Group27 MATH368 Project1

**Q1**

The best decryption of the ciphertext obtained is:

WHEN I FIND MYSELF IN TIMES OF TROUBLE MOTHER MARY COMES TO ME SPEAKING WORDS OF WISDOM LET IT BE AND IN MY HOUR OF DARKNESS SHE IS STANDING RIGHT IN FRONT OF ME SPEAKING WORDS OF WISDOM LET IT BE LET IT BE LET IT BE LET IT BE LET IT BE WHISPER WORDS OF WISDOM LET IT BE AND WHEN THE BROKEN HEARTED PEOPLE LIVING IN THE WORLD AGREE THERE WILL BE AN ANSWER LET IT BE FOR THOUGH THEY MAY BE PARTED THERE IS STILL A CHANCE THAT THEY WILL SEE THERE WILL BE AN ANSWER LET IT BE LET IT BE LET IT BE LET IT BE LET IT BE YEAH THERE WILL BE AN ANSWER LET IT BE LET IT BE LET IT BE LET IT BE LET IT BE WHISPER WORDS OF WISDOM LET IT BE LET IT BE LET IT BE LET IT BE LET IT BE WHISPER WORDS OF WISDOM LET IT BE AND WHEN THE NIGHT IS CLOUDY THERE IS STILL A LIGHT THAT

The corresponding P(f)= -1087.9 obtained by command *P\_max*

σ^(-1)=(5,4,6,7,1,9,2,3,8) obtained by command *Permu\_max*

**Q2**

To find the least five frequent characters(increasing order)

We already obtained an array of *log\_char\_freq*, we just need to sort it in increasing order and find the corresponding characters.

[b,i]=sort(log\_char\_freq);

fprintf("The increasing order of least frequent characters is: "+alph(i))

Return: QZJXKVBPYGFWCMULDRSHINOATE

Hence, the least five frequent characters are QZJXK

**Q3**

To find the five most frequent transitions(decreasing order)

We already obtained an array of *log\_TransB.*

We use *arr* to store the five biggest values in the matrix *log\_TransB* and then try to locate these five values with their corresponding characters

>> arr=maxk(un(:),5);

>> for j=1:5

[xx(j),yy(j)]=find(un==arr(j));

end;

>> alph(xx)

ans =

'E HTD'

>> alph(yy)

ans =

' TEH '

Q4