = -1
Gap   = -2

Match = 3
Mismatch = -1
Gap = -2

Alignment Score = 1

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match = 3
Mismatch = -1
Gap = -2

Alignment Score = 1

Alignment Score = 1

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match = 3
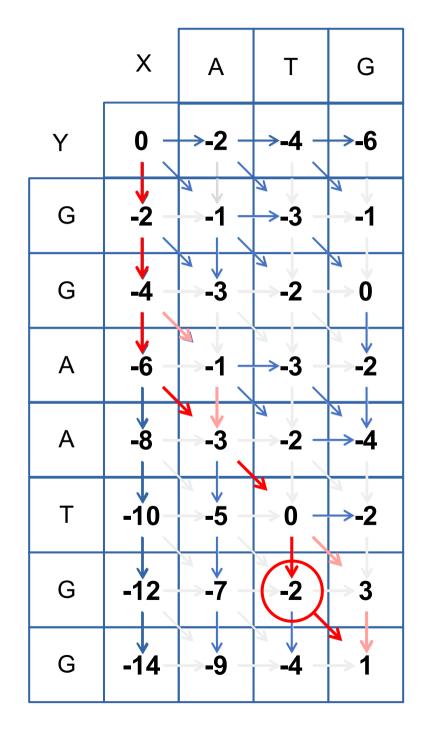Mismatch = -1
Gap = -2

Alignment Score = 1

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match = 3
Mismatch = -1
Gap = -2

X: G
Y: G

Alignment Score = 1

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match = 3
Mismatch = -1
Gap = -2

X: –G
Y: GG

Alignment Score = 1

X	A	T	G
Y			

Match = 3
Mismatch = -1
Gap = -2

X: T–G
Y: TGG

Alignment Score = 1

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match = 3
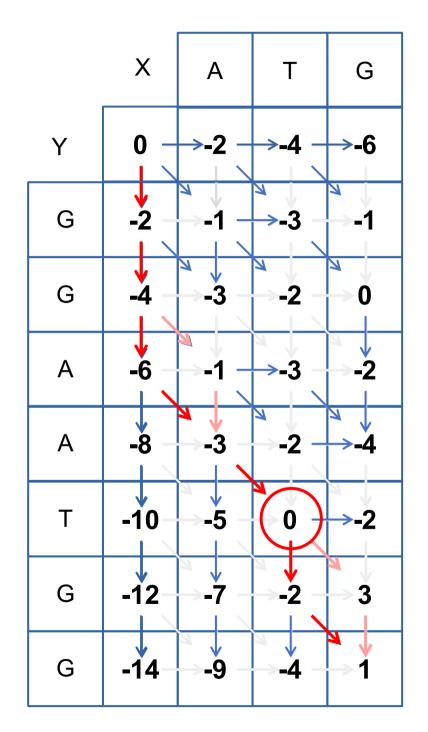Mismatch = -1
Gap = -2

X: AT–G
Y: ATGG

Alignment Score = 1

Match = 3
Mismatch = -1
Gap = -2

X: −AT−G
Y: AATGG

Alignment Score = 1

	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match = 3
Mismatch = -1
Gap = -2

X: −−AT−G
Y: GAATGG

Alignment Score = 1

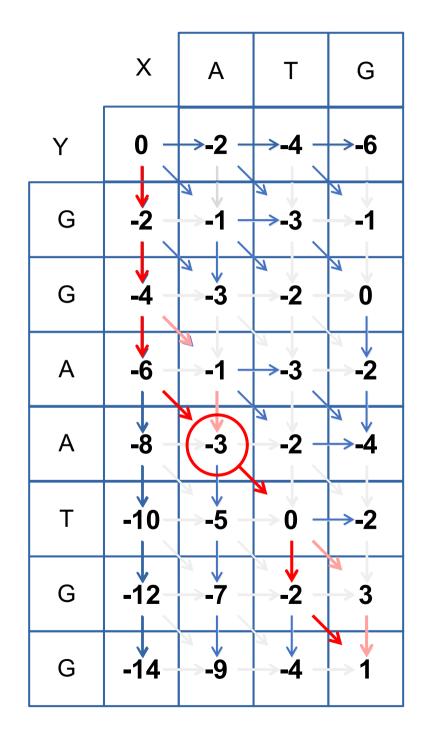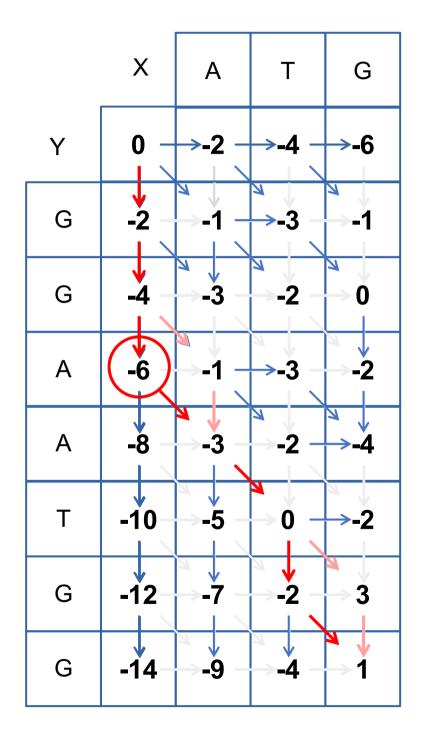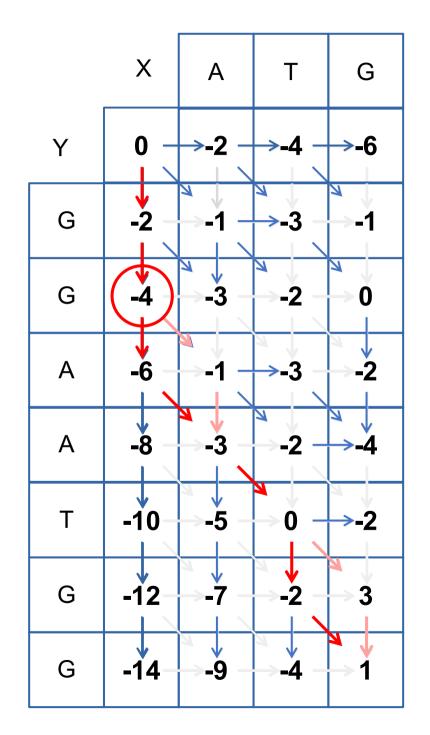|	X	A	T	G
Y	0	-2	-4	-6
G	-2	-1	-3	-1
G	-4	-3	-2	0
A	-6	-1	-3	-2
A	-8	-3	-2	-4
T	-10	-5	0	-2
G	-12	-7	-2	3
G	-14	-9	-4	1

Match   = 3
Mismatch   = -1
Gap   = -2

X: ---AT-G
Y: GGAATGG

Alignment Score = 1

Match = 3
Mismatch = -1
Gap = -2

	X	A	T	G
Y	0	0	0	0
G	0	0	0	3
G	0	0	0	3
A	0	3	1	1
A	0	3	2	0
T	0	1	6	4
G	0	0	4	9
G	0	0	2	7

X: ATG
Y: ATG