HIT137
Group Assignment 2 (20% Mark)

Question 1

Create a program that reads the text file "raw_text.txt", encrypts its contents using a simple encryption method, and writes the encrypted text to a new file "encrypted_text.txt". Then create a function to decrypt the content, and a function to check the correctness of decrypted text.

Requirements

The encryption should take two user inputs (n, m), and follow these rules:

For lowercase letters:

If the letter is in first half of alphabet (a-m): shift forward by $n * m$

If the letter is in second half (n-z): shift backward by $n + m$

For uppercase letters:

If the letter is in first half (A-M): shift backward by n

If the letter is in second half (N-Z): shift forward by m^2

Special characters, and numbers remain unchanged.

Question 2

Create a program that analyses temperature data collected from multiple weather stations in Australia. The data is stored in multiple CSV files under a temperatures folder, with each file representing data from one year.

You need to:

Calculate the average temperatures for each season across all years. Save the result to file "average_temp.txt".

Find the station/stations have the largest temperature range. Save the result to file "largest_temp_range_station.txt".

Find the warmest and coolest station/stations. Save the result to file "warmest_and_coolest_station.txt".

Question 3

Create a program that use recursive function to generates a tree pattern using Python's turtle graphics. The program should take the following parameters from the user:

Left and right branch angles

Starting branch length

Recursion depth

Branch length reduction factor

Example:

The tree with branch left at 20 degrees and right at 25 degrees, starting with a branch length of 100 pixels, and make each new branch 70% long as its parent branch, letting it branch out 5 times.

Example output: