6) To write a C program to implement Data Encryption Standard (DES) using C Language.

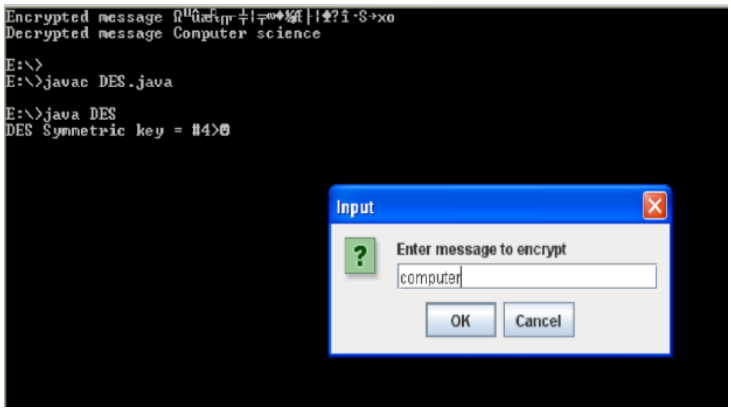
PROGRAM:-

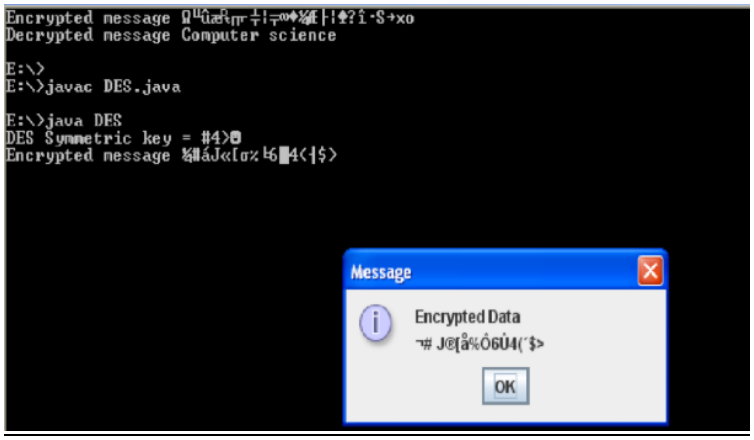
```
import javax.swing.*;
import java.security.SecureRandom;
import javax.crypto.Cipher;
import javax.crypto.KeyGenerator;
import javax.crypto.SecretKey;
import javax.crypto.spec.SecretKeySpec;
import java.util.Random ;
class DES {
byte[] skey = new byte[1000];
String skeyString;
static byte[] raw;
String inputMessage,encryptedData,decryptedMessage;
public DES()
{
try
{
generateSymmetricKey();
inputMessage=JOptionPane.showInputDialog(null,"Enter
message to encrypt");
byte[] ibyte = inputMessage.getBytes();
byte[] ebyte=encrypt(raw, ibyte);
String encryptedData = new String(ebyte);
System.out.println("Encrypted message "+encryptedData);
JOptionPane.showMessageDialog(null,"Encrypted Data
"+"\n"+encryptedData);
byte[] dbyte= decrypt(raw,ebyte);
String decryptedMessage = new String(dbyte);
System.out.println("Decrypted message
"+decryptedMessage);
```

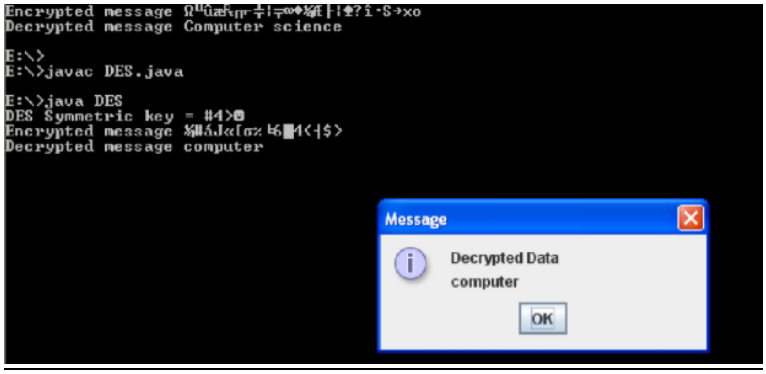
```
JOptionPane.showMessageDialog(null,"Decrypted Data
"+"\n"+decryptedMessage);
}
catch(Exception e)
{
System.out.println(e);
}
}
void generateSymmetricKey() {
try {
Random r = new Random();
int num = r.nextInt(10000);
String knum = String.valueOf(num);
byte[] knumb = knum.getBytes();
skey=getRawKey(knumb);
skeyString = new String(skey);
System.out.println("DES Symmetric key = "+skeyString);
}
catch(Exception e)
{
System.out.println(e);
}
}
private static byte[] getRawKey(byte[] seed) throws Exception
{
KeyGenerator kgen = KeyGenerator.getInstance("DES");
SecureRandom sr = SecureRandom.getInstance("SHA1PRNG");
sr.setSeed(seed);
kgen.init(56, sr);
SecretKey skey = kgen.generateKey();
raw = skey.getEncoded();
```

```
return raw;
}
private static byte[] encrypt(byte[] raw, byte[] clear) throws
Exception {
SecretKeySpec skeySpec = new SecretKeySpec(raw,
"DES");
Cipher cipher = Cipher.getInstance("DES");
cipher.init(Cipher.ENCRYPT_MODE, skeySpec);
byte[] encrypted = cipher.doFinal(clear);
return encrypted;
}
private static byte[] decrypt(byte[] raw, byte[] encrypted)
throws Exception
{
SecretKeySpec skeySpec = new SecretKeySpec(raw,
"DES");
Cipher cipher = Cipher.getInstance("DES");
cipher.init(Cipher.DECRYPT_MODE, skeySpec);
byte[] decrypted = cipher.doFinal(encrypted);
return decrypted;
}
public static void main(String args[]) {
DES des = new DES();
}
}
```

OUTPUT:-


Encrypted message
Decrypted message Computer science
E:\>
E:\>javac DES.java
E:\>java DES
DES Symmetric key =
Input
Enter message to encrypt
computer
OK
Cancel


Encrypted message
Decrypted message Computer science
E:\>
E:\>javac DES.java
E:\>java DES
DES Symmetric key =
Encrypted message
Message
Encrypted Data
OK


Encrypted message
Decrypted message Computer science
E:\>
E:\>javac DES.java
E:\>java DES
DES Symmetric key =
Encrypted message
Decrypted message computer
Message
Decrypted Data
computer
OK