

BURSA TEKNİK ÜNİVERSİTESİ
MÜHENDİSLİK VE DOĞA BİLİMLER FAKÜLTESİ
BİLGİSAYAR MÜHENDİSLİĞİ BİYOİNFORMATİK DERSİ VİZE -PROJE2

✓
7
sn.

[1] `!pip install Biopython==1.78`

Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>
Collecting Biopython==1.78
 Downloading biopython-1.78-cp39-cp39-manylinux1_x86_64.whl (2.3 MB)
 2.3/2.3 MB 24.0 MB/s eta 0:00:00
Requirement already satisfied: numpy in /usr/local/lib/python3.9/dist-packages (from Biopython==1.78) (1.22.4)
Installing collected packages: Biopython
Successfully installed Biopython-1.78

✓
0
sn.


[2] `from Bio import pairwise2`
`alignments = pairwise2.align.globalxx("ACCGT", "ACG")`

✓
0
sn.

[3] `from Bio.pairwise2 import format_alignment`
`print(format_alignment(*alignments[0]))`

```
ACCGT
|  ||
A-CG-
Score=3
```

✓
0
sn.

 `for a in pairwise2.align.globalxx("ACCGT", "ACG"):`
 `print(format_alignment(*a))`

```
ACCGT
|  ||
A-CG-
Score=3
```

```
ACCGT
||  |
AC-G-
Score=3
```

✓
0
sn.

```
[5] for a in pairwise2.align.localxx("ACCGT", "ACG"):  
    print(format_alignment(*a))
```

```
1 ACCG  
  |  ||  
1 A-CG  
  Score=3  
  
1 ACCG  
  ||  |  
1 AC-G  
  Score=3
```

✓
0
sn.

```
[6]  
  
for a in pairwise2.align.localxx("ACCGT", "ACG"):  
    print(format_alignment(*a, full_sequences=True))
```

```
ACCGT  
|  ||  
A-CG-  
  Score=3  
  
ACCGT  
||  |  
AC-G-  
  Score=3
```

✓
0
sn.

```
▶ for a in pairwise2.align.globalmx("ACCGT", "ACG", 2, -1):  
    print(format_alignment(*a))
```

```
▶ ACCGT  
  |  ||  
A-CG-  
  Score=6  
  
ACCGT  
||  |  
AC-G-  
  Score=6
```

✓
0
sn.

```
[8] for a in pairwise2.align.globalms("ACCGT", "ACG", 2, -1, -.5, -.1):  
    print(format_alignment(*a))
```

```
▶ ACCGT  
  |  ||  
A-CG-  
  Score=5  
  
ACCGT  
||  |  
AC-G-  
  Score=5
```

✓
0
sn.

```
[9] for a in pairwise2.align.globalms("A", "T", 5, -4, -1, -.1):  
    print(format_alignment(*a))
```

```
A-  
-T  
Score=-2
```

✓
0
sn.

```
[10] for a in pairwise2.align.globalms("A", "T", 5, -4, -3, -.1):  
    print(format_alignment(*a))
```

```
A  
.  
T  
Score=-4
```

✓
0
sn.



```
from Bio.SubsMat import MatrixInfo as matlist  
matrix = matlist.blosum62  
  
for a in pairwise2.align.globaldx("KEVLA", "EVL", matrix):  
    print(format_alignment(*a))
```

```
KEVLA  
|||  
-EVL-  
Score=13
```

✓
0
sn.

```
[12] from math import log  
def gap_function(x, y): # x is gap position in seq, y is gap length  
    if y == 0: # No gap  
        return 0  
    elif y == 1: # Gap open penalty  
        return -2  
    return - (2 + y/4.0 + log(y)/2.0)  
  
alignment = pairwise2.align.globalmc("ACCCCGT", "ACG", 5, -4, gap_function, gap_function)
```

AÇIKLAMA: İlgili linkteki adımlar google-colab kullanılarak uygulanmıştır.

Hazırlayan: HÜMEYRA ÇİMEN