IT8761 – Security Laboratory

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Exercise 5

Aim: To implement the Advanced Encryption Standard (AES) algorithm.

Code:

```
import java.io.UnsupportedEncodingException;
import java.security.MessageDigest;
import java.security.NoSuchAlgorithmException;
import java.util.Arrays;
import java.util.Base64;
import javax.crypto.Cipher;
import javax.crypto.spec.SecretKeySpec;
public class AES {
  private static SecretKeySpec secretKey;
  private static byte[] key;
  public static void setKey(String myKey) {
    MessageDigest sha = null;
    try {
      key = myKey.getBytes("UTF-8");
      sha = MessageDigest.getInstance("SHA-1");
      key = sha.digest(key);
      key = Arrays.copyOf(key, 16);
      secretKey = new SecretKeySpec(key, "AES");
    }
    catch (NoSuchAlgorithmException e) {
      e.printStackTrace();
```

```
        }
        catch (UnsupportedEncodingException e) {
            e.printStackTrace();
        }
    }
    public static String encrypt(String strToEncrypt, String secret)
    {
        try
        {
            setKey(secret);
            Cipher cipher = Cipher.getInstance("AES/ECB/PKCS5Padding");
            cipher.init(Cipher.ENCRYPT_MODE, secretKey);
            return Base64.getEncoder().encodeToString(cipher.doFinal(strToEncrypt.getBytes("UTF-8")));
        }
        catch (Exception e)
        {
            System.out.println("Error while encrypting: " + e.toString());
        }
        return null;
    }
    public static String decrypt(String strToDecrypt, String secret)
    {
        try
        {
            setKey(secret);
```

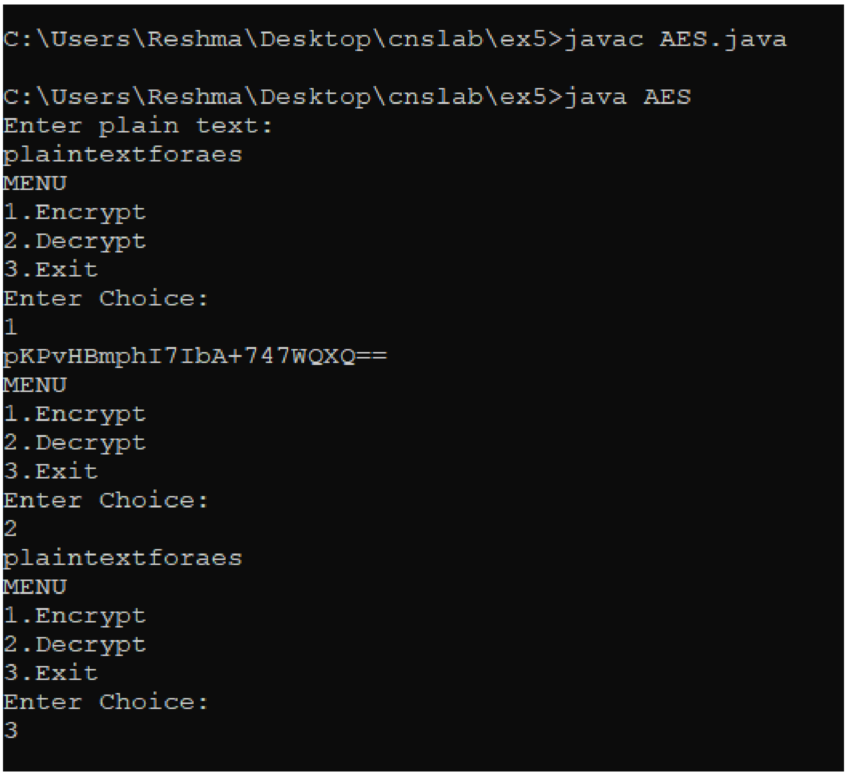
```
      Cipher cipher = Cipher.getInstance("AES/ECB/PKCS5PADDING");
      cipher.init(Cipher.DECRYPT_MODE, secretKey);
      return new
String(cipher.doFinal(Base64.getDecoder().decode(strToDecrypt)));
    }
    catch (Exception e)
    {
      System.out.println("Error while decrypting: " + e.toString());
    }
    return null;
  }
public static void main(String[] args)
{
  final String secretKey = "aessecretkey!!!!";

  String originalString;
  System.out.println("Enter plain text:");
  originalString = System.console().readLine();
  int ch;
  String encryptedString = AES.encrypt(originalString, secretKey) ;
      do{
      System.out.println("MENU\n1.Encrypt\n2.Decrypt\n3.Exit");
      System.out.println("Enter Choice:");
      String c = System.console().readLine();
      ch=Integer.parseInt(c);
      if(ch==1)
      {
```

```
                System.out.println(encryptedString);
            }
            else if(ch==2)
            {
               String decryptedString = AES.decrypt(encryptedString, secretKey) ;
            System.out.println(decryptedString);
            }
            }while(ch!=3);


    }
}
```

Output:



```
C:\Users\Reshma\Desktop\cnslab\ex5>javac AES.java

C:\Users\Reshma\Desktop\cnslab\ex5>java AES
Enter plain text:
plaintextforaes
MENU
1.Encrypt
2.Decrypt
3.Exit
Enter Choice:
1
pKPvHBmphI7IbA+747WQXQ==
MENU
1.Encrypt
2.Decrypt
3.Exit
Enter Choice:
2
plaintextforaes
MENU
1.Encrypt
2.Decrypt
3.Exit
Enter Choice:
3
```