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