**Cyber Security Fundamentals**

**Assignment 1**

Python script used in VS Code to encrypt and decrypt using the Caesar cipher with the specified shift:

**def caesar\_encrypt(text, shift):**

**result = ""**

**for char in text:**

**if char.isalpha():**

**base = 'A' if char.isupper() else 'a'**

**shifted = chr((ord(char) - ord(base) + shift) % 26 + ord(base))**

**result += shifted**

**else:**

**result += char**

**return result**

**def caesar\_decrypt(text, shift):**

**return caesar\_encrypt(text, -shift)**

**def main():**

**shift = 4**

**# Prompt user for message to encrypt**

**message = input("Enter message to encrypt: ")**

**encrypted = caesar\_encrypt(message, shift)**

**print("Encrypted message:", encrypted)**

**# Prompt user for message to decrypt**

**ciphertext = input("Enter message to decrypt: ")**

**decrypted = caesar\_decrypt(ciphertext, shift)**

**print("Decrypted message:", decrypted)**

**if \_\_name\_\_ == "\_\_main\_\_":**

**main()**

1. Define the Encryption Function

The **caesar\_encrypt** function shifts each alphabetic character in the input text forward by the specified shift.

* It loops through each character.
* Checks if the character is a letter (ignores punctuation and spaces).
* Preserves case (uppercase/lowercase) using ASCII values.
* Converts characters with wrapping around Z to A.
* Non-alpha characters are added unchanged.

Example: ‘A’ shifted by 4 becomes ‘E’.

2. Define the Decryption Function

The **caesar\_decrypt** function simply calls **caesar\_encrypt** with the negative of the shift:

* To decrypt, we move letters backward by the same shift.
* This reuse of the encrypt function keeps the code concise and clear.

3. Main Program Logic

The **main()** function runs when you execute the script.

* Sets the shift to 4.
* Prompts the user to enter a message to encrypt.
* Prints the encrypted message.
* Prompts the user to enter a ciphertext to decrypt.
* Prints the decrypted message.

This interaction happens in the terminal with simple input/output.

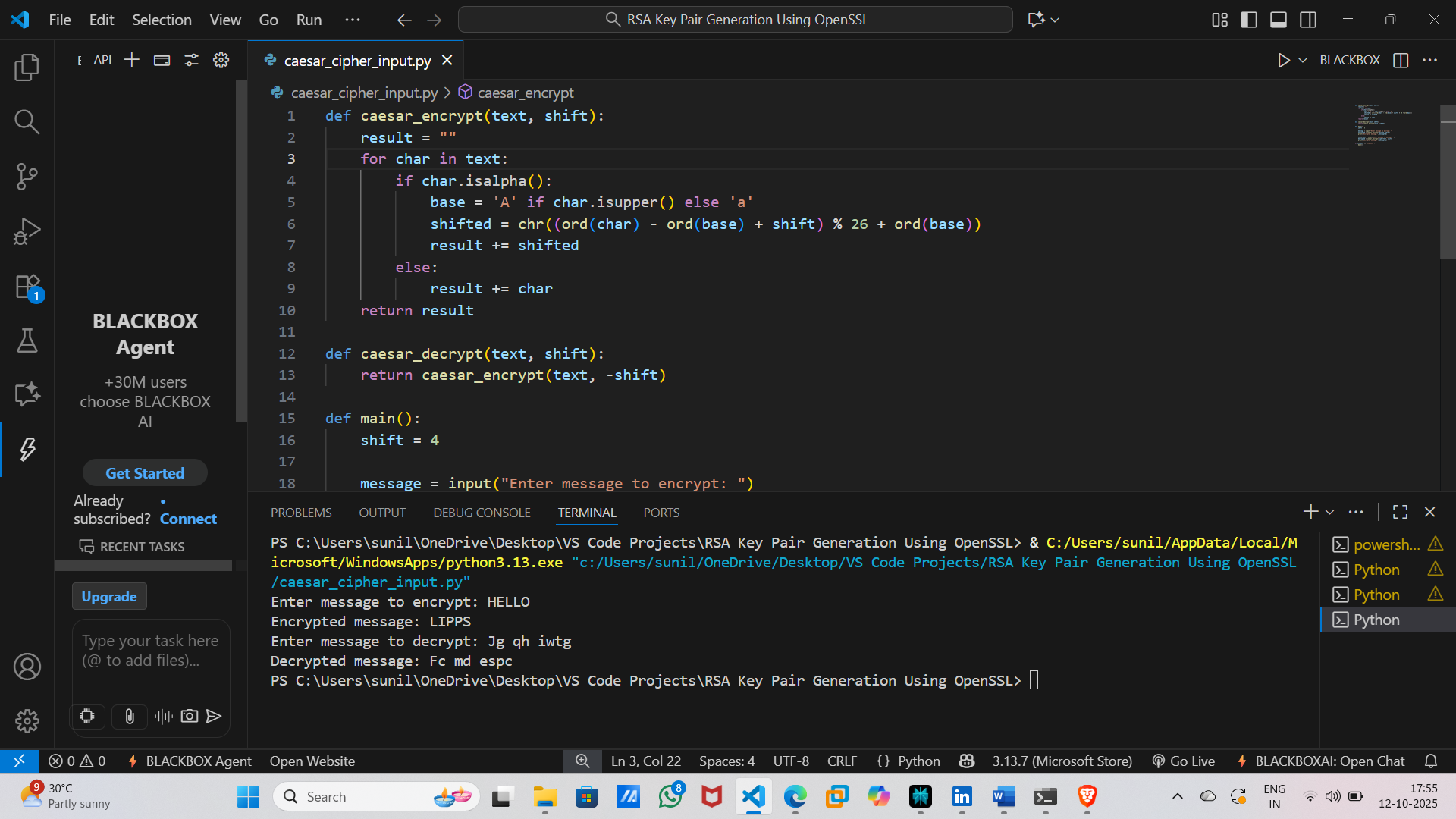
4. Running the Script

* Open VS Code terminal.
* Execute with python **caesar\_cipher\_input.py**.
* Follow prompts to enter your messages.

This makes the program easy to test with different inputs without changing the code.

Key Takeaways

* The Caesar cipher shifts letters with wrapping.
* Case and non-letter characters are handled gracefully.
* The script is interactive, user-friendly.
* Code reuse by calling encryption with negative shift for decryption.

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