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Project 1 Report
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Question 1
The encoded word: MSOKKJCOSXOEEKDTOSLGFWCMCHSUSGX is the decoded word: caesarswifemustbeabovesuspicion
Cypher complete using key: ('k', 's') in 0.046535491943359375 seconds.

Question 2
The encoded word: OOPCULNWFRCFQAQJGPNARMEYUODYOUNRGWORQEPVARCEPBBSCEQYEARAJUYGWWYACYWBPRNEJBMDTEAEYCCFJNENSGWAQRTSJTGXNRQRMDGFEEPHSJRGFCFMACCB is the decoded word: fortunewhichhasagreatdealofpowerinothermattersbutespeciallyinwarcanbringaboutgreatchangesinasituationthroughveryslightforces
Cypher complete using key: ('j', 'a', 'y') in 1.4079530239105225 seconds.

Question 3
The encoded word: MTZHZEOQKASVBDOWMWMKMNYIIHVWPEXJA is the decoded word: experienceistheteacherofallthings
Cypher complete using key: ('i', 'w', 'k', 'd') in 34.46873712539673 seconds.

Question 4
The encoded word: HUETNMIXVTMQWZTQMMZUNZXNSSBLNSJVSJQDLKR is the decoded word: imaginationismoreimportantthanknowledge
Cypher complete using key: ('z', 'i', 'e', 'n', 'f') in 1872.4484009742737 seconds.

Question 5
This question was quite tricky as the version of my program that had been working for all other questions now was crashing due to the space complexity of the key space to try. Thus For this question I had to implement a new version of my program where I was going to make producer and consumer threads wherein the producers add keys to a queue and then consumers take those keys and try and brute force attack. However I was unsuccessful in getting that program stabilized to try it out with.

Notes about Efficiency
In regards to the efficiency of the algorithm, it truly is expressing close to an O(26^N) complexity where N is the size of the key to try and decode with. It was actually really interesting to see just how slow the process became and then at question 5 no longer even possible with the current algorithm.