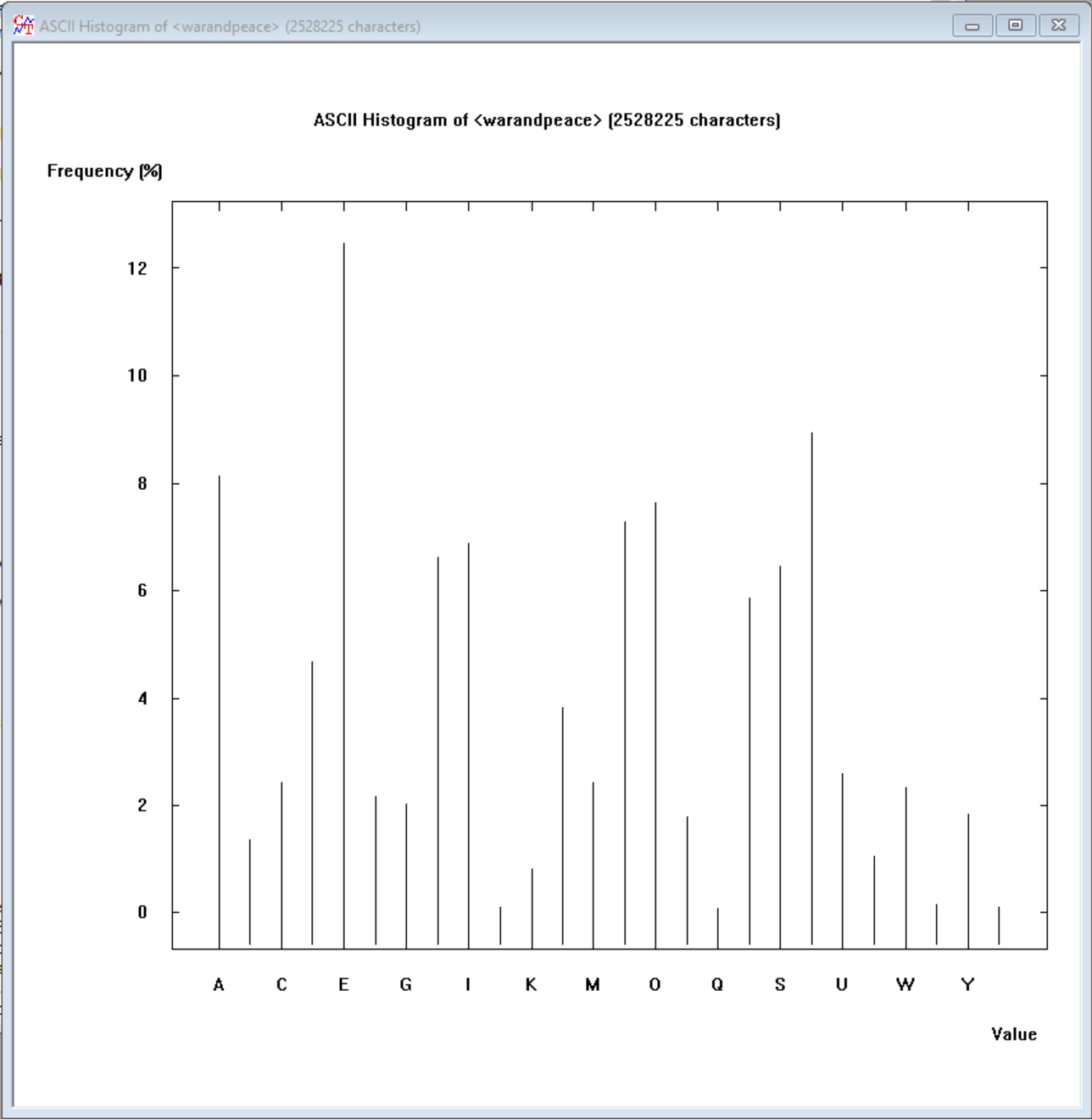
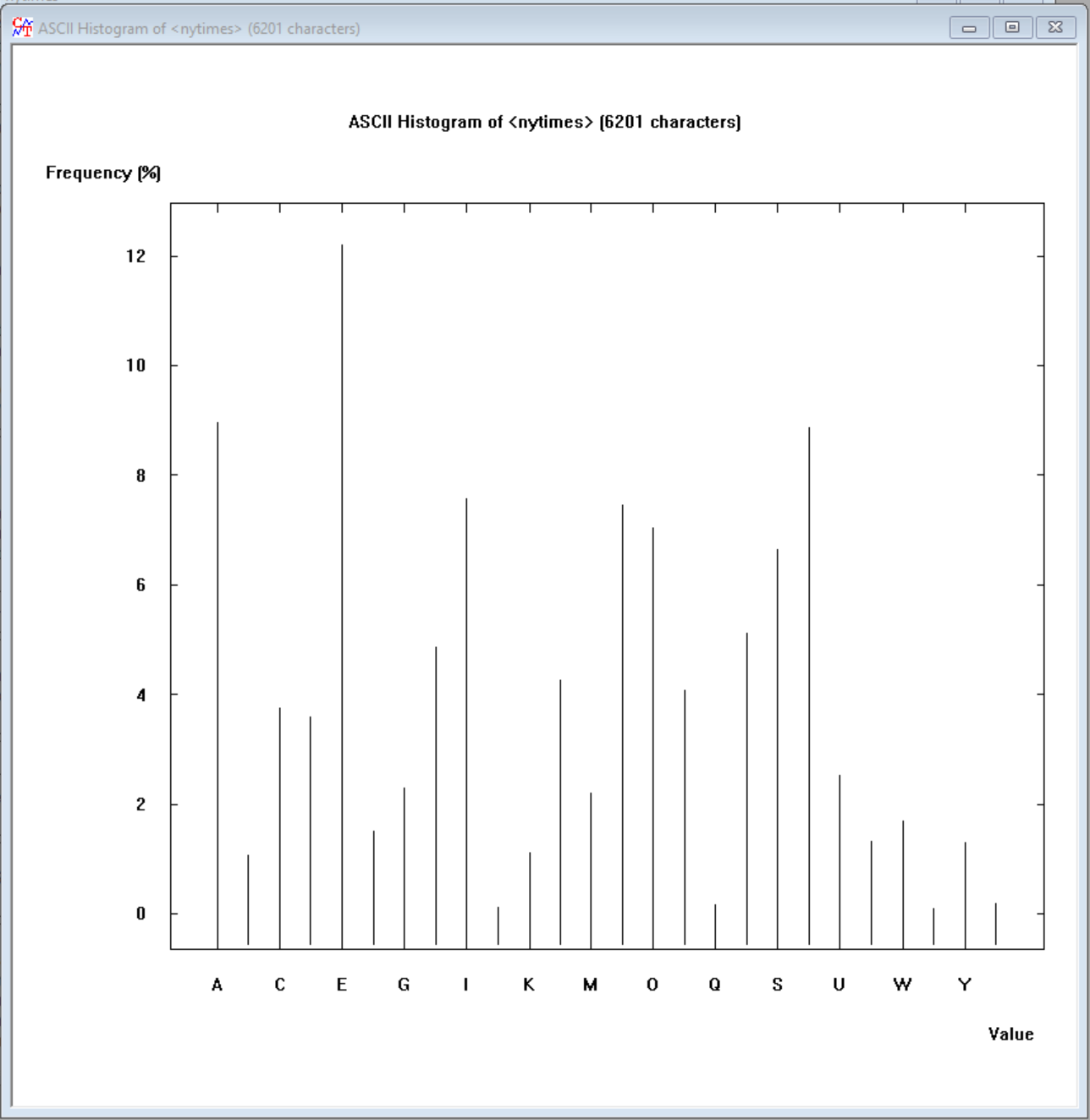
# Crypto Assignment

## Task 1 (4 points)

* (1.5 points) Create a histogram for each text that display the relative frequency of letters in a graphical form. For this, go to Analysis > Tools for Analysis. Provide the two histograms in screenshots.





* (1.5 points) Do the two histograms depend significantly on the texts you have provided?

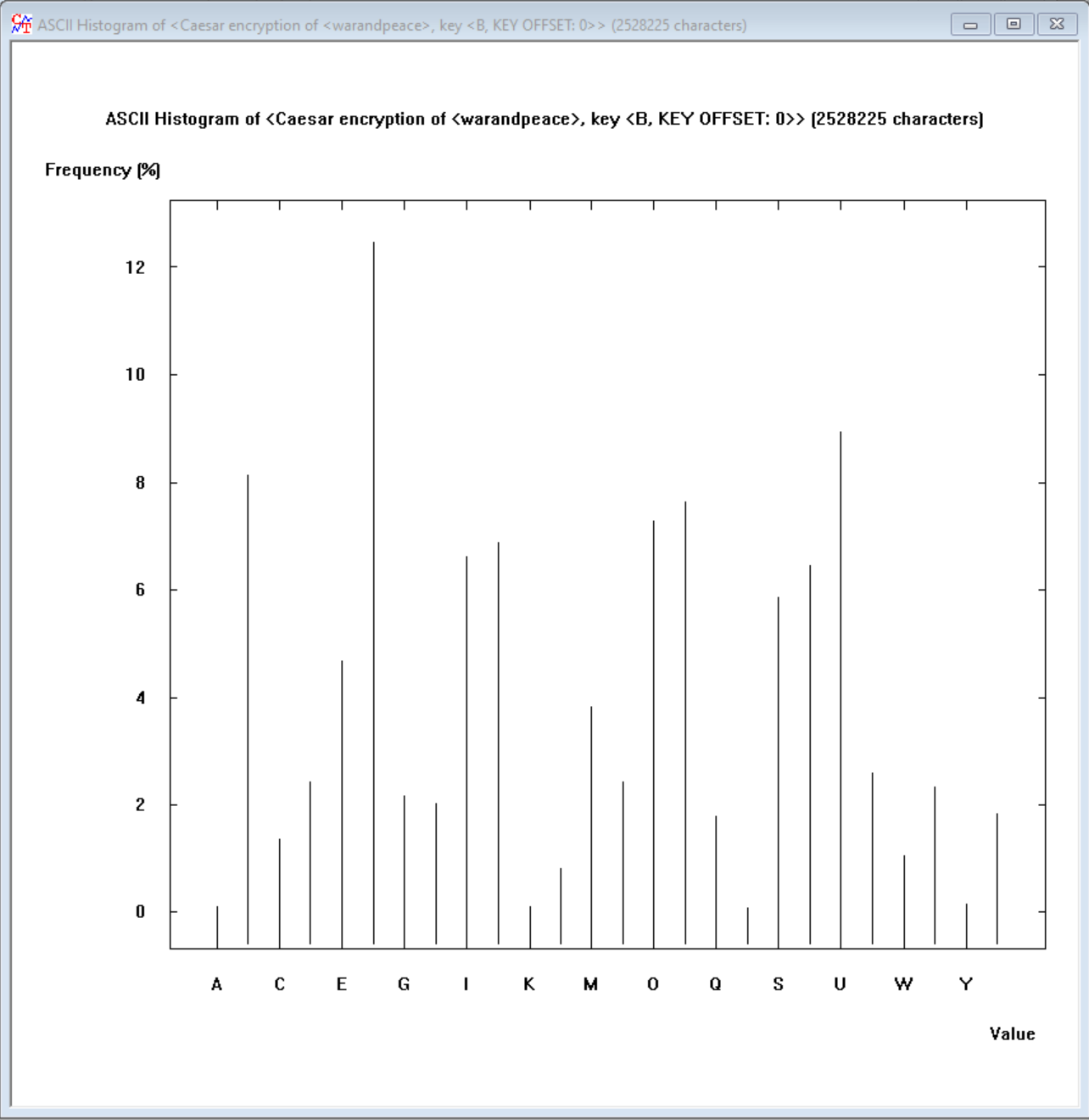
No, they depend on the language that the text file is in, since it depicts the frequency of each letter, with E being the highest followed by A and S in both files

* (1 point) Calculate the entropy of each text. For this, Analysis > Tools for Analysis > Entropy. What would you conclude from the comparison of the entropies?

The entropy is 4.16 and 4.17, which means they both contain much variation and they both use all 26 letters of the alphabet.

## Task 2 (4 points)

* (2 points) What are the characteristic features of the obtained distribution compared with the original text? Provide a screenshot to support your answer.



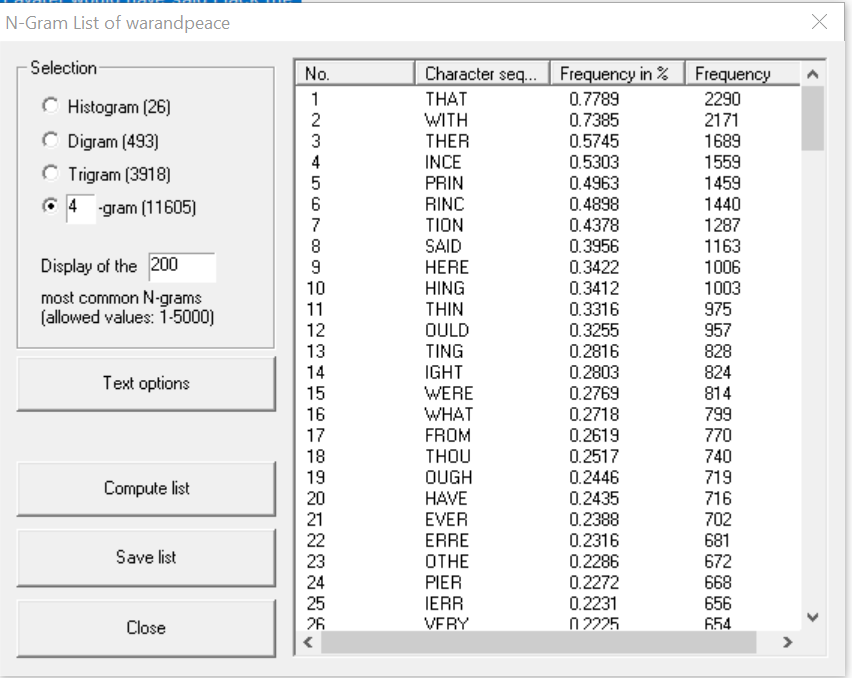
The histogram is exactly the same data with all points shifted over one letter, since that’s how a Caesar cypher works

* (2 points) How would you apply the features you have discovered in cracking the key?

I could infer that the most frequently used letter is E, followed by A and S somewhere in there. That would be the easiest way of cracking the code.

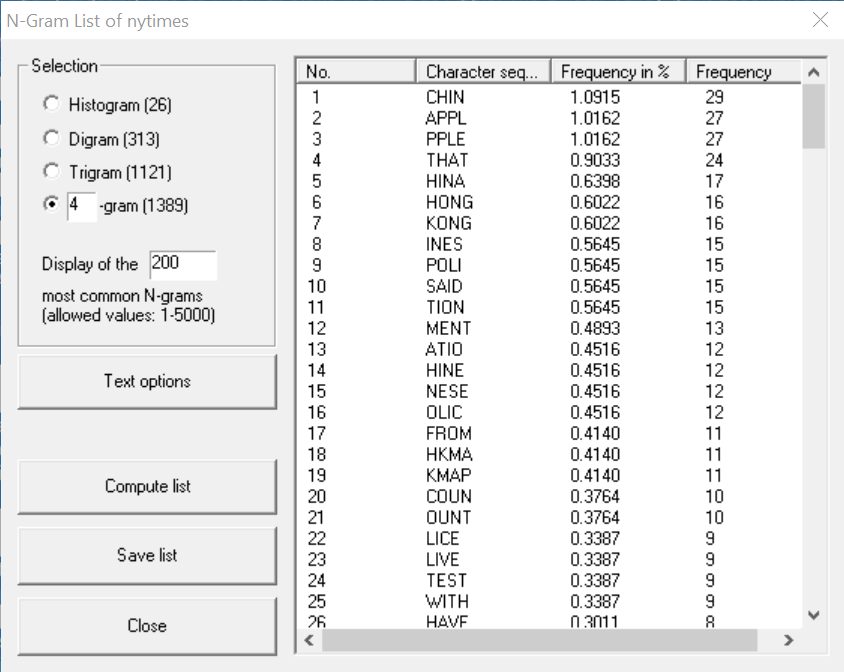
## Task 3 (4 points)

* (1.5 points for War&Peace\_Tolstoy.txt) Summarize your observation of the frequency distribution. Also, provide a screenshot of the frequency distribution.



This N-gram shows the most common 4 letter words or sequences found in the document, and they are in line with some of the most common in the English language

* (1.5 points for a NYT article) Summarize your observation of the frequency distribution. Also, provide a screenshot of the frequency distribution.



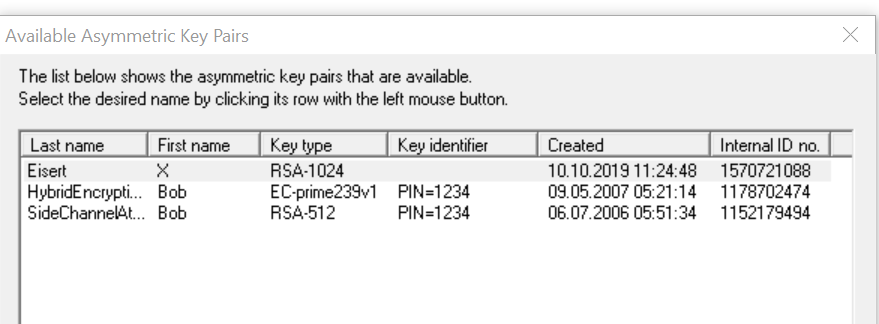
This specific N-gram is more in line with the subject of the article (Apple and Hong Kong)

* (1 point) Compare and contrast the two frequency distributions.

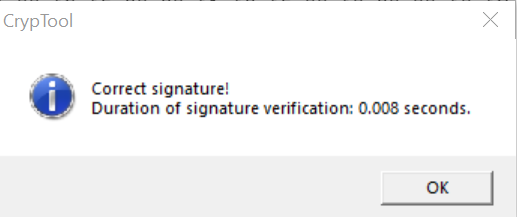
War and Peace had much more variety than the NY Times newsletter, probably because it’s a story rather than a news article.

## Task 4 (4 points)

* (2 points) Attach a screen shot that shows the successful creation of the key pair.



* (2 points) Attach a screenshot that displays the signature verification.



## Task 5 (4 points)

* (1 points) List the cipher and the key for Ciphertext 1.

Caesar cipher on Q

* ~~(1 points) List the cipher and the key for Ciphertext 2.~~
* (2 points) List the cipher and the key for Ciphertext 3.

ADFGVX cypher on password

HAMTOBEORNOTTOBETHATISTHEQUESTIONWHETHERTISNOBLERINTHEMINDTOSUFFERTHESLINGSANDARROWSOFOUTRAGEOUSFORTUNEORTOTAKEARMSAGAINSTASEAOFTROUBLESANDBYOPPOSINGENDTHEMTODIETOSLEEPNOMOREANDBYASLEEPTOSAYWEENDTHEHEARTACHEANDTHETHOUSANDNATURALSHOCKSTHATFLESHISHEIRTOTISACONSUMMATIONDEVOUTLYTOBEWISHDTODIETOSLEEPTOSLEEPPERCHANCETODREAMAYTHERESTHERUBFORINTHATSLEEPOFDEATHWHATDREAMSMAYCOMEWHENWEHAVESHUFFLEDOFFTHISMORTALCOILMUSTGIVEUSPAUSETHERESTHERESPECTTHATMAKESCALAMITYOFSOLONGLIFE