Pratical 10

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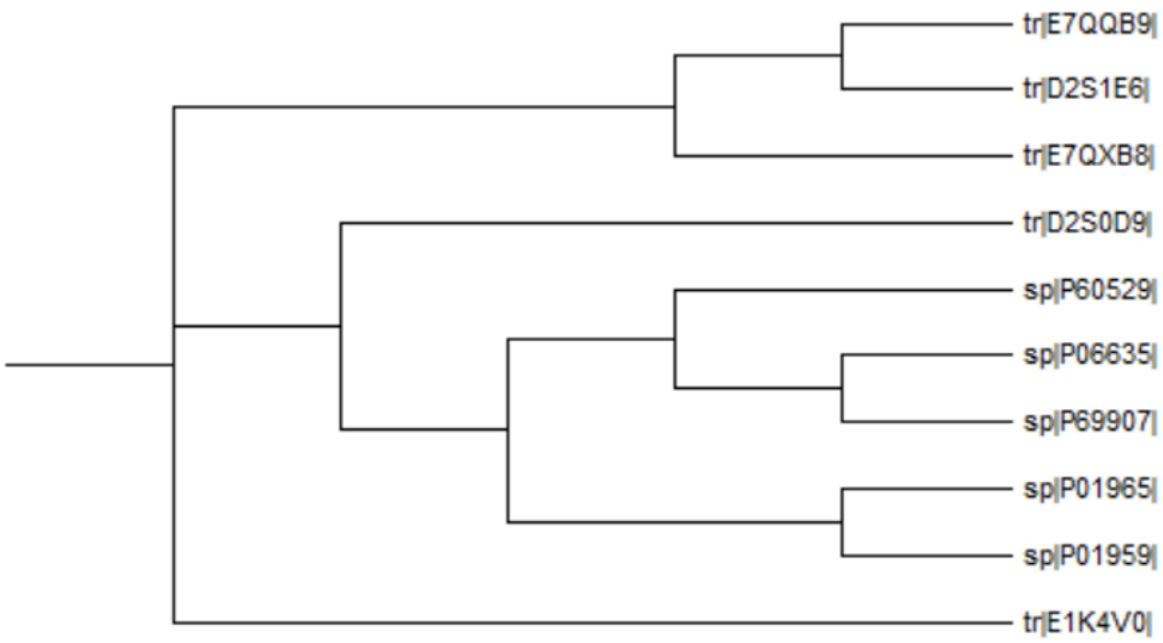
Roll No: BE19B023

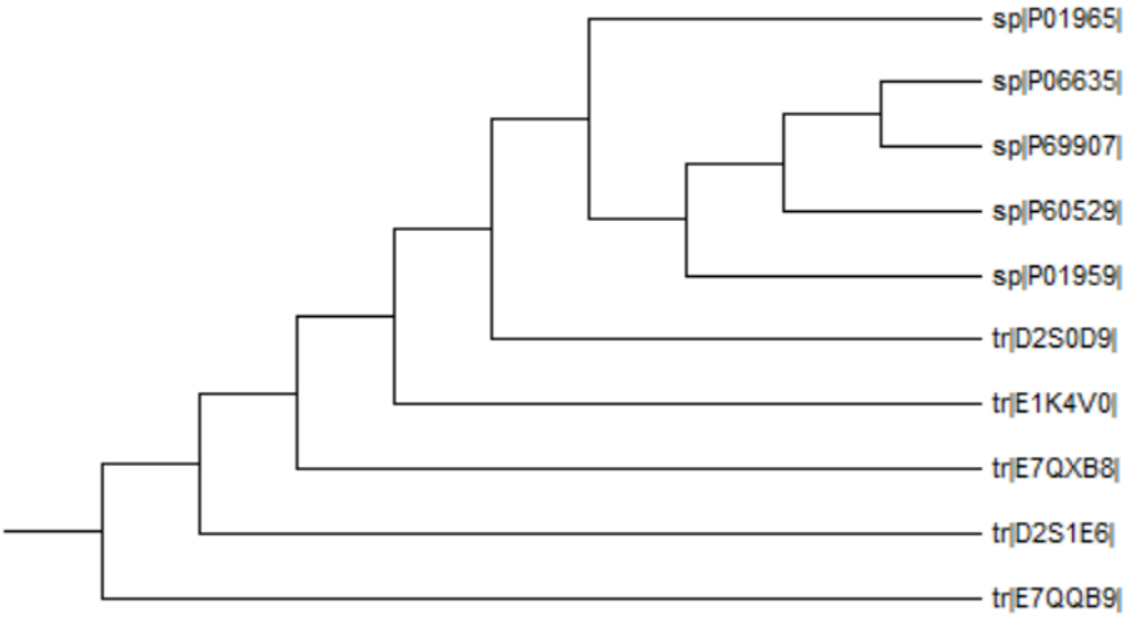
1. For file

   tim.dat-

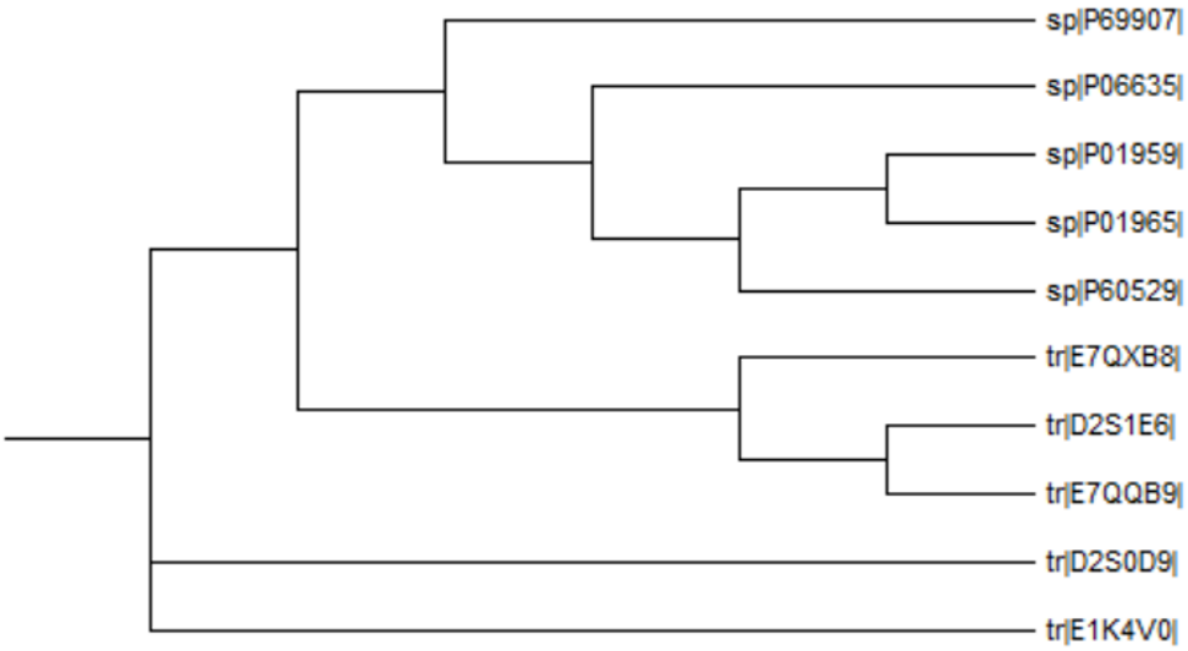
   Outtree obtained from proml:



The output from consense:

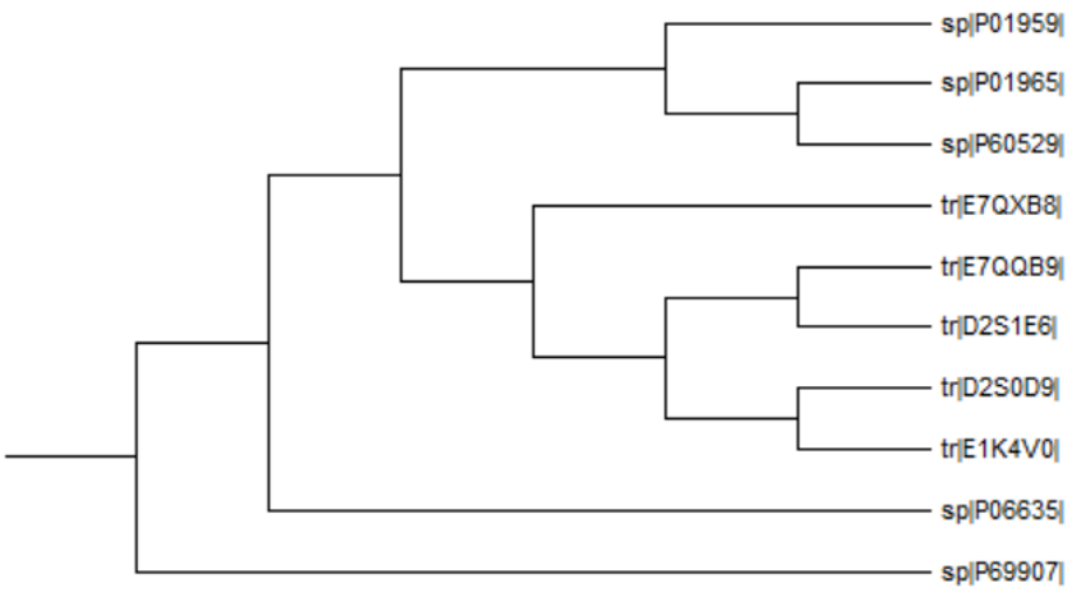


The output from neighbor:



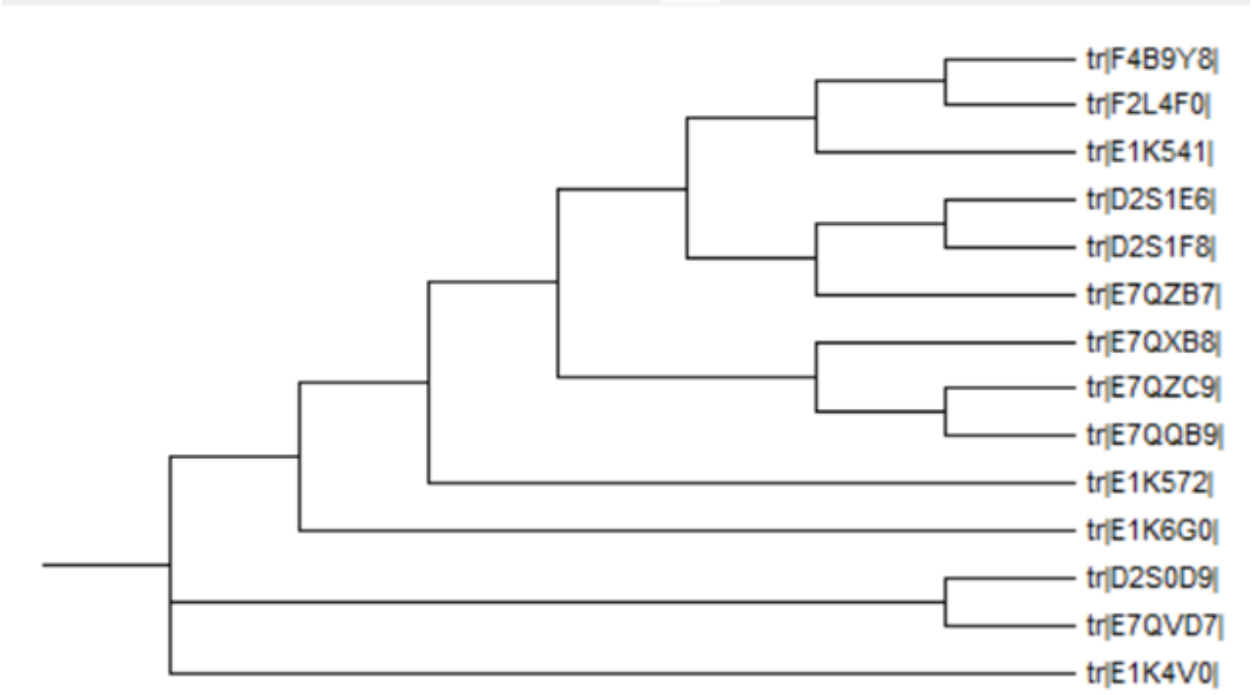
Input file work1-nj-tree:

The output from consense:

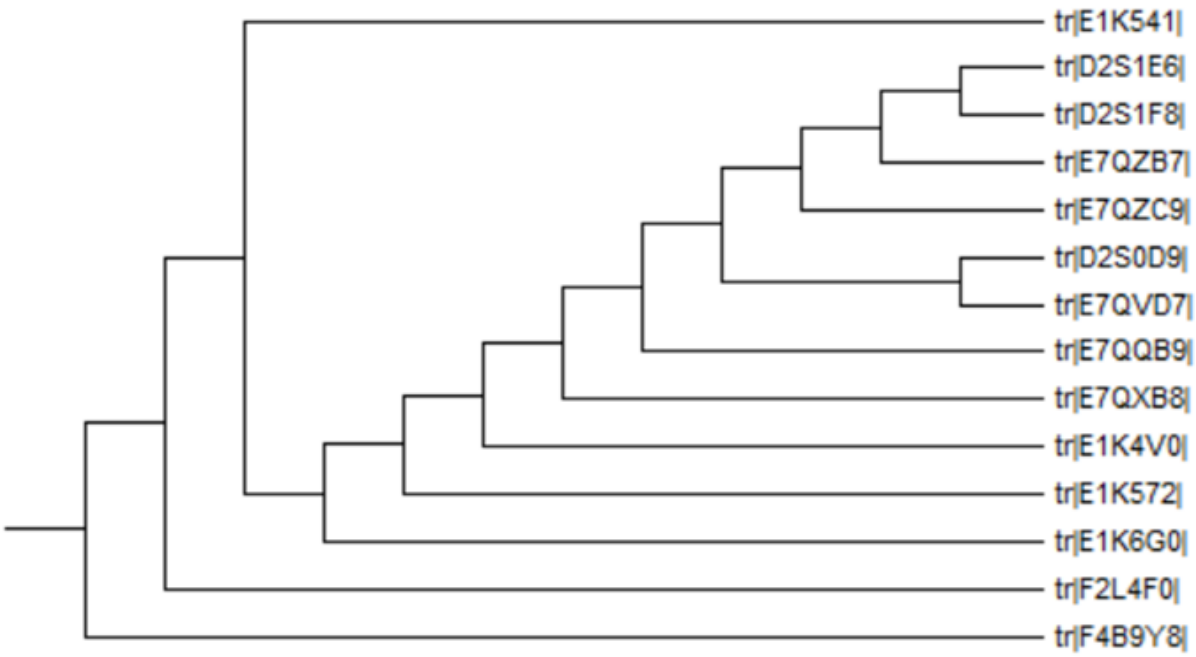


For file **tim.dat.txt**

Output obtained from proml:

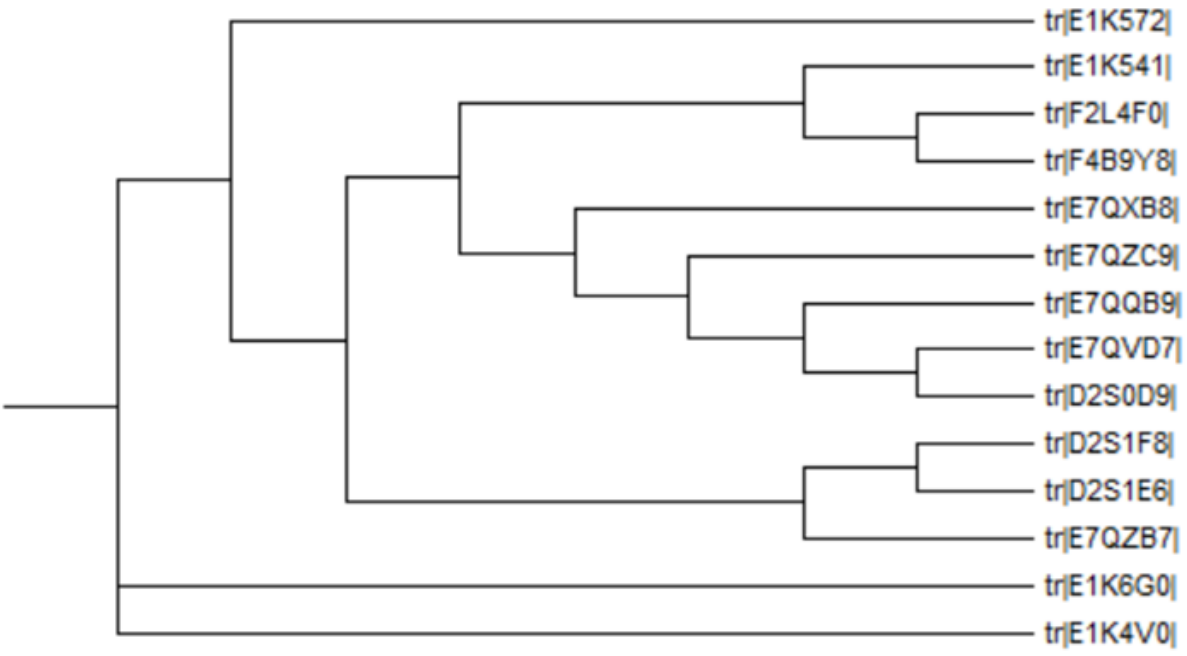


Output from consense:



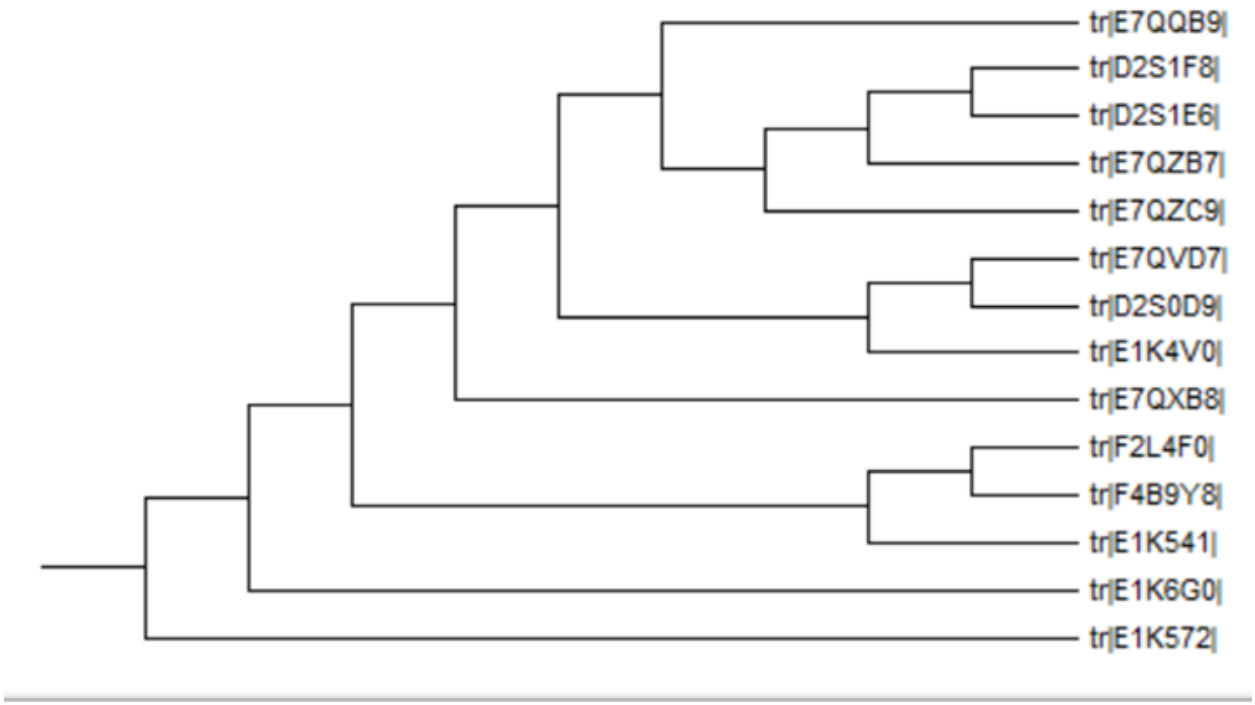
Input file work2-protdist:

The output from neighbor:



Input file work-nj-tree:

The output obtained from consense:



2.

```
import math as m

import pandas as pd

import numpy as np


def Q2(seq):

    AA = ['A', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L','M', 'N', 'P', 'Q', 'R', 'S', 'T', 'V', 'W', 'Y']

    N, L = len(seq), len(seq[0])

    a_m, w_m = [[0 for _ in range(L)] for __ in range(20)], [[0.000 for _ in range(L)] for __ in
range(20)]

    p = [str(_+1) for _ in range(27)]
```

```
    for i in range(N):
        for j in range(L):
            a_m[AA.index(A[i][j])][j] += 1
    data1 = np.array(a_m)

    for k in range(20):
        for l in range(L):
            w_m[k][l] = float('%.2f'%(math.log((a_m[k][l]+0.05)/(0.05 * (N+1)))))
    data2 = np.array(w_m)

    print('Weight Matrix for the given sequences:\nrows ---> amino acids\tand\tcolumns ---> positional occurances')
    print(pd.DataFrame(data2, AA, p))
    return pd.DataFrame(data2, AA, p)



Seq = ['MVLSPADKTNVKGKVGAHAGEYGAAAW',
     'MKRLPADPPCVKGKVKAKAGDYGATTW',
     'MALSAADKTNVKSKVGGHAGEYGAATS',
     'MVLSAADKTNVKSKAGGNAGEWWAAAW',
     'MVLSAADKTNVKSKVLANAGEFGAAAW',
     'ALLPIRTTYHKKCASGHIPEEKDLNNV',
     'DEASSLKGHHIKKLEADALLIPLSASS']
Q2(Seq)
```

	1	2	3	4	5	6	7	8	9	10	...	18	19	20	21	22	23	24	25	26	27
A	0.97	0.97	0.97	-2.08	2.03	2.54	-2.08	-2.08	-2.08	-2.08	...	0.97	2.54	-2.08	-2.08	-2.08	-2.08	2.54	2.54	2.03	-2.08
C	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
D	0.97	-2.08	-2.08	-2.08	-2.08	-2.08	2.54	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	0.97	-2.08	0.97	-2.08	-2.08	-2.08	-2.08
E	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	0.97	2.54	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
F	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	-2.08
G	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	-2.08	-2.08	...	-2.08	-2.08	2.54	-2.08	-2.08	2.32	-2.08	-2.08	-2.08	-2.08
H	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	1.63	...	1.63	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
I	-2.08	-2.08	-2.08	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	-2.08	...	0.97	-2.08	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
K	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	0.97	2.32	-2.08	-2.08	...	0.97	-2.08	-2.08	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	-2.08
L	-2.08	0.97	2.54	0.97	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	...	-2.08	0.97	0.97	-2.08	-2.08	0.97	0.97	-2.08	-2.08	-2.08
M	2.54	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
N	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	2.32	...	1.63	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	0.97	-2.08
P	-2.08	-2.08	-2.08	0.97	1.63	-2.08	-2.08	0.97	0.97	-2.08	...	-2.08	0.97	-2.08	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	-2.08
Q	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
R	-2.08	-2.08	0.97	-2.08	-2.08	0.97	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08
S	-2.08	-2.08	-2.08	2.54	0.97	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	-2.08	0.97	1.63
T	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	0.97	2.32	-2.08	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	1.63	-2.08
V	-2.08	2.03	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97
W	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	...	-2.08	-2.08	-2.08	-2.08	0.97	0.97	-2.08	-2.08	-2.08	2.32
Y	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	-2.08	0.97	-2.08	...	-2.08	-2.08	-2.08	-2.08	2.03	-2.08	-2.08	-2.08	-2.08	-2.08

20 rows × 27 columns