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## Practical no 4

**AIM:** Write program to encrypt and decrypt strings using

1) DES Algorithm 2) AES Algorithm

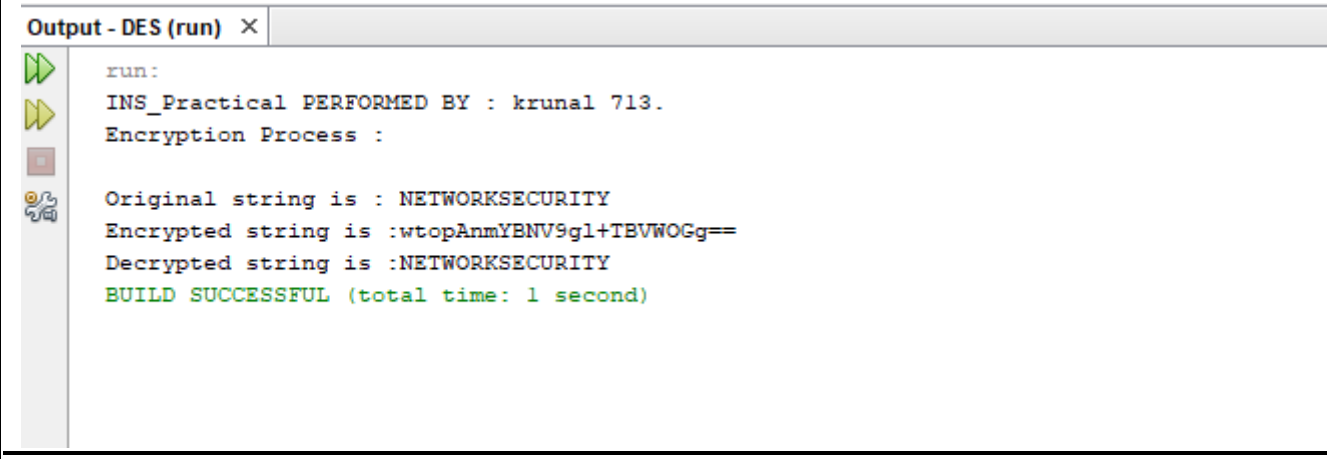
## CODE

```
import java.util.logging.Level;
import java.util.logging.Logger;
import java.util.Base64;
import javax.crypto.Cipher;
import javax.crypto.KeyGenerator;
import javax.crypto.SecretKey;
public class DES {
    public static SecretKey getSecretEncryptionKey() throws Exception{
        KeyGenerator generator=KeyGenerator.getInstance("DES");
        SecretKey secKey=generator.generateKey();
        return secKey;
    }
    public String encrypt(SecretKey key,String Plaintext) throws Exception{
        byte[] utf8=Plaintext.getBytes();
        Cipher ecipher=Cipher.getInstance("DES");
        ecipher.init(Cipher.ENCRYPT_MODE, key);
        byte[] enc=ecipher.doFinal(utf8);
        Base64.Encoder encoder=Base64.getEncoder();
        String et=encoder.encodeToString(enc);
        return et;
```

```
}
public String decrypt(SecretKey key,String Ciphertext) throws Exception{
    Base64.Decoder decoder = Base64.getDecoder();
    byte[] dec=decoder.decode(Ciphertext);
    Cipher dcipher=Cipher.getInstance("DES");
    dcipher.init(Cipher.DECRYPT_MODE, key);
    byte[] utf8=dcipher.doFinal(dec);
    return new String(utf8,"UTF8");

}
public static void main(String[] args){
    try{
        System.out.println("INS_Practical PERFORMED BY : krunal 713.");
        System.out.println("----'--Encrypting string using DES--'----");
        System.out.println();
        String message ="NETWORKSECURITY";
        DES d=new DES();
        SecretKey key=getSecretEncryptionKey();
        String Encrypted=d.encrypt(key, message);
        String Decrypted=d.decrypt(key, Encrypted);
        System.out.println("Original String is : "+ message);
        System.out.println("Encrypted String is : "+ Encrypted);
        System.out.println("Decrypted String is : "+ Decrypted);
    }catch (Exception ex){
        Logger.getLogger(DES.class.getName()).log(Level.SEVERE,null,ex);
    }
```

```
    }
}
```




**b) AES CODE**

```
package aes;
import java.util.logging.Logger;
import  java.util.logging.Level;
import javax.crypto.Cipher;
import javax.crypto.KeyGenerator;
import javax.crypto.SecretKey;

public class AES {
    public static SecretKey getSecretEncryptionKey() throws Exception{
        KeyGenerator generator = KeyGenerator.getInstance("AES");
        generator.init(128);
        SecretKey secKey= generator.generateKey();
        return secKey;
    }

    public String encrypt(SecretKey key,String Plaintext)throws Exception{
        byte[] utf8= Plaintext.getBytes("UTF8");
        Cipher ecipher= Cipher.getInstance("AES");
        ecipher.init(Cipher.ENCRYPT_MODE,key);
        byte[] enc= ecipher.doFinal(utf8);
        return new sun.misc.BASE64Encoder().encode(enc);
    }
```

```
    public String decrypt(SecretKey key,String Ciphertext) throws Exception{
        byte[] dec= new sun.misc.BASE64Decoder().decodeBuffer(Ciphertext);
        Cipher dcipher= Cipher.getInstance("AES");
        dcipher.init(Cipher.DECRYPT_MODE,key);
        byte[] utf8= dcipher.doFinal(dec);
        return new String(utf8, "UTF8");
    }

    public static void main (String[]args) throws Exception
    {
        try{
            System.out.println("Performed by : krunal ,713");
            System.out.println("Encryption using AES");
            String message="NETWORK SECURITY";
            AES d= new AES();
            SecretKey key= getSecretEncryptionKey();
            String Encrypted= d.encrypt(key, message);
            String decrypted = d.decrypt(key,Encrypted);
            System.out.println("Original string is:" +message);
            System.out.println("Encrypted string is:" + Encrypted);
            System.out.println("Decrypted string is:" +decrypted);
        }
         catch(Exception ex){
            Logger.getLogger(AES.class.getName()).log(Level.SEVERE,null,ex) ;
        }
    }
}
```