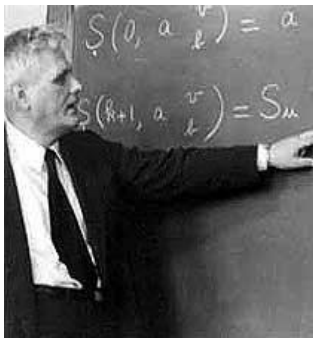
FYSE 1280: Fall 2025

Breaking The Code: The Enigma of Alan Turing

Assignment 5

For Wednesday, September 24



Alonzo Church

David Hilbert

Max Newman

Reading

Read Chapter 3 "The Universal Machine" of David Leavitt, *The Man Who Knew Too Much: Alan Turing and the Invention of the Computer.*

Read Chapter 4: "Birth of the Computer" in *Simply Turing*.

Exercises

1. Determine the keyword that resulted in the scrambled alphabet:

DAIRXOBJSZNCLTKFMUEGPVYHQW

Make sure you include a discussion on how you arrived at the keyword.

2. For a particular monoalphabetic substitution, a cryptographer used a keyword to generate a scrambling of the alphabet. After inspecting the frequency distribution for the cryptogram as well as some preliminary examination, the cryptanalyst discovered the plaintext-ciphertext equivalents for 10 characters, resulting in the following table

C	*	*	**S**	**E**	*	*	**V**	**N**	*	*	*	*	**F**	**M**	*	*	**G**	**O**	**Z**	*	*	*	*	*	*
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**

The ciphertext letters are in red; the plaintext equivalents are in blue. Show that with this information alone, and without access to the cryptogram itself, you can identify most of the remaining plaintext-ciphertext equivalents. Can you determine the keyword? Make sure you include an explanation of your work.