Week: 10 Date: 11/06/2025

15-110 Recitation Week 10

Reminders

- How was Exam 2?
- HW5 due Monday, November 10 at noon
- Recitation feedback form

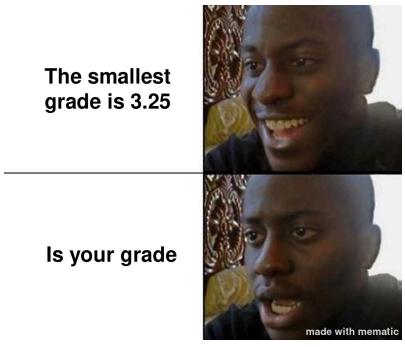
Overview

- Meme cipher encryption
- Asymmetric encryption
- Reading files
- Helper functions

Problems

Meme Cipher Encryption

Carnegie Mellon	
surprised	

I	
good	
cool	
grade	

Encrypt:

Carnegie Mellon is cool.

Decrypt:

What is the plaintext? _____

What is the ciphertext? _____

Is this a symmetric or asymmetric encryption algorithm? _____

How many keys are used? _____

What is the key? _____

What is the runtime to break this cipher? Keep in mind that an adversary knows each meme corresponds to a word, but they don't know which words are being used in the message. For this question, assume there are N words in the dictionary and 6 memes that are used. _____

Asymmetric / RSA Encryption

Emily wants to send a super secret message to Chloe about the 110 exam. She translates the message into a number: **11**, and then finds Chloe's public key online. Her key is **(5, 133)**.

How can Emily create the ciphertext? _____

Emily puts the ciphertext on her Instagram story, and tags Chloe. Why should this not worry Chloe or Emily?

Then Chloe receives it and decrypts it with her _____ **(65, 133)**.

Chloe gasps!

Reading Files

Match the following actions to the correct line of code.

filename = "file1.txt"

___Opening a file in read mode

___Reading a file

___Data type that results when reading a file

___Read *lines* of a file

___Opening a file in write mode

___Writing a string in a file

___Closing a file

a. f.readlines()

b. f.close()

c. string

d. f.write(text)

e. f = open(filename, 'w')

f. f = open(filename, 'r')

g. f.read()

Helper Functions

Michelle wants to build a game where you start with a list [2, 3, 4, 5, 6, 7, 8, 9, 10] and try to remove all the numbers in the list based on random dice rolls. At each turn, you roll two dice and sum them. Then, you can remove either **a pair of numbers** that add up to the sum, or the **sum itself.** You win by removing all the numbers, and lose if you get stuck and can no longer do any removals.

For example, if Michelle rolls 3 and 4 on the first roll, she can either remove 7, 5 and 2, or 3 and 4 from the list.

Try the game out for yourself here.

Describe the steps needed to make this game in plain English:

Now download the starter code. Michelle created a couple helper functions that implement these steps, but she forgot to write the playGame function! Let's help her out. (First look over the helper functions! What are they doing?)