Step 1: Start

Step 2: Initialize Scanner for Input

2.1:Create a Scanner object,

scanner = new Scanner(System.in)

Step 3:Input Key

3.1:Prompt "Enter a key" and store the input in key.

print("Enter a key: ")

key = scanner.nextLine()

Step 4: Generate DES Key

4.1:Convert key to bytes as keyBytes.

4.2:Hash keyBytes with MD5 to produce keyHash.

4.3:Generate desKey using DESKeySpec and SecretKeyFactory,

keyBytes = key.getBytes()

keyHash = MD5.digest(keyBytes)

desKey = SecretKeyFactory.getInstance("DES").generateSecret(new DESKeySpec(keyHash))

Step 5: Input Message

5.1:Prompt "Enter a message" and store it in message.

5.2:Convert message to bytes as messageBytes.

print("Enter a message: ")

message = scanner.nextLine()

messageBytes = message.getBytes()

Step 6: Encrypt the Message

6.1:Initialize Cipher instance for DES encryption.

6.2:Set cipher to encryption mode with desKey.

6.3:Encrypt messageBytes to produce ciphertextBytes.

desCipher = Cipher.getInstance("DES")

desCipher.init(ENCRYPT_MODE, desKey)

ciphertextBytes = desCipher.doFinal(messageBytes)

Step 7: Display Ciphertext

7.1:Print each byte in ciphertextBytes as hexadecimal.

print("Ciphertext is: ")

for each byte in ciphertextBytes:

print byte as hexadecimal

Step 8: Decrypt the Ciphertext

8.1:Reinitialize Cipher for decryption with desKey.

8.2:Decrypt ciphertextBytes to obtain plaintextBytes.

8.3:Convert plaintextBytes to plaintext.

desCipher.init(DECRYPT_MODE, desKey)

plaintextBytes = desCipher.doFinal(ciphertextBytes)

plaintext = new String(plaintextBytes)

Step 9: Display Plaintext

9.1:Print plaintext.

print("Plaintext is: " + plaintext)

Step !0: Stop