CRYPTOGRAPHY AND NETWORK SECURITY

LAB 5: IMPLEMENTATION OF DES ENCRYPTION USING SUITABLE PROGRAMMING LANGUAGE

NAME : OM SUBRATO DEY

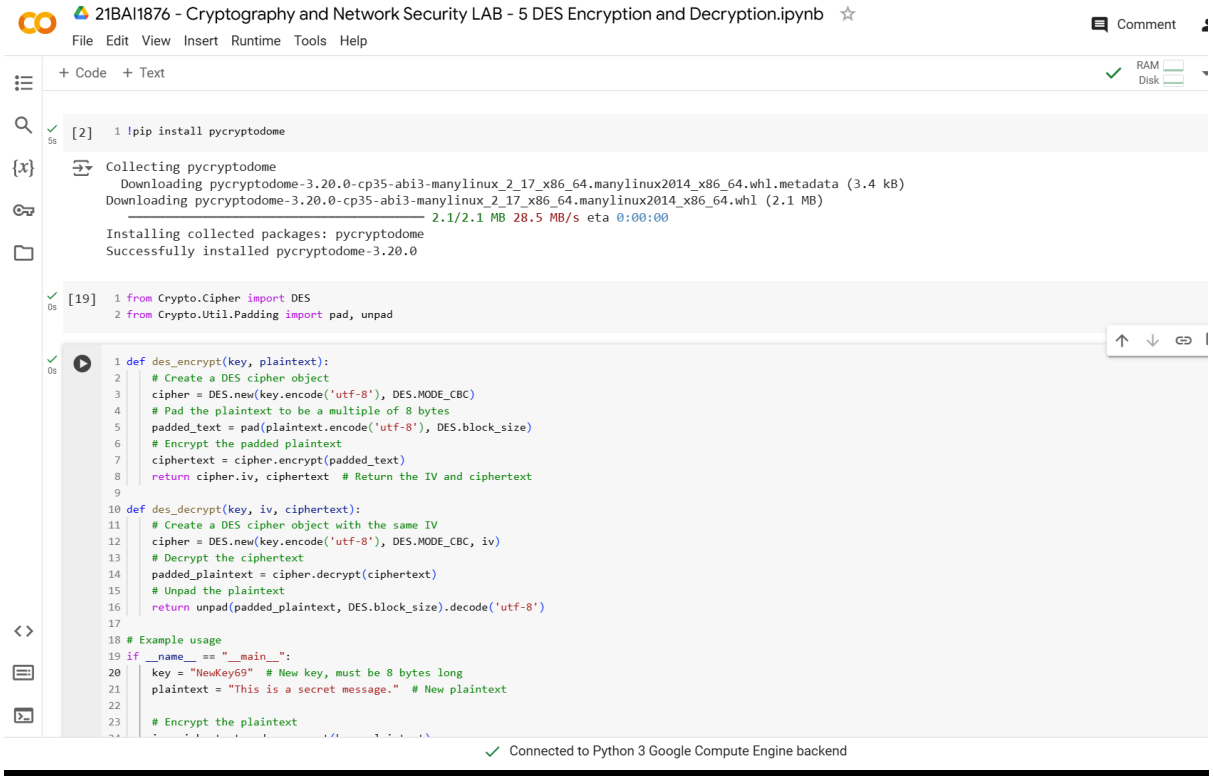
REGISTER NO.: 21BAI1876

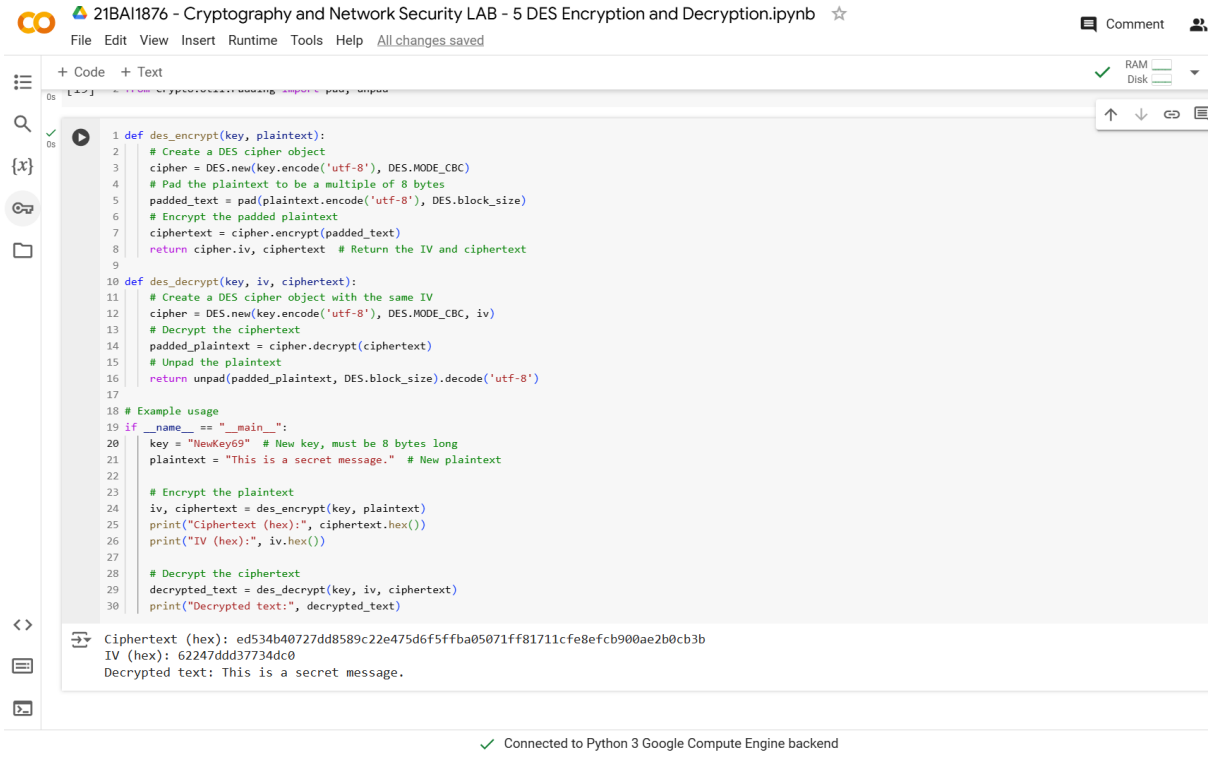
CODE:

```
from Crypto.Cipher import DES
from Crypto.Util.Padding import pad, unpad
def des_encrypt(key, plaintext):
    # Create a DES cipher object
    cipher = DES.new(key.encode('utf-8'), DES.MODE_CBC)
    # Pad the plaintext to be a multiple of 8 bytes
    padded_text = pad(plaintext.encode('utf-8'),
DES.block_size)
    # Encrypt the padded plaintext
    ciphertext = cipher.encrypt(padded_text)
    return cipher.iv, ciphertext  # Return the IV and
ciphertext


def des_decrypt(key, iv, ciphertext):
    # Create a DES cipher object with the same IV
    cipher = DES.new(key.encode('utf-8'), DES.MODE_CBC,
iv)
    # Decrypt the ciphertext
    padded_plaintext = cipher.decrypt(ciphertext)
    # Unpad the plaintext
    return unpad(padded_plaintext,
DES.block_size).decode('utf-8')


# Example usage
if __name__ == "__main__":
    key = "NewKey69"  # New key, must be 8 bytes long
```

```
    plaintext = "This is a secret message."  # New
plaintext


    # Encrypt the plaintext
    iv, ciphertext = des_encrypt(key, plaintext)
    print("Ciphertext (hex):", ciphertext.hex())
    print("IV (hex):", iv.hex())

    # Decrypt the ciphertext
    decrypted_text = des_decrypt(key, iv, ciphertext)
    print("Decrypted text:", decrypted_text)
```

OUTPUT:


21BAI1876 - Cryptography and Network Security LAB - 5 DES Encryption and Decryption.ipynb
File Edit View Insert Runtime Tools Help
Comment
+ Code + Text
RAM
Disk
[2] 1 !pip install pycryptodome
Collecting pycryptodome
Downloading pycryptodome-3.20.0-cp35-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (3.4 kB)
Downloading pycryptodome-3.20.0-cp35-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (2.1 MB)
2.1/2.1 MB 28.5 MB/s eta 0:00:00
Installing collected packages: pycryptodome
Successfully installed pycryptodome-3.20.0
[19] 1 from Crypto.Cipher import DES
2 from Crypto.Util.Padding import pad, unpad
1 def des_encrypt(key, plaintext):
2 # Create a DES cipher object
3 cipher = DES.new(key.encode('utf-8'), DES.MODE_CBC)
4 # Pad the plaintext to be a multiple of 8 bytes
5 padded_text = pad(plaintext.encode('utf-8'), DES.block_size)
6 # Encrypt the padded plaintext
7 ciphertext = cipher.encrypt(padded_text)
8 return cipher.iv, ciphertext # Return the IV and ciphertext
9
10 def des_decrypt(key, iv, ciphertext):
11 # Create a DES cipher object with the same IV
12 cipher = DES.new(key.encode('utf-8'), DES.MODE_CBC, iv)
13 # Decrypt the ciphertext
14 padded_plaintext = cipher.decrypt(ciphertext)
15 # Unpad the plaintext
16 return unpad(padded_plaintext, DES.block_size).decode('utf-8')
17
18 # Example usage
19 if __name__ == "__main__":
20 key = "NewKey69" # New key, must be 8 bytes long
21 plaintext = "This is a secret message." # New plaintext
22
23 # Encrypt the plaintext
Connected to Python 3 Google Compute Engine backend


21BAI1876 - Cryptography and Network Security LAB - 5 DES Encryption and Decryption.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
+ Code + Text
RAM
Disk
1 def des_encrypt(key, plaintext):
2 # Create a DES cipher object
3 cipher = DES.new(key.encode('utf-8'), DES.MODE_CBC)
4 # Pad the plaintext to be a multiple of 8 bytes
5 padded_text = pad(plaintext.encode('utf-8'), DES.block_size)
6 # Encrypt the padded plaintext
7 ciphertext = cipher.encrypt(padded_text)
8 return cipher.iv, ciphertext # Return the IV and ciphertext
9
10 def des_decrypt(key, iv, ciphertext):
11 # Create a DES cipher object with the same IV
12 cipher = DES.new(key.encode('utf-8'), DES.MODE_CBC, iv)
13 # Decrypt the ciphertext
14 padded_plaintext = cipher.decrypt(ciphertext)
15 # Unpad the plaintext
16 return unpad(padded_plaintext, DES.block_size).decode('utf-8')
17
18 # Example usage
19 if __name__ == "__main__":
20 key = "NewKey69" # New key, must be 8 bytes long
21 plaintext = "This is a secret message." # New plaintext
22
23 # Encrypt the plaintext
24 iv, ciphertext = des_encrypt(key, plaintext)
25 print("Ciphertext (hex):", ciphertext.hex())
26 print("IV (hex):", iv.hex())
27
28 # Decrypt the ciphertext
29 decrypted_text = des_decrypt(key, iv, ciphertext)
30 print("Decrypted text:", decrypted_text)
Ciphertext (hex): ed534b40727dd8589c22e475d6f5ffba05071ff81711cfe8efcb900ae2b0cb3b
IV (hex): 62247ddd37734dc0
Decrypted text: This is a secret message.
Connected to Python 3 Google Compute Engine backend