

TDA507

Assignment 1: Sequence Alignment

Hugo Manuel Alves Henriques e Silva

hugoalv@student.chalmers.se

Output of questions 1, 2 and 3 (global_alignment.c)

```
./global_alignment
```

```
Score matrix:
```

		A	T	A	C	G	T
	0	-2	-4	-6	-8	-10	-12
A	-2	2	0	-2	-4	-6	-8
T	-4	0	4	2	0	-2	-4
C	-6	-2	2	3	4	2	0
G	-8	-4	0	1	2	6	4
A	-10	-6	-2	2	0	4	5
T	-12	-8	-4	0	1	2	6

```
AT-CGAT
```

```
|| || |
```

```
ATACG-T
```

```
Percent identity: 71.43%
```

```
Hamming distance: 2
```

Output of question 4 (local_alignment.c)

```
./local_alignment
```

```
Score matrix:
```

		H	D	A	G	A	W	G	H	E	Q
P	0	0	0	0	0	0	0	0	0	0	0
A	0	0	0	2	0	2	0	0	0	0	0
W	0	0	0	0	1	0	4	2	0	0	0
H	0	2	0	0	0	0	2	3	4	2	0
E	0	0	1	0	0	0	0	1	2	6	4
A	0	0	0	3	1	2	0	0	0	4	5
E	0	0	0	1	2	0	1	0	0	2	3

```
alignment_length: 5
```

```
AW-HE
```

```
|| ||
```

```
AWGHE
```

```
Percent identity: 80.00%
```

```
Hamming distance: 1
```

Output for question 5 (levenshtein.c)

```
./levenshtein
```

```
Score matrix:
```

		A	T	A	C	G	T
	0	-2	-4	-6	-8	-10	-12
A	-2	2	0	-2	-4	-6	-8
T	-4	0	4	2	0	-2	-4
C	-6	-2	2	3	4	2	0
G	-8	-4	0	1	2	6	4
A	-10	-6	-2	2	0	4	5
T	-12	-8	-4	0	1	2	6

```
AT-CGAT
```

```
|| || |
```

```
ATACG-T
```

```
Percent identity: 71.43%
```

```
X: ATCGAT
```

```
Y: ATACGT
```

```
Levenshtein distance between initial strings X and Y: 2
```

```
Levenshtein distance between aligned sequences: 2
```

Output for questions 6 and 7 (6_and_7.c)

./6_and_7

Score matrix:

		A	T	T	T	T	A
	0	-2	-4	-6	-8	-10	-12
A	-2	2	0	-2	-4	-6	-8
T	-4	0	4	2	0	-2	-4
T	-6	-2	2	6	4	2	0
A	-8	-4	0	4	5	3	4

Number of optimal alignments: 6

Optimal Alignment Number: 1

A--TTA

| |||

ATTTTA

Optimal Alignment Number: 2

A-T-TA

| | ||

ATTTTA

Optimal Alignment Number: 3

AT--TA

|| ||

ATTTTA

Optimal Alignment Number: 4

A-TT-A

| || |

ATTTTA

Optimal Alignment Number: 5

AT-T-A

|| | |

ATTTTA

Optimal Alignment Number: 6

ATT--A

||| |

ATTTTA
