Smith-Waterman Unit Tests

Hint: Many test values are taken from project Algorithms
        for Bioninformatics of Alexander Mattheis or the lectures.

Smith-Waterman

Test 1

Input

Sequence A: AACG
Sequence B: AATCG

Deletion: -2
Insertion: -2
Match: 1
Mismatch: -1

Output

		A	A	C	G
	0	0	0	0	0
A	0	1	1	0	0
A	0	1	2	0	0
T	0	0	0	1	0
C	0	0	0	1	0
G	0	0	0	0	2

Seq1   AA   Seq1   CG
        **   **
Seq2   AA   Seq2   CG

Test 2

Input

Sequence A: TACGCAGA
Sequence B: TCCGA

Deletion: -1
Insertion: -1
Match: 1
Mismatch: 0

Output

		T	A	C	G	C	A	C	A
	0	0	0	0	0	0	0	0	0
T	0	1	0	0	0	0	0	0	0
C	0	0	1	1	0	1	0	0	0
C	0	0	0	2	1	1	1	0	0
G	0	0	0	1	3	2	1	2	1
A	0	0	1	0	2	3	3	2	3

TACG
*|**
TCCG

		T	A	C	G	C	A	C	A
	0	0	0	0	0	0	0	0	0
T	0	1	0	0	0	0	0	0	0
C	0	0	1	1	0	1	0	0	0
C	0	0	0	2	1	1	1	0	0
G	0	0	0	1	3	2	1	2	1
A	0	0	1	0	2	3	3	2	3

```
TACGC
*|**|
TCCGA
```

		T	A	C	G	C	A	G	A
	0	0	0	0	0	0	0	0	0
T	0	1	0	0	0	0	0	0	0
C	0	0	1	1	0	1	0	0	0
C	0	0	0	2	1	1	1	0	0
G	0	0	0	1	3	2	1	2	1
A	0	0	1	0	2	3	3	2	3

```
TACGCA
*|** *
TCCG_A
```

		T	A	C	G	C	A	G	A
	0	0	0	0	0	0	0	0	0
T	0	1	0	0	0	0	0	0	0
C	0	0	1	1	0	1	0	0	0
C	0	0	0	2	1	1	1	0	0
G	0	0	0	1	3	2	1	2	1
A	0	0	1	0	2	3	3	2	3

```
CAGA
*|**
CCGA
```

Test 3

Input

```
Sequence A:        CCCCGCGACTCGGGTTCAAGGG
Sequence B:        GGGTGAGACCCCAGTTCAACCC

Deletion:          -2
Insertion:         -2
Match:              4
Mismatch:          -1
```

Output

		C	C	C	C	G	C	G	A	C	T	C	G	G	G	T	T	C	A	A	G	G	G
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	4	2	4	2	0	0	0	4	4	4	2	0	0	0	0	4	4	4
G	0	0	0	0	0	4	3	6	4	2	0	0	4	8	8	6	4	2	0	0	4	8	8
G	0	0	0	0	0	4	3	7	5	3	1	0	4	8	12	10	8	6	4	2	4	8	12
T	0	0	0	0	0	2	3	5	6	4	7	5	3	6	10	16	14	12	10	8	6	6	10
G	0	0	0	0	0	4	2	7	5	5	5	6	9	7	10	14	15	13	11	9	12	10	10
A	0	0	0	0	0	2	3	5	11	9	7	5	7	8	8	12	13	14	17	15	13	11	9
G	0	0	0	0	0	4	2	7	9	10	8	6	9	11	12	10	11	12	15	16	19	17	15
A	0	0	0	0	0	2	3	5	11	9	9	7	7	9	10	11	9	10	16	19	17	18	16
C	0	4	4	4	4	2	6	4	9	15	13	13	11	9	8	9	10	13	14	17	18	16	17
C	0	4	8	8	8	6	6	5	7	13	14	17	15	13	11	9	8	14	12	15	16	17	15
C	0	4	8	12	12	10	10	8	6	11	12	18	16	14	12	10	8	12	13	13	14	15	16
C	0	4	8	12	16	14	14	12	10	10	10	16	17	15	13	11	9	12	11	12	12	13	14
A	0	2	6	10	14	15	13	13	16	14	12	14	15	16	14	12	10	10	16	15	13	11	12
G	0	0	4	8	12	18	16	17	15	15	13	12	18	19	20	18	16	14	14	15	19	17	15
T	0	0	2	6	10	16	17	15	16	14	19	17	16	17	18	24	22	20	18	16	17	18	16
T	0	0	0	4	8	14	15	16	14	15	18	18	16	15	16	22	28	26	24	22	20	18	17
C	0	4	4	4	8	12	18	16	15	18	16	22	20	18	16	20	26	32	30	28	26	24	22
A	0	2	3	3	6	10	16	17	20	18	17	20	21	19	17	18	24	30	36	34	32	30	28
A	0	0	1	2	4	8	14	15	21	19	17	18	19	20	18	16	22	28	34	40	38	36	34
C	0	4	4	5	6	6	12	13	19	25	23	21	19	18	19	17	20	26	32	38	39	37	35
C	0	4	8	8	9	7	10	11	17	23	24	27	25	23	21	19	18	24	30	36	37	38	36
C	0	4	8	12	12	10	11	9	15	21	22	28	26	24	22	20	18	22	28	34	35	36	37

```
Seq1     GCGACTCGGGTTCAA
         *|***|*||******
Seq2     GAGACCCCAGTTCAA
```