Encryption and Decryption

Miniproject Report

Submitted by

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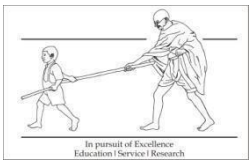
To the Faculty of Engineering of
Mahatma Gandhi Mission University, Aurangabad

Under Guidance of

Prof. Chaitali Patil.



Department of Computer Science & Engineering

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ABSTRACT

Objectives:

- To protect data content, rather than preventing unauthorized interception of or access to data transmissions.
- For security organizations and in personal security software designed to protect user data.

Website is created for:

For securing sensitive data and to decrypt the encrypted the data

Functionality:

- Encryption prevent unauthorized parties from reading it
- Decryption converts an encrypted message back to its original format.
- Secures sensitive information.
- Cannot be Corrupted
- Enhanced Security

Topics Included:

1. Java programming.
2. Use of IDE.
3. Use of DES (Data encryption standard).

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Introduction

This project is for security purposes, in this project you can encrypt your text file and again decrypt it. In this project, we have used the DES algorithm and cipher concept for encryption. The Encryption techniques hide the original content of a data in such a way that the original information is recovered only through using a key known as decryption process. The objective of the encryption is to secure or protect data from unauthorized access in term of viewing or modifying the data.

Specifications

Interpreter:

- Text Editor
- IDE

The Encryption techniques hide the original content of a data in such a way that the original information is recovered only through using a key known as decryption process. The objective of the encryption is to secure or protect data from unauthorized access in term of viewing or modifying the data.

Implementation of program:

ED - Notepad

File Edit View

```
import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.security.InvalidKeyException;
/*import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.security.InvalidAlgorithmParameterException;
import java.security.InvalidKeyException;*/
import java.security.NoSuchAlgorithmException;
import java.security.SecureRandom;
import java.security.spec.InvalidKeySpecException;
import java.util.Scanner;

import javax.crypto.Cipher;
import javax.crypto.CipherInputStream;
import javax.crypto.CipherOutputStream;
import javax.crypto.NoSuchPaddingException;
import javax.crypto.SecretKey;
import javax.crypto.SecretKeyFactory;
import javax.crypto.spec.DESKeySpec;

public class ED
{
    public static void encryptDecrypt(String key, int cipherMode, File in, File out)
    throws InvalidKeyException, NoSuchAlgorithmException, InvalidKeySpecException, NoSuchPaddingException,
    IOException
```

ED - Notepad

File Edit View

```
    {
        FileInputStream fis=new FileInputStream(in);
        FileOutputStream fos=new FileOutputStream(out);

        DESKeySpec desKeySpec=new DESKeySpec(key.getBytes());

        SecretKeyFactory skf= SecretKeyFactory.getInstance("DES");
        SecretKey secretKey=skf.generateSecret(desKeySpec);

        Cipher cipher=Cipher.getInstance("DES/ECB/PKCS5Padding");

        if(cipherMode==Cipher.ENCRYPT_MODE)
        {
            cipher.init(Cipher.ENCRYPT_MODE, secretKey, SecureRandom.getInstance("SHA1PRNG"));
            CipherInputStream cis=new CipherInputStream(fis,cipher);
            write(cis,fos);
        }
        else if(cipherMode==Cipher.DECRYPT_MODE)
        {
           cipher.init(Cipher.DECRYPT_MODE, secretKey, SecureRandom.getInstance("SHA1PRNG"));
           CipherOutputStream cos=new CipherOutputStream(fos, cipher);
           write(fis, cos);
        }

    }
    private static void write(InputStream in, OutputStream out)throws IOException
    {
        byte[] buffer=new byte[64];
        int numOfBytesRead;
        while((numOfBytesRead=in.read(buffer))!=-1)
        {
        out.write(buffer,0,numOfBytesRead);
    }
    out.close();
```

ED - Notepad

File Edit View

```
    in.close();
}
  public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("For encryption enter choice as 1: ");
             System.out.println("For decryption enter choice as 2: ");
            int choice=sc.nextInt();
      File plaintext = new File("java.txt");  //file path which has plain text
      File encrypted = new File("encrypted.txt"); //blank file path which will contain encrypted text after encryption
      if(choice==1)
      {
    try {
        encryptDecrypt("12345678", Cipher.ENCRYPT_MODE, plaintext, encrypted);
        System.out.println("Encryption complete");

    } catch(Exception e) {
        e.printStackTrace();
    }
      }

if(choice==2)
{
File encrypted2=new File("encrypted.txt"); //encrypted file
File decrypted=new File("decrypted.txt"); //empty text file which will contain decrypted text after applying decryption

try
{
      encryptDecrypt("12345678",Cipher.DECRYPT_MODE,encrypted2,decrypted);
      System.out.println("Decryption Complete:");
}
catch(InvalidKeyException | NoSuchAlgorithmException | InvalidKeySpecException | NoSuchPaddingException | IOException e)
{
      e.printStackTrace();
}

}
  }
}
```

Result :

```
Windows PowerShell
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\saksh\OneDrive\Desktop\Java project> javac ED.java
PS C:\Users\saksh\OneDrive\Desktop\Java project> java ED
For encryption enter choice as 1:
For decryption enter choice as 2:
1
Encryption complete
PS C:\Users\saksh\OneDrive\Desktop\Java project> javac ED.java
PS C:\Users\saksh\OneDrive\Desktop\Java project> java ED
For encryption enter choice as 1:
For decryption enter choice as 2:
2
Decryption Complete:
PS C:\Users\saksh\OneDrive\Desktop\Java project>
```

```
Windows PowerShell
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\saksh\OneDrive\Desktop\Java project> javac ED.java
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For encryption enter choice as 1:
For decryption enter choice as 2:
1
Encryption complete
```

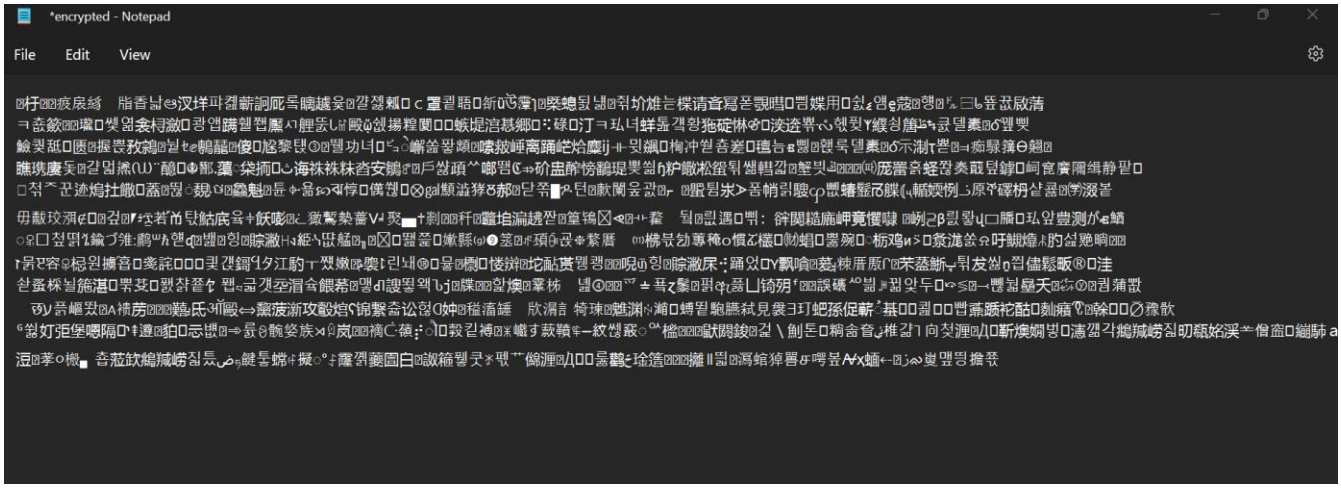

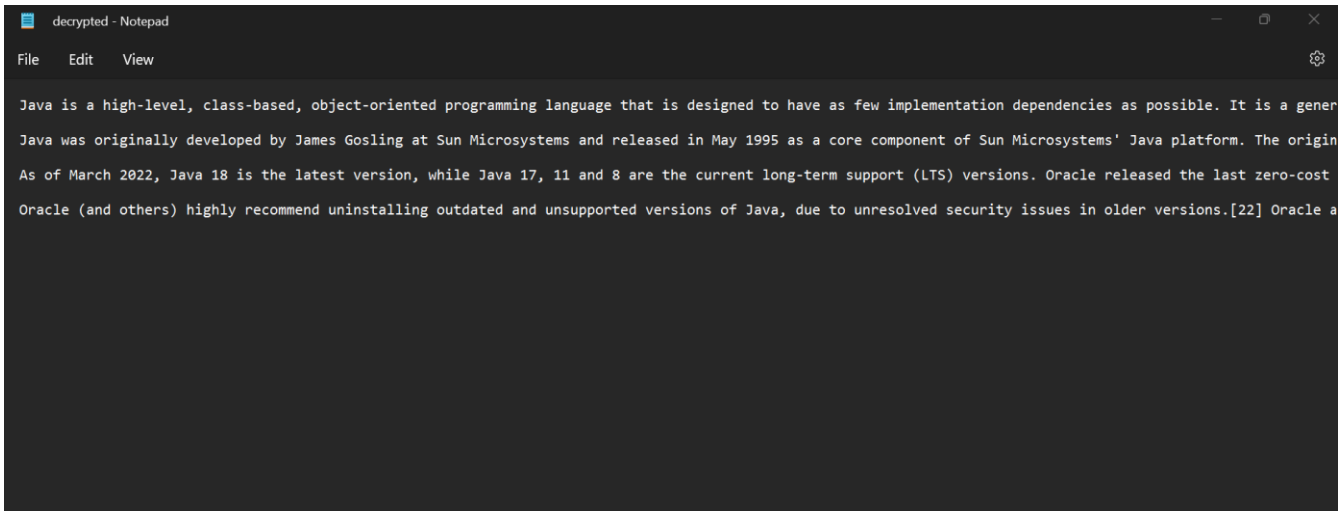


```
PS C:\Users\saksh\OneDrive\Desktop\Java project> javac ED.java
PS C:\Users\saksh\OneDrive\Desktop\Java project> java ED
For encryption enter choice as 1:
For decryption enter choice as 2:
2
Decryption Complete:
PS C:\Users\saksh\OneDrive\Desktop\Java project>
```

Conclusion

AES Java provides a wide range of modes and features for encryption of numerous types of data. It offers authenticity and integrity for encrypted data, Parallel encryption and option for making a cipher stream out of a cipher block. All these modes make it very convenient for java developers to encrypt the data as per their requirements and type of data.

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