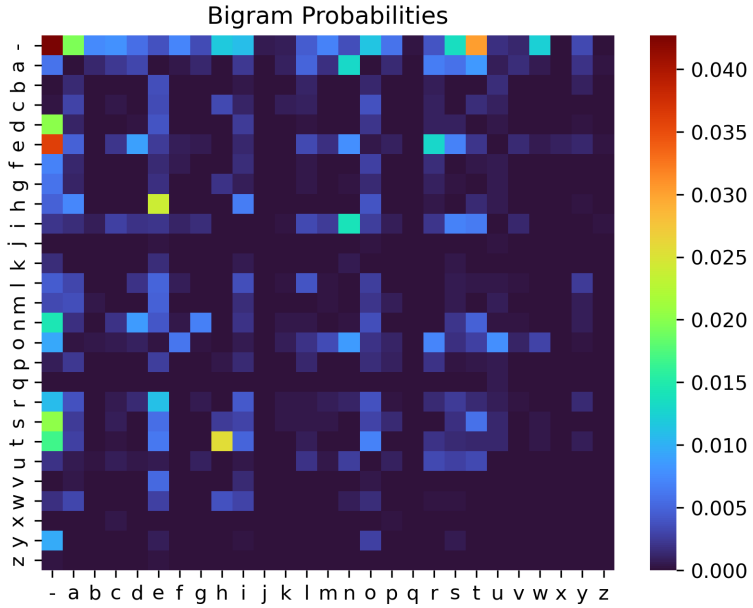
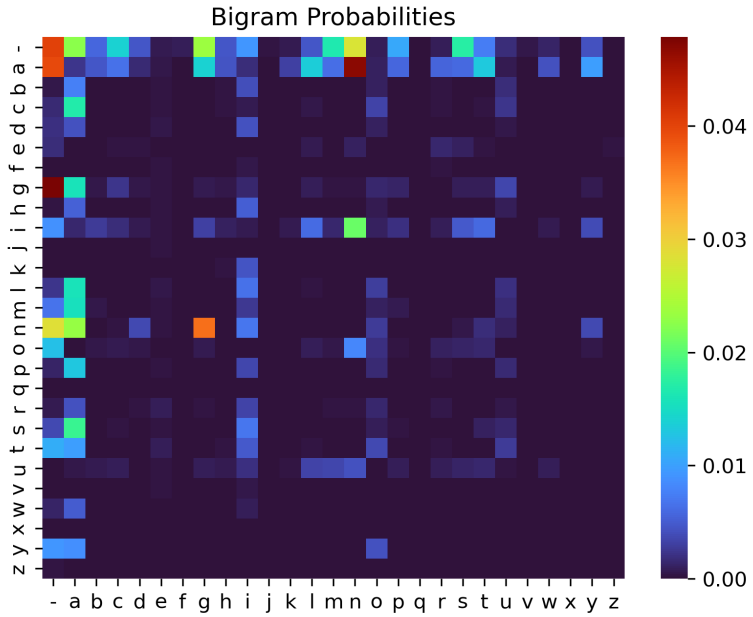
GCT561: Scientific Concept and Thinking
HW2: Probability and Statistics
Submitted by Vanessa Tan (20225640)

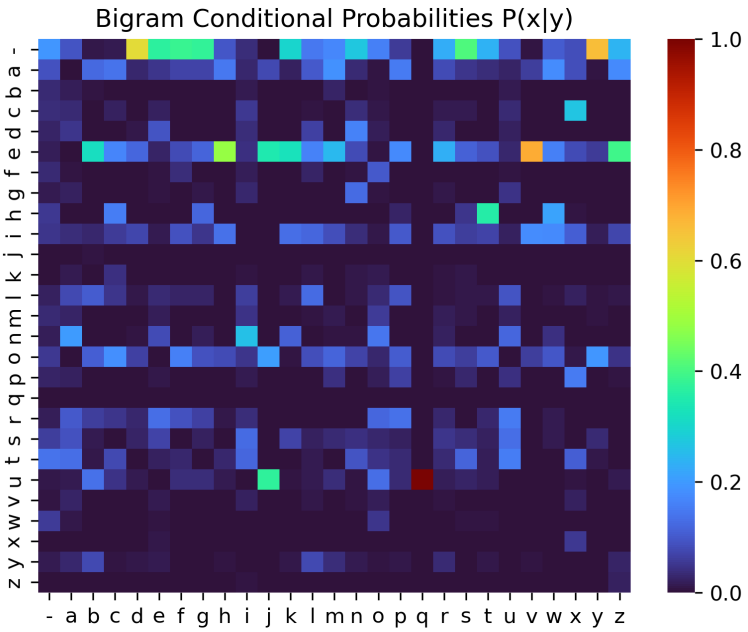
1. Bigram Probabilities
    a. Noli Me Tangere (English version)

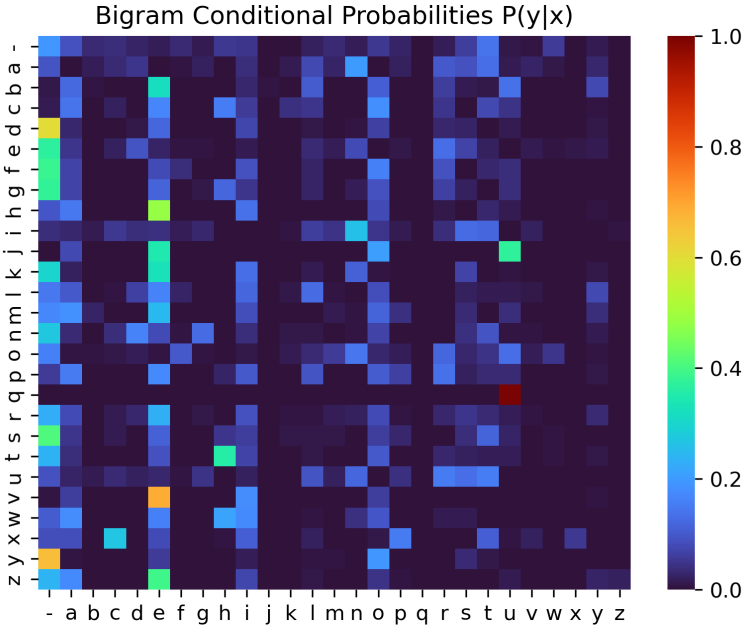


    b. Noli Me Tangere (Tagalog version)

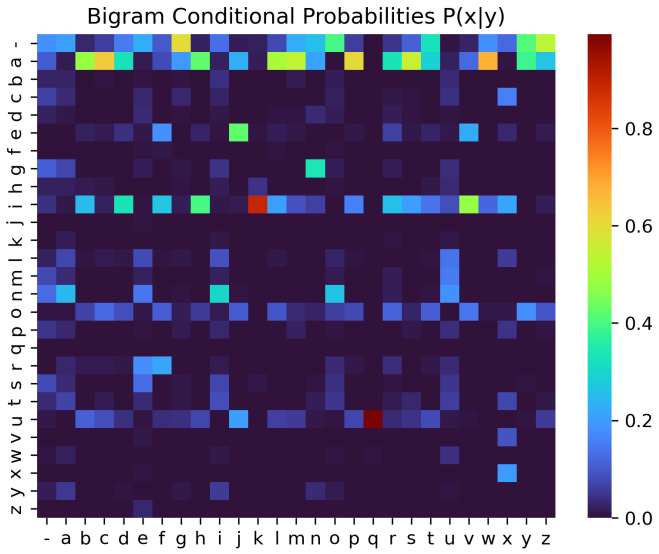


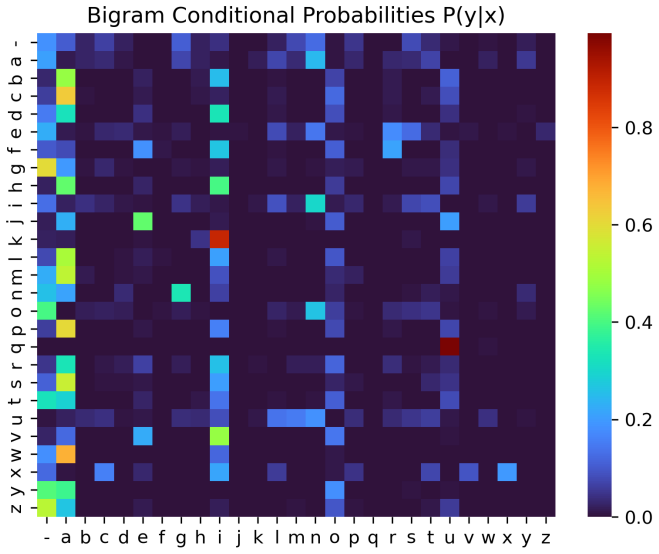
2. Conditional Probabilities
    a. Noli Me Tangere (English version)





b. Noli Me Tangere (Tagalog version)





3. Show that Bayesian theorem holds when x = “q” and y=”u”

   Bayes’ Theorem: $P(A|B) = \frac{P(B|A)P(A)}{P(B)}$ => $P(B)P(A|B) = P(B|A)P(A)$

   a. Noli Me Tangere (English version) result: 0.0 ≈ 0.001
   b. Noli Me Tangere (Tagalog version) result: 0.0 ≈ 0.0

4. Can you think of a way to reshuffle or combine different letters to beat the frequency analysis?

   Maybe we could use a different or random probability distribution of letters/bigrams every time someone tries to decrypt a message. We could also add shifts and substitutions to make the decryption harder.