1(a). Caesar Cipher

Abdul Rahman S - 7881

```
class caesarCipher {
 public static String encode(String enc, int offset) {
 offset = offset % 26 + 26;
 StringBuilder encoded = new StringBuilder();
 for (char i : enc.toCharArray()) {
 if (Character.isLetter(i)) {
 if (Character.isUpperCase(i)) {
 encoded.append((char) ('A' + (i - 'A' + offset) % 26));
 } else {
 encoded.append((char) ('a' + (i - 'a' + offset) % 26));
 }
 } else {
 encoded.append(i);
 }
 }
return encoded.toString();
 }
 public static String decode(String enc, int offset) {
 return encode(enc, 26 - offset);
 }
 public static void main(String[] args) throws java.lang.Exception {
 String msg = "Transport";
 System.out.println("Simulating Caesar Cipher\n-----------------------");
 System.out.println("Input : " + msg);
 System.out.printf("Encrypted Message : ");
 System.out.println(caesarCipher.encode(msg, 3));
 System.out.printf("Decrypted Message : ");
```

System.out.println(caesarCipher.decode(caesarCipher.encode(msg, 3), 3)); }}

OUTPUT:

1(b).Hill Cipher

Abdul Rahman S - 7881

```
class hillCipher {
 /* 3x3 key matrix for 3 characters at once */
 public static int[][] keymat = new int[][] { { 1, 2, 1 }, { 2, 3, 2 },
 { 2, 2, 1 } }; /* key inverse matrix */
 public static int[][] invkeymat = new int[][] { { -1, 0, 1 }, { 2, -1, 0 }, { -2, 2, -1
} };
 public static String key = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";
 private static String encode(char a, char b, char c) {
 String ret = "";
 int x, y, z;
 int posa = (int) a - 65;
 int posb = (int) b - 65;
 int posc = (int) c - 65;
 x = posa * keymat[0][0] + posb * keymat[1][0] + posc * keymat[2][0];
 y = posa * keymat[0][1] + posb * keymat[1][1] + posc * keymat[2][1];
 z = posa * keymat[0][2] + posb * keymat[1][2] + posc * keymat[2][2];
 a = key.charAt(x % 26);
 b = key.charAt(y % 26);
 c = key.charAt(z % 26);
 ret = "" + a + b + c;
 return ret;
 }
 private static String decode(char a, char b, char c) {
 String ret = "";
 int x, y, z;
 int posa = (int) a - 65;
```

```
 int posb = (int) b - 65;
 int posc = (int) c - 65;
 x = posa * invkeymat[0][0] + posb * invkeymat[1][0] + posc *
invkeymat[2][0];
 y = posa * invkeymat[0][1] + posb * invkeymat[1][1] + posc *
invkeymat[2][1];
 z = posa * invkeymat[0][2] + posb * invkeymat[1][2] + posc *
invkeymat[2][2];
 a = key.charAt((x % 26 < 0) ? (26 + x % 26) : (x % 26));
 b = key.charAt((y % 26 < 0) ? (26 + y % 26) : (y % 26));
 c = key.charAt((z % 26 < 0) ? (26 + z % 26) : (z % 26));
 ret = "" + a + b + c;
 return ret;
 }
 public static void main(String[] args) throws java.lang.Exception {
 String msg;
 String enc = "";
 String dec = "";
 int n;
 msg = ("Information");
 System.out.println("simulation of Hill Cipher\n-------------------------");
 System.out.println("Input message : " + msg);
 msg = msg.toUpperCase();
 msg = msg.replaceAll("\\s", "");
 /* remove spaces */ n = msg.length() % 3;
 /* append padding text X */ if (n != 0) {
 for (int i = 1; i <= (3 - n); i++) {
 msg += 'X';
 }
 }
```

```
System.out.println("padded message : " + msg);
char[] pdchars = msg.toCharArray();
for (int i = 0; i < msg.length(); i += 3) {
enc += encode(pdchars[i], pdchars[i + 1], pdchars[i + 2]);
}
System.out.println("encoded message : " + enc);
char[] dechars = enc.toCharArray();
for (int i = 0; i < enc.length(); i += 3) {
dec += decode(dechars[i], dechars[i + 1], dechars[i + 2]);
}
System.out.println("decoded message : " + dec);
}
}
```

OUTPUT:

1(c). Playfair Cipher

Abdul Rahman S - 7881

```
import java.awt.Point;
class playfairCipher {
 private static char[][] charTable;
 private static Point[] positions;
 private static String prepareText(String s, boolean chgJtoI) {
 s = s.toUpperCase().replaceAll("[^A-Z]", "");
 return chgJtoI ? s.replace("J", "I") : s.replace("Q", "");
 }
 private static void createTbl(String key, boolean chgJtoI) {
 charTable = new char[5][5];
 positions = new Point[26];
 String s = prepareText(key + "ABCDEFGHIJKLMNOPQRSTUVWXYZ",
chgJtoI);
 int len = s.length();
 for (int i = 0, k = 0; i < len; i++) {
 char c = s.charAt(i);
 if (positions[c - 'A'] == null) {
 charTable[k / 5][k % 5] = c;
 positions[c - 'A'] = new Point(k % 5, k / 5);
 k++;
 }
 }
 }
 private static String codec(StringBuilder txt, int dir) {
 int len = txt.length();
 for (int i = 0; i < len; i += 2) {
 char a = txt.charAt(i);
 char b = txt.charAt(i + 1);
```

```
int row1 = positions[a - 'A'].y;
int row2 = positions[b - 'A'].y;
int col1 = positions[a - 'A'].x;
int col2 = positions[b - 'A'].x;
if (row1 == row2) {
col1 = (col1 + dir) % 5;
col2 = (col2 + dir) % 5;
} else if (col1 == col2) {
row1 = (row1 + dir) % 5;
row2 = (row2 + dir) % 5;
} else {
int tmp = col1;
col1 = col2;
col2 = tmp;
}
txt.setCharAt(i, charTable[row1][col1]);
txt.setCharAt(i + 1, charTable[row2][col2]);
}
return txt.toString();
}
private static String encode(String s) {
StringBuilder sb = new StringBuilder(s);
for (int i = 0; i < sb.length(); i += 2) {
if (i == sb.length() - 1) {
sb.append(sb.length() % 2 == 1 ? 'X' : "");
} else if (sb.charAt(i) == sb.charAt(i + 1)) {
sb.insert(i + 1, 'X');
}
}
return codec(sb, 1);
```

```
 }
 private static String decode(String s) {
 return codec(new StringBuilder(s), 4);
 }
 public static void main(String[] args) throws java.lang.Exception {
 String key = "CSE";
 String txt = "Communication Lab"; /* make sure string length is even */ /* change J
to I */
 boolean chgJtoI = true;
 createTbl(key, chgJtoI);
 String enc = encode(prepareText(txt, chgJtoI));
 System.out.println("Simulating Playfair Cipher\n----------------------");
 System.out.println("Input Message : " + txt);
 System.out.println("Encrypted Message : " + enc);
 System.out.println("Decrypted Message : " + decode(enc));
 }
}
```

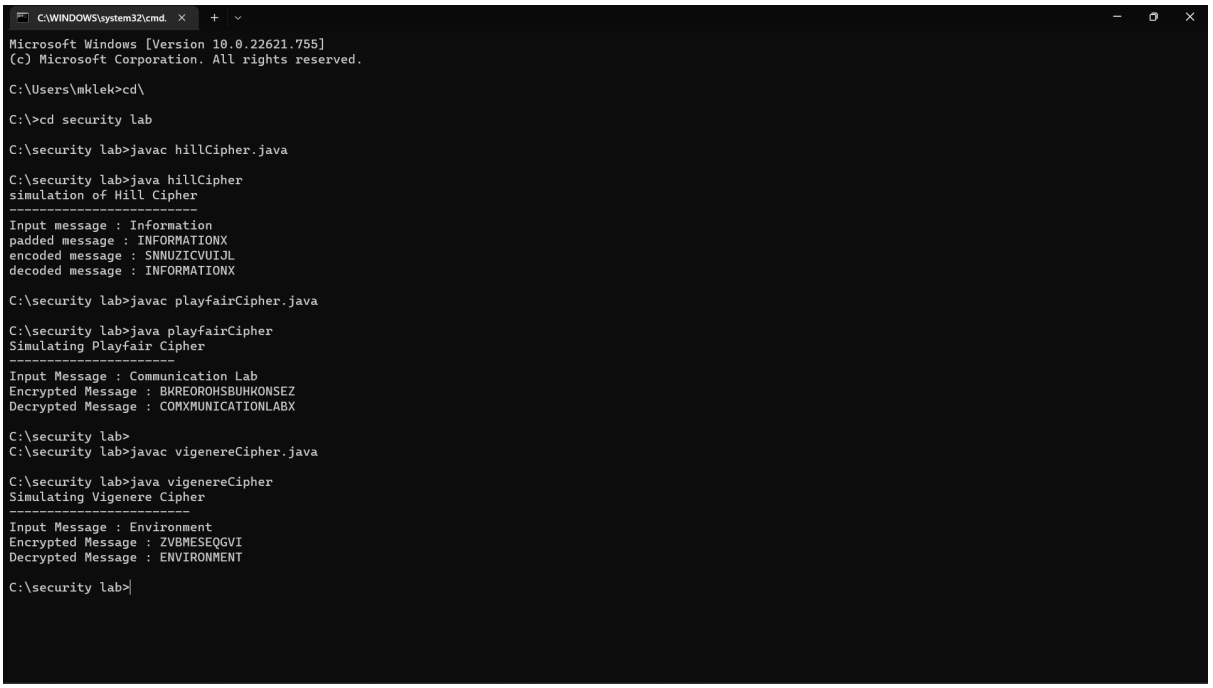
1d. Vigenere Cipher

Abdul Rahman S - 7881

```
public class vigenereCipher {
 static String encode(String text, final String key) {
 String res = "";
 text = text.toUpperCase();
 for (int i = 0, j = 0; i < text.length(); i++) {
 char c = text.charAt(i);
 if (c < 'A' || c > 'Z') {
 continue;
 }
 res += (char) ((c + key.charAt(j) - 2 * 'A') % 26 + 'A');
 j = ++j % key.length();
 }
 return res;
 }
 static String decode(String text, final String key) {
 String res = "";
 text = text.toUpperCase();
 for (int i = 0, j = 0; i < text.length(); i++) {
 char c = text.charAt(i);
 if (c < 'A' || c > 'Z') {
 continue;
 }
 res += (char) ((c - key.charAt(j) + 26) % 26 + 'A');
 j = ++j % key.length();
 }
 return res;
 }
```

```
public static void main(String[] args) throws java.lang.Exception {
String key = "VIGENERECIPHER";
String msg = "Environment";
System.out.println("Simulating Vigenere Cipher\n------------------------");
System.out.println("Input Message : " + msg);
String enc = encode(msg, key);
System.out.println("Encrypted Message : " + enc);
System.out.println("Decrypted Message : " + decode(enc, key));
}
}
```

OUTPUT:



2(a).Rail Fence Cipher Transposition Technique

Abdul Rahman S - 7881

```
import java.util.*;
class RailFenceBasic{
 int depth;
 String Encryption(String plainText,int depth)throws Exception
 {
  int r=depth,len=plainText.length();
  int c=len/depth;
  char mat[][]=new char[r][c];
  int k=0;

  String cipherText="";

  for(int i=0;i< c;i++)
  {
   for(int j=0;j< r;j++)
   {
    if(k!=len)
     mat[j][i]=plainText.charAt(k++);
    else
     mat[j][i]='X';
   }
  }
  for(int i=0;i< r;i++)
  {
   for(int j=0;j< c;j++)
   {
    cipherText+=mat[i][j];
   }
  }
  return cipherText;
 }


 String Decryption(String cipherText,int depth)throws Exception
 {
  int r=depth,len=cipherText.length();
  int c=len/depth;
  char mat[][]=new char[r][c];
  int k=0;

  String plainText="";
```

```
  for(int i=0;i< r;i++)
  {
   for(int j=0;j< c;j++)
   {
    mat[i][j]=cipherText.charAt(k++);
   }
  }
  for(int i=0;i< c;i++)
  {
   for(int j=0;j< r;j++)
   {
    plainText+=mat[j][i];
   }
  }

  return plainText;
 }
}

class RailFence{
 public static void main(String args[])throws Exception
 {
  RailFenceBasic rf=new RailFenceBasic();
                Scanner scn=new Scanner(System.in);
                int depth;

                String plainText,cipherText,decryptedText;

                System.out.println("Enter plain text:");
                plainText=scn.nextLine();

                System.out.println("Enter depth for Encryption:");
                depth=scn.nextInt();

  cipherText=rf.Encryption(plainText,depth);
  System.out.println("Encrypted text is:\n"+cipherText);

                decryptedText=rf.Decryption(cipherText, depth);

  System.out.println("Decrypted text is:\n"+decryptedText);

 }
}
```

OUTPUT:


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.22000.856]
(c) Microsoft Corporation. All rights reserved.
C:\Users\mklek>cd\
C:\>cd security lab
C:\security lab>javac railfence.java
C:\security lab>java railfence
Input String : DEPARTMENT
Ciphered Text : DPRMNEATET
C:\security lab>

2(b).Row and Column Transformation Technique

Abdul Rahman S - 7881

```
import java.util.*;
class TransCipher {
 public static void main(String args[]) {
 Scanner sc = new Scanner(System.in);
 System.out.println("Enter the plain text");
 String pl = sc.nextLine();
 sc.close();
 String s = "";
 int start = 0;
 for (int i = 0; i < pl.length(); i++) {
 if (pl.charAt(i) == ' ') {
 s = s + pl.substring(start, i);
 start = i + 1;
 }
 }
 s = s + pl.substring(start);
System.out.print(s);
 System.out.println();
 int k = s.length();
 int l = 0;
 int col = 4;
 int row = s.length() / col;
 char ch[][] = new char[row][col];
 for (int i = 0; i < row; i++) {
 for (int j = 0; j < col; j++) {
 if (l < k) {
 ch[i][j] = s.charAt(l);
```

```
l++;
} else {
ch[i][j] = '#';
}
}
}
char trans[][] = new char[col][row];
for (int i = 0; i < row; i++) {
for (int j = 0; j < col; j++) {
trans[j][i] = ch[i][j];
}
}
for (int i = 0; i < col; i++) {
for (int j = 0; j < row; j++) {
System.out.print(trans[i][j]);
}
}
System.out.println();
}
}
```

OUTPUT:


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.22000.856]
(c) Microsoft Corporation. All rights reserved.
C:\Users\mklek>cd\
C:\>cd security lab
C:\security lab>javac TransCipher.java
C:\security lab>java TransCipher
Enter the plain text
ARRANGED
ARRANGED
ANRGREAD
C:\security lab>

3.Data Encryption Standard (DES) Algorithm (User Message Encryption)

Abdul Rahman S - 7881

```
import java.security.InvalidKeyException;
import java.security.NoSuchAlgorithmException;
import javax.crypto.BadPaddingException;
import javax.crypto.Cipher;
import javax.crypto.IllegalBlockSizeException;
import javax.crypto.KeyGenerator;
import javax.crypto.NoSuchPaddingException;
import javax.crypto.SecretKey;
public class DES
{
public static void main(String[] argv) {
try{
 System.out.println("Message Encryption Using DES Algorithm\n-------");
 KeyGenerator keygenerator = KeyGenerator.getInstance("DES");
 SecretKey myDesKey = keygenerator.generateKey();
 Cipher desCipher;
desCipher = Cipher.getInstance("DES/ECB/PKCS5Padding");
 desCipher.init(Cipher.ENCRYPT_MODE, myDesKey);
 byte[] text = "Secret Information ".getBytes();
 System.out.println("Message [Byte Format] : " + text);
 System.out.println("Message : " + new String(text));
 byte[] textEncrypted = desCipher.doFinal(text);
 System.out.println("Encrypted Message: " + textEncrypted);
 desCipher.init(Cipher.DECRYPT_MODE, myDesKey);
 byte[] textDecrypted = desCipher.doFinal(textEncrypted);
 System.out.println("Decrypted Message: " + new
String(textDecrypted));
```

```
}catch(NoSuchAlgorithmException e){
e.printStackTrace();
}catch(NoSuchPaddingException e){
e.printStackTrace();
}catch(InvalidKeyException e){
e.printStackTrace();
}catch(IllegalBlockSizeException e){
e.printStackTrace();
}catch(BadPaddingException e){
e.printStackTrace();
}
}
}
```

OUTPUT:

4. Advanced Encryption Standard (DES) Algorithm (URL Encryption)

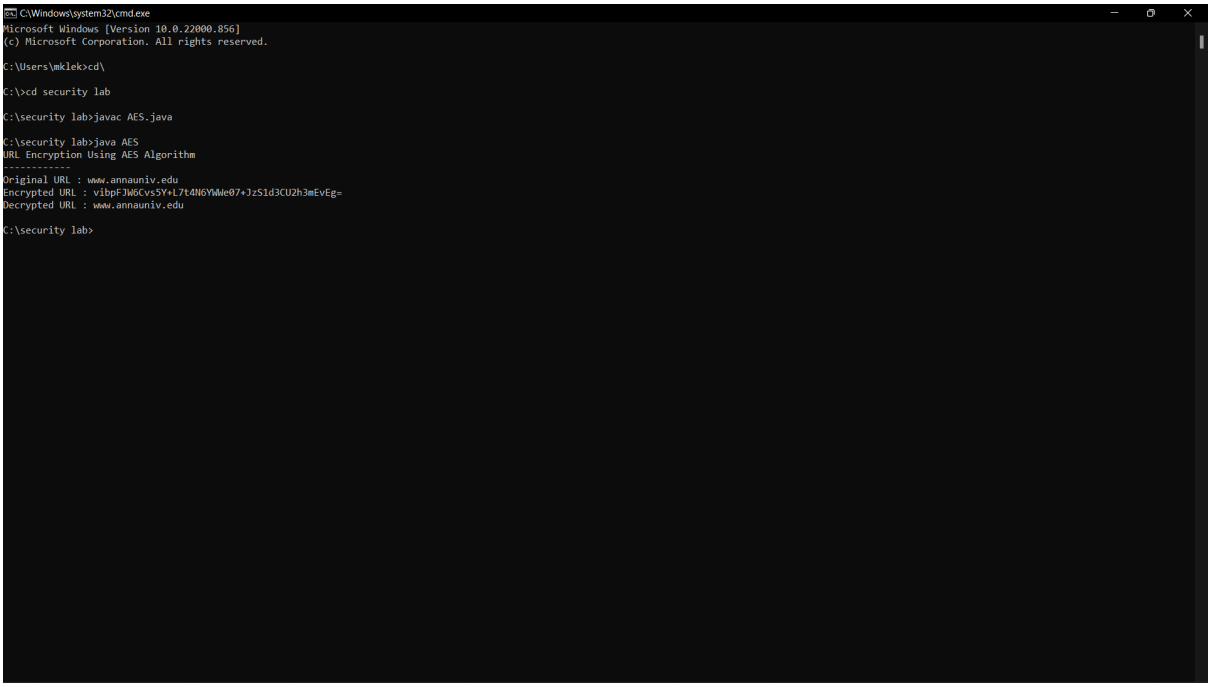
Abdul Rahman S - 7881

```
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 = "annaUniversity";
 String originalString = "www.annauniv.edu";
 String encryptedString = AES.encrypt(originalString, secretKey);
 String decryptedString = AES.decrypt(encryptedString, secretKey);
System.out.println("URL Encryption Using AES Algorithm\n------------");
 System.out.println("Original URL : " + originalString);
 System.out.println("Encrypted URL : " + encryptedString);
 System.out.println("Decrypted URL : " + decryptedString);
```

```
    }
}
```

OUTPUT:


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.22000.856]
(c) Microsoft Corporation. All rights reserved.
C:\Users\mklek>cd\
C:\>cd security lab
C:\security lab>javac AES.java
C:\security lab>java AES
URL Encryption Using AES Algorithm
Original URL : www.annauniv.edu
Encrypted URL : v1bpFJW6CvsSY+L7t4N6YWWe07+JzS1d3CU2h3mEvEg=
Decrypted URL : www.annauniv.edu
C:\security lab>

5. RSA Algorithm

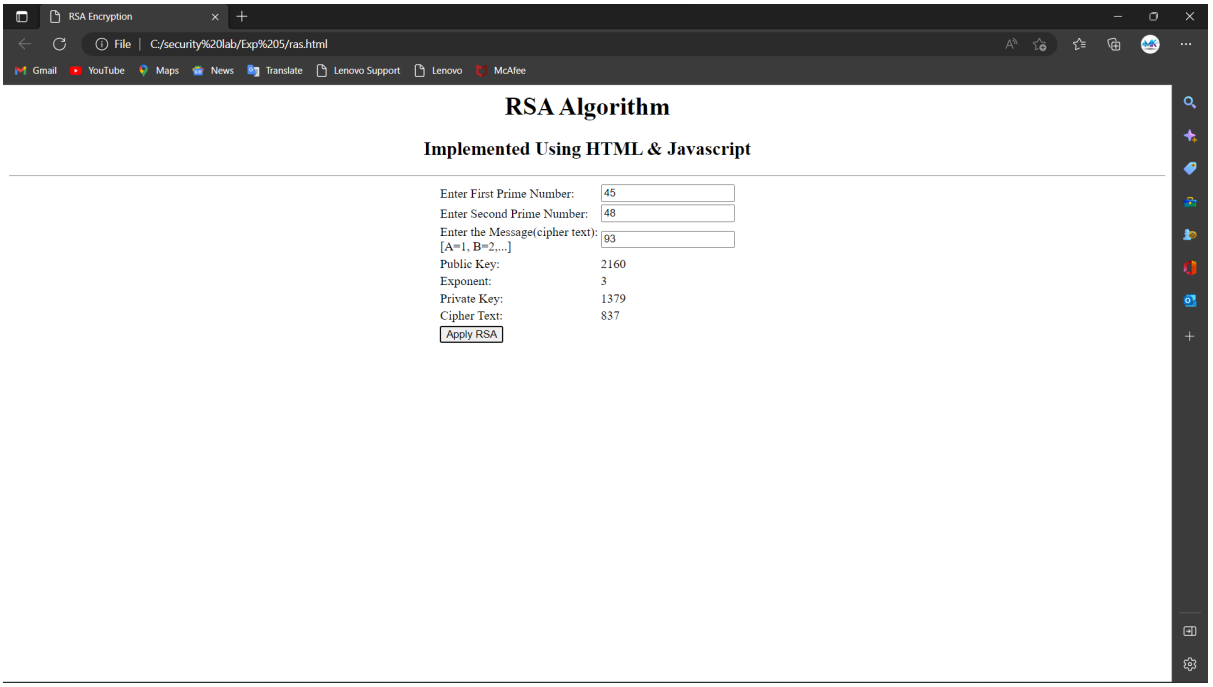
Abdul Rahman S - 7881

```
<html>
<head>
 <title>RSA Encryption</title>
 <meta name="viewport" content="width=device-width, initial-scale=1.0">
</head>
<body>
 <center>
 <h1>RSA Algorithm</h1>
 <h2>Implemented Using HTML & Javascript</h2>
 <hr>
 <table>
 <tr>
 <td>Enter First Prime Number:</td>
 <td><input type="number" value="53" id="p"></td>
 </tr>
 <tr>
 <td>Enter Second Prime Number:</td>
 <td><input type="number" value="59" id="q"></p>
 </td>
 </tr>
 <tr>
 <td>Enter the Message(cipher text):<br>[A=1, B=2,...]</td>
 <td><input type="number" value="89" id="msg"></p>
 </td>
 </tr>
 <tr>
 <td>Public Key:</td>
```

```
<td>
<p id="publickey"></p>
</td>
</tr>
<tr>
<td>Exponent:</td>
<td>
<p id="exponent"></p>
</td>
</tr>
<tr>
<td>Private Key:</td>
<td>
<p id="privatekey"></p>
</td>
</tr>
<tr>
<td>Cipher Text:</td>
<td>
<p id="ciphertext"></p>
</td>
</tr>
<tr>
<td><button onclick="RSA();">Apply RSA</button></td>
</tr>
</table>
</center>
</body>
<script type="text/javascript">
 function RSA() {
```

```
var gcd, p, q, no, n, t, e, i, x;
gcd = function (a, b) { return (!b) ? a : gcd(b, a % b); };
p = document.getElementById('p').value;
q = document.getElementById('q').value;
no = document.getElementById('msg').value;
n = p * q;
t = (p - 1) * (q - 1);
for (e = 2; e < t; e++) {
if (gcd(e, t) == 1) {
break;
}
}
for (i = 0; i < 10; i++) {
x = 1 + i * t
if (x % e == 0) {
d = x / e;
break;
}
}
ctt = Math.pow(no, e).toFixed(0);
ct = ctt % n;
dtt = Math.pow(ct, d).toFixed(0);
dt = dtt % n;
document.getElementById('publickey').innerHTML = n;
document.getElementById('exponent').innerHTML = e;
document.getElementById('privatekey').innerHTML = d;
document.getElementById('ciphertext').innerHTML = ct;
}
</script>
</html>
```

OUTPUT:


RSA Encryption
File | C:/security%20lab/Exp%205/ras.html
Gmail
YouTube
Maps
News
Translate
Lenovo Support
Lenovo
McAfee
RSA Algorithm
Implemented Using HTML & Javascript
Enter First Prime Number:
45
Enter Second Prime Number:
48
Enter the Message(cipher text):
[A=1, B=2,...]
93
Public Key:
2160
Exponent:
3
Private Key:
1379
Cipher Text:
837
Apply RSA

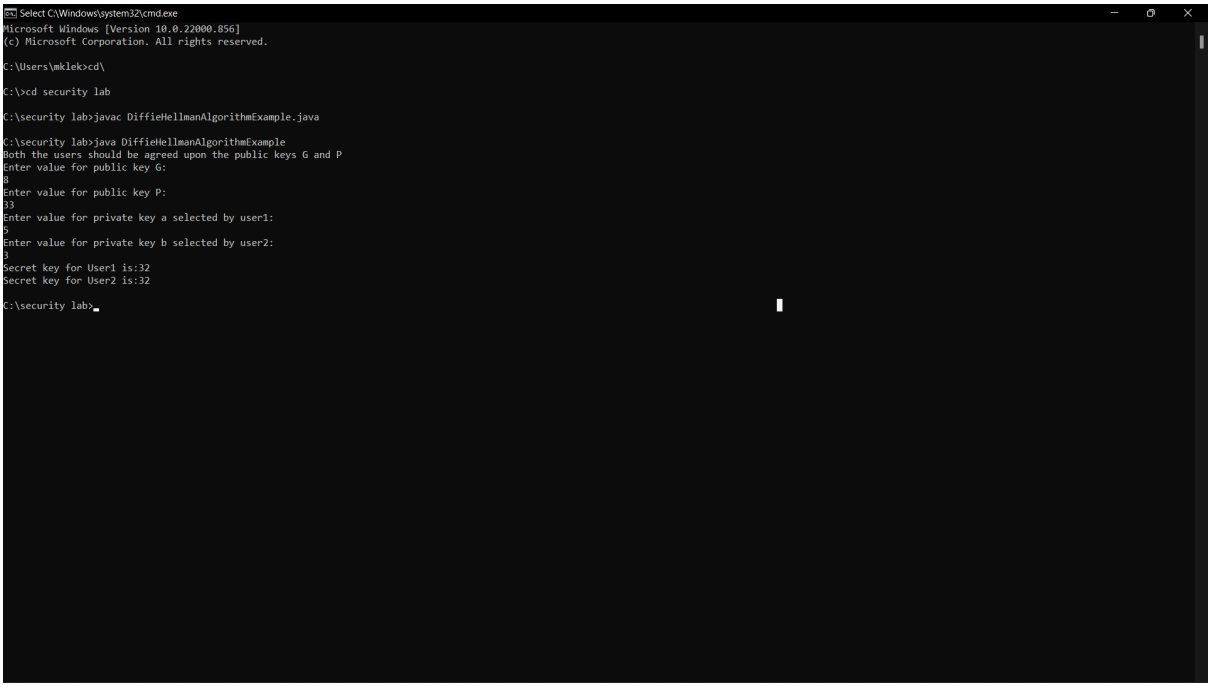
6 . Diffie-Hellman key exchange algorithm

(S. Manoj Kumar-7577)

```
import java.util.*;
class DiffieHellmanAlgorithmExample {
    public static void main(String[] args)
    {
        long P, G, x, a, y, b, ka, kb;
        Scanner sc = new Scanner(System.in);
        System.out.println("Both the users should be agreed upon the public keys G and P");
        System.out.println("Enter value for public key G:");
        G = sc.nextLong();
        System.out.println("Enter value for public key P:");
        P = sc.nextLong();
        System.out.println("Enter value for private key a selected by user1:");
        a = sc.nextLong();
        System.out.println("Enter value for private key b selected by user2:");
        b = sc.nextLong();
        x = calculatePower(G, a, P);
        y = calculatePower(G, b, P);
        ka = calculatePower(y, a, P);
        kb = calculatePower(x, b, P);
        System.out.println("Secret key for User1 is:" + ka);
        System.out.println("Secret key for User2 is:" + kb);
    }
    private static long calculatePower(long x, long y, long P)
    {
        long result = 0;
        if (y == 1){
            return x;
        }
```

```
        else{
            result = ((long)Math.pow(x, y)) % P;
            return result;
        }
    }
}
```

OUTPUT:



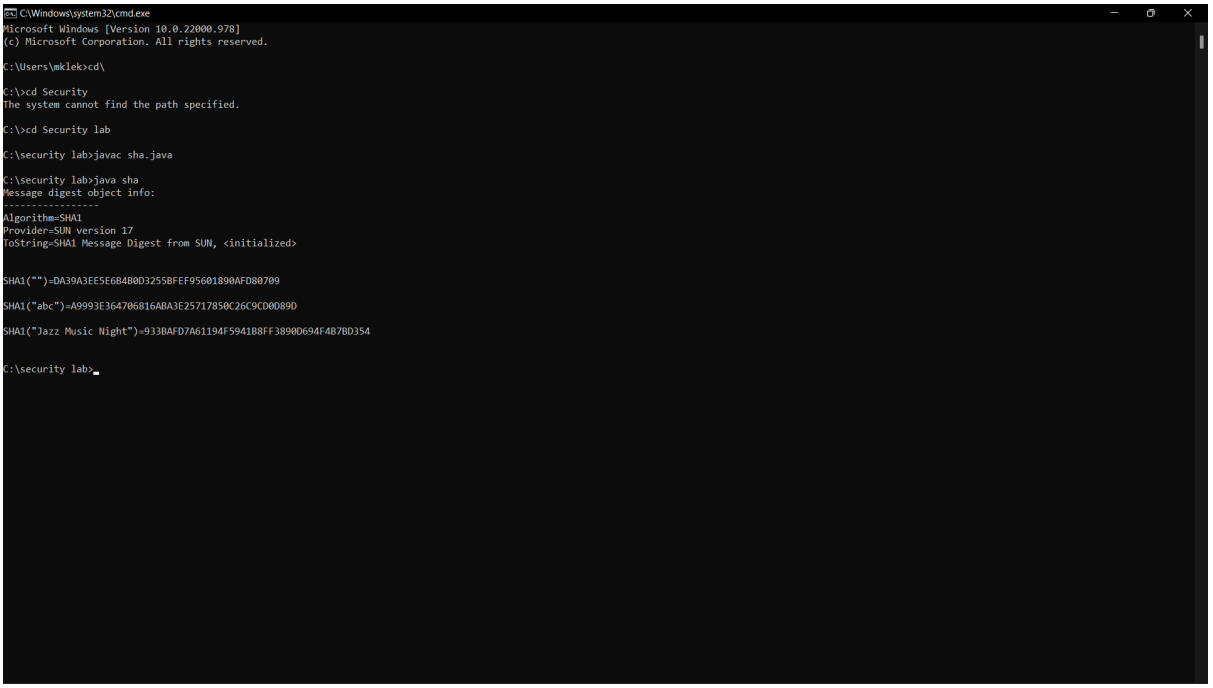
7. SHA-1 Algorithm

Abdul Rahman S - 7881

```
import java.security.*;
public class sha {
 public static void main(String[] a) {
 try {
 MessageDigest md = MessageDigest.getInstance("SHA1");
 System.out.println("Message digest object info:\n----------------");
 System.out.println("Algorithm=" + md.getAlgorithm());
 System.out.println("Provider=" + md.getProvider());
 System.out.println("ToString=" + md.toString());
 String input = "";
 md.update(input.getBytes());
 byte[] output = md.digest();
 System.out.println();
 System.out.println("SHA1(\"" + input + "\")=" + bytesToHex(output));
 input = "abc";
 md.update(input.getBytes());
 output = md.digest();
 System.out.println();
 System.out.println("SHA1(\"" + input + "\")=" + bytesToHex(output));
 input = "Jazz Music Night";
 md.update(input.getBytes());
 output = md.digest();
 System.out.println();
 System.out.println("SHA1(\"" + input + "\")=" + bytesToHex(output));
 System.out.println();
 } catch (Exception e) {
 System.out.println("Exception:" + e);
```

```
}
}
private static String bytesToHex(byte[] b) {
char hexDigit[] = { '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', 'A', 'B', 'C', 'D', 'E', 'F' };
StringBuffer buf = new StringBuffer();
for (byte aB : b) {
buf.append(hexDigit[(aB >> 4) & 0x0f]);
buf.append(hexDigit[aB & 0x0f]);
}
return buf.toString();
}
}
```

OUTPUT:



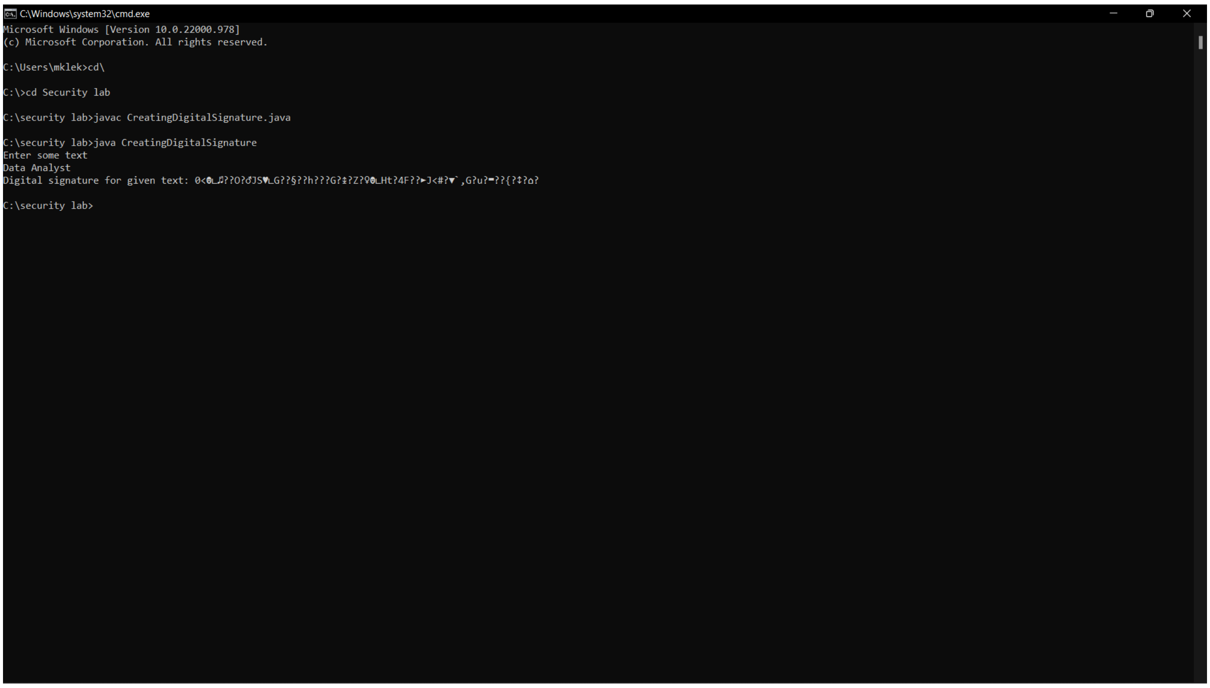
8. Digital Signature Standard

Abdul Rahman S - 7881

```
import java.security.KeyPair;
import java.security.KeyPairGenerator;
import java.security.PrivateKey;
import java.security.Signature;
import java.util.Scanner;
public class CreatingDigitalSignature {
 public static void main(String args[]) throws Exception {
 Scanner sc = new Scanner(System.in);
 System.out.println("Enter some text");
 String msg = sc.nextLine();

 KeyPairGenerator keyPairGen = KeyPairGenerator.getInstance("DSA");

 keyPairGen.initialize(2048);
 KeyPair pair = keyPairGen.generateKeyPair();

 PrivateKey privKey = pair.getPrivate();

 Signature sign = Signature.getInstance("SHA256withDSA");
 sign.initSign(privKey);
 byte[] bytes = "msg".getBytes();

 sign.update(bytes);

 byte[] signature = sign.sign();

 System.out.println("Digital signature for given text: "+new String(signature,
```

```
"UTF8"));
 }
}
```

OUTPUT:


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.22000.978]
(c) Microsoft Corporation. All rights reserved.
C:\Users\mklek>cd\
C:\>cd Security lab
C:\security lab>javac CreatingDigitalSignature.java
C:\security lab>java CreatingDigitalSignature
Enter some text
Data Analyst
Digital signature for given text: 0<☻∟♫??O?♂JS♥∟G??§??h???G?↨?Z?♀☻∟Ht?4F??►J<#?▼`,G?u?▬??{?↕?⌂?
C:\security lab>

9. Demonstration of Intrusion Detection System(IDS)

Abdul Rahman S - 7881

1. Download Snort from the Snort.org website.

2. Download Rules. must register to get the rules.

3. Double-click on the .exe to install snort.

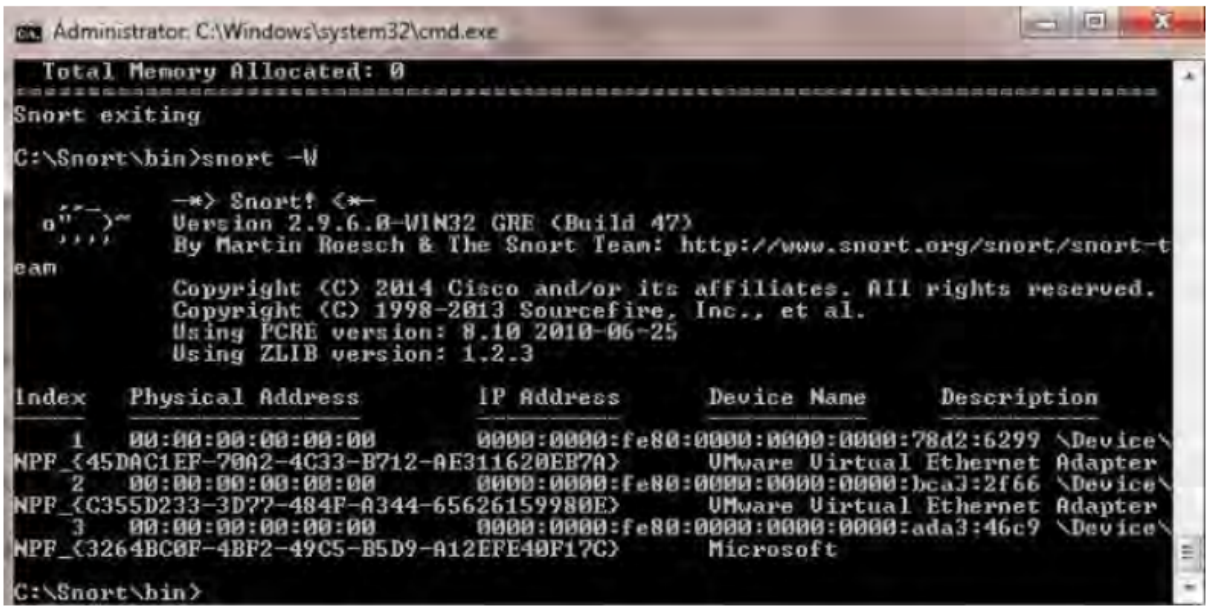
4. Extract the Rules file. will need WinRAR for the .gz file.

5. Copy all files from the “rules” folder of the extracted folder. Now paste the rules into the “C:\Snort\rules” folder.

6. Copy the “snort. conf” file from the “etc” folder of the extracted folder. must paste it into the “C:\Snort\etc” folder.

7. Open a command prompt (cmd.exe) and navigate to the folder “C:\Snort\bin” folder. (at the Prompt, type cd\snort\bin)

8. To start (execute) snort in sniffer mode use the following command: snort -dev -i 3 -i Indicates the interface number.



9. To run snort in IDS mode, will need to configure the file “snort. conf” according to r network environment.

10. To specify the network address that want to protect in snort.conf file, look for the following line.

11. To set the addresses of DNS_SERVERS if have some on r network.

12. Change the RULE_PATH variable to the path of the rules folder. var RULE_PATH c:\snort\rules.

13. Change the path of all library files with the name and path on r system. and must change the path of snort_dynamicpreprocessorvariable.

14. Change the path of the “dynamic engine” variable value in the “snort. conf” file.

15 Add the paths for the “include classification. config” and “include reference. config” files.

16. Remove the comment (#) on the line to allow ICMP rules, if it is commented with a #.

17. The comment of the ICMP-info rules comment if it is commented.

18. To add log files to store alerts generated by snort, search for the “output log” test in snort. conf and add the following line:

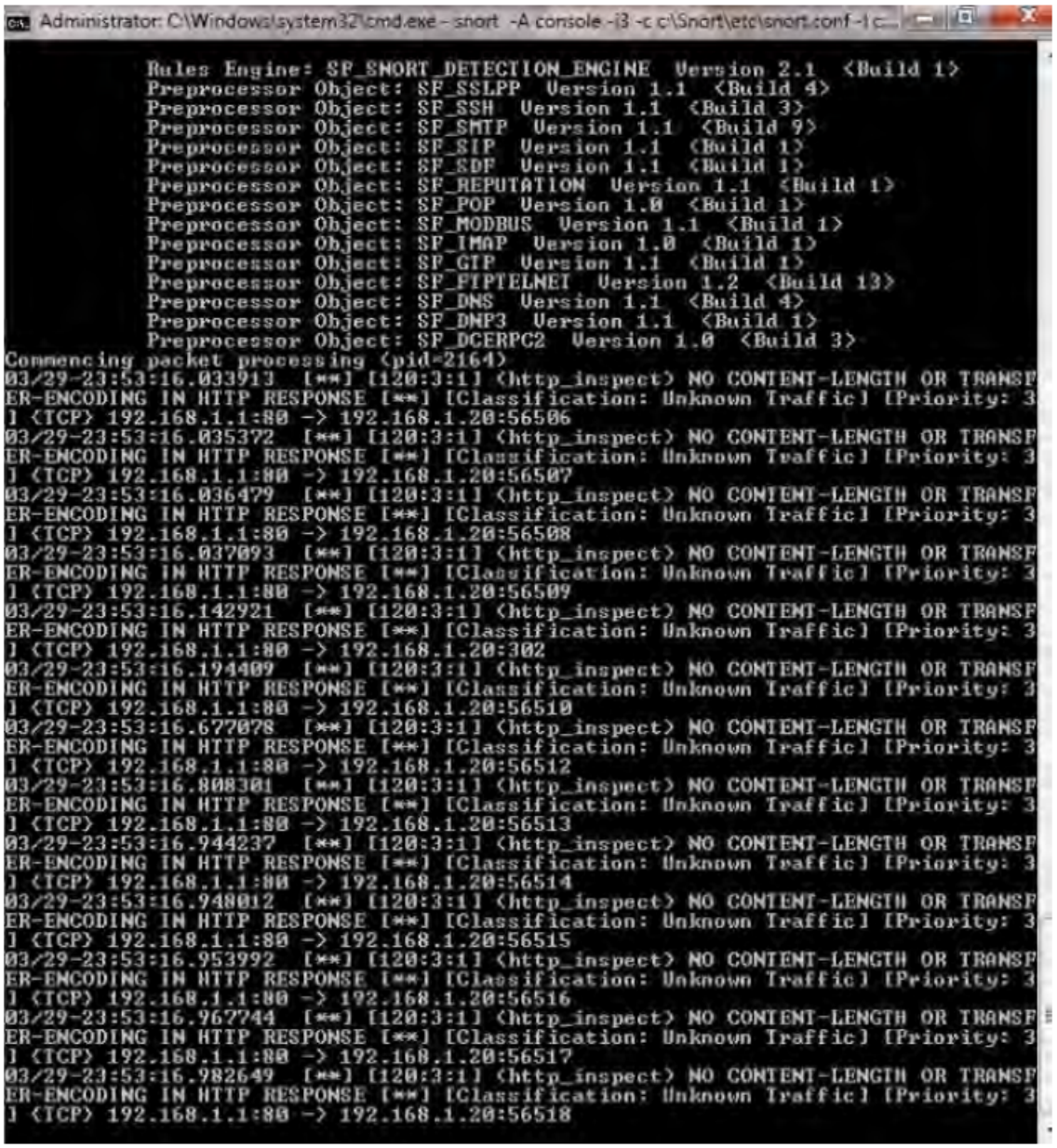
19. Comment (add a #) the whitelist $WHITE_LIST_PATH/white_list.rules and the blacklist

20. Comment out (#) the following lines:

21. Save the “snort. conf” file.

22. To start snort in IDS mode, run the following command:

23. Scan the computer running snort from another computer using PING or NMap (ZenMap).


Administrator: C:\Windows\system32\cmd.exe - snort -A console -i3 -c c:\Snort\etc\snort.conf -l c...
Rules Engine: SF_SNORT_DETECTION_ENGINE Version 2.1 <Build 1>
Preprocessor Object: SF_SSLPP Version 1.1 <Build 4>
Preprocessor Object: SF_SSH Version 1.1 <Build 3>
Preprocessor Object: SF_SMTP Version 1.1 <Build 9>
Preprocessor Object: SF_SIP Version 1.1 <Build 1>
Preprocessor Object: SF_SDF Version 1.1 <Build 1>
Preprocessor Object: SF_REPUTATION Version 1.1 <Build 1>
Preprocessor Object: SF_POP Version 1.0 <Build 1>
Preprocessor Object: SF_MODBUS Version 1.1 <Build 1>
Preprocessor Object: SF_IMAP Version 1.0 <Build 1>
Preprocessor Object: SF_GTP Version 1.1 <Build 1>
Preprocessor Object: SF_FTPTELNET Version 1.2 <Build 13>
Preprocessor Object: SF_DNS Version 1.1 <Build 4>
Preprocessor Object: SF_DNP3 Version 1.1 <Build 1>
Preprocessor Object: SF_DCERPC2 Version 1.0 <Build 3>
Commencing packet processing (pid=2164)
03/29-23:53:16.033913 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56506
03/29-23:53:16.035372 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56507
03/29-23:53:16.036479 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56508
03/29-23:53:16.037093 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56509
03/29-23:53:16.142921 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:302
03/29-23:53:16.194409 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56510
03/29-23:53:16.677078 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56512
03/29-23:53:16.808301 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56513
03/29-23:53:16.944237 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56514
03/29-23:53:16.948012 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56515
03/29-23:53:16.953992 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56516
03/29-23:53:16.967744 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56517
03/29-23:53:16.982649 [**] [120:3:1] (http_inspect) NO CONTENT-LENGTH OR TRANSF
ER-ENCODING IN HTTP RESPONSE [**] [Classification: Unknown Traffic] [Priority: 3
] {TCP} 192.168.1.1:80 -> 192.168.1.20:56518

10. Exploring N-Stalker, a Vulnerability Assessment Tool

Abdul Rahman S - 7881

1. Start N-Stalker from a Windows computer. The program is installed under Start ➪ Programs ➪ N-Stalker ➪ N-Stalker Free Edition.

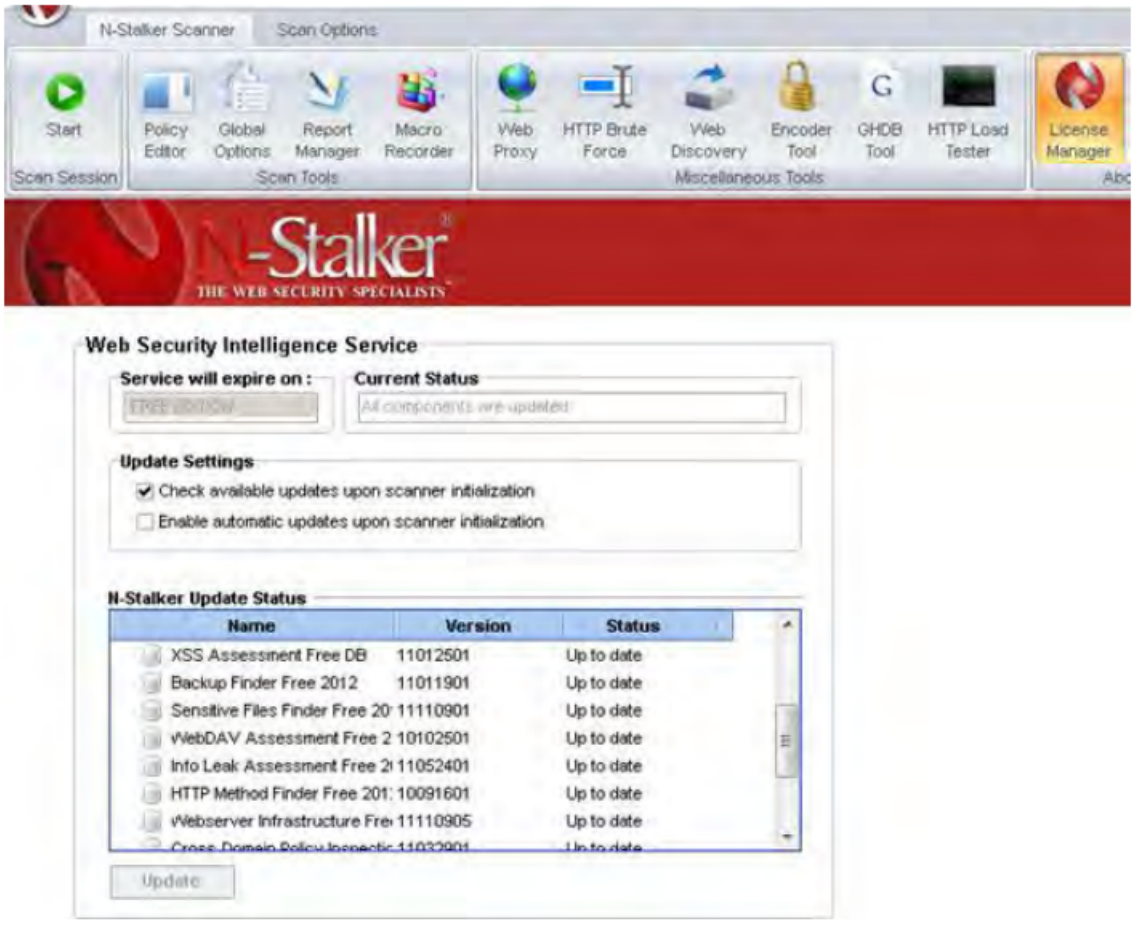
2. Enter a host address or a range of addresses to scan.

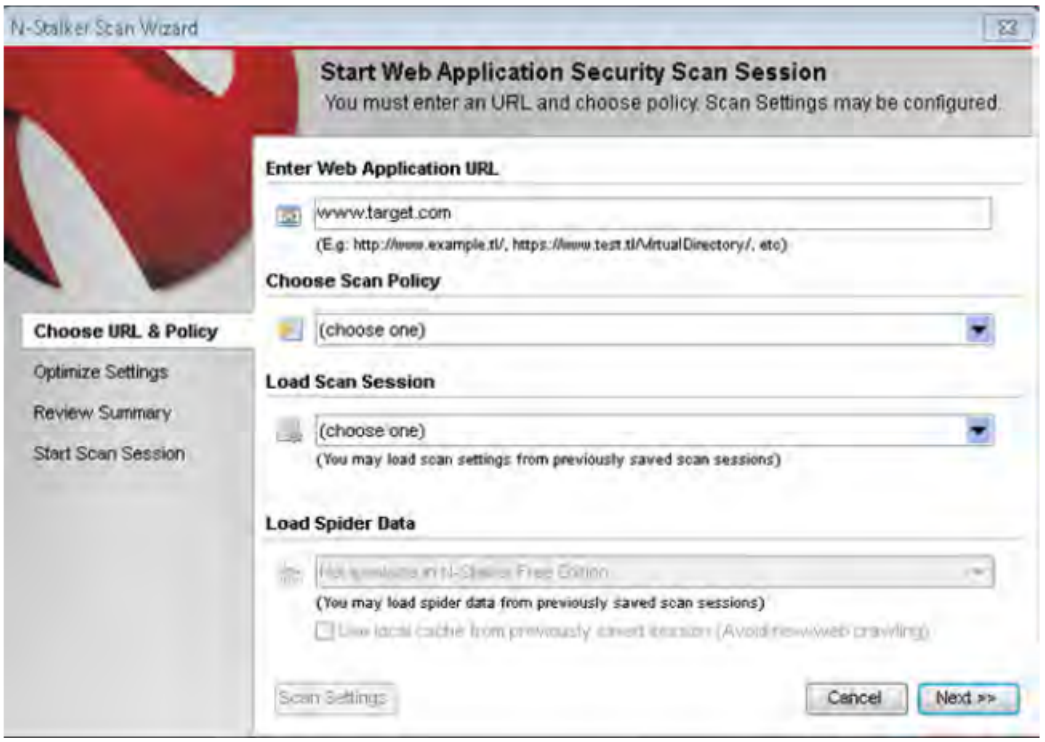
3. Click Start Scan.

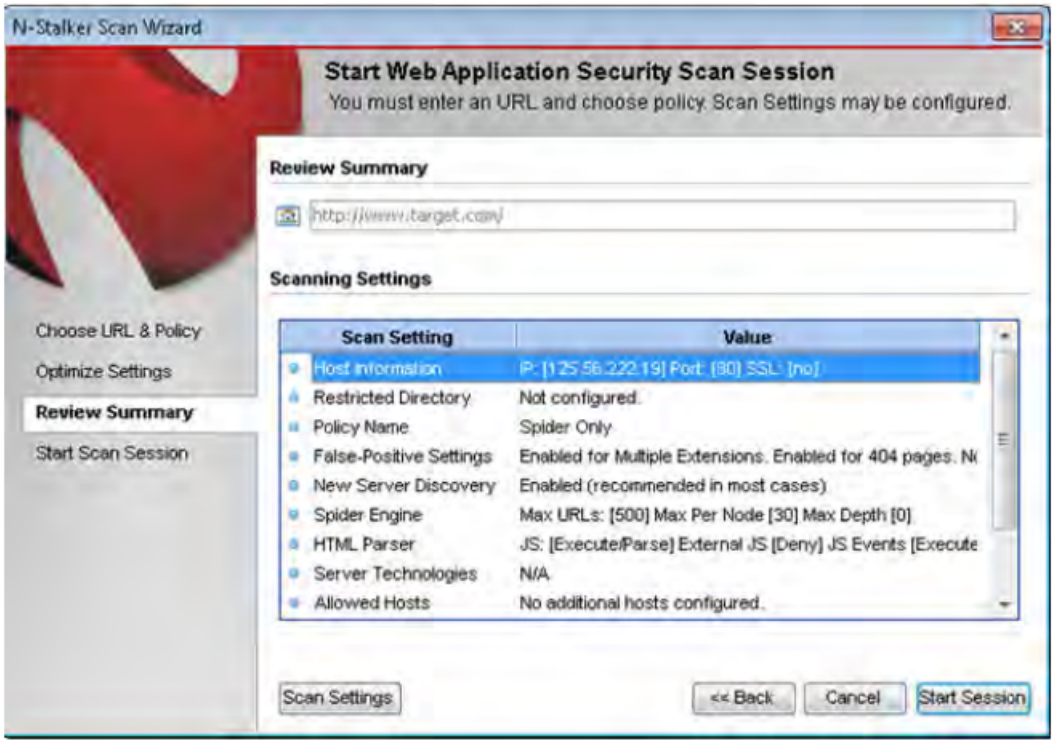
4. After the scan completes, the N-Stalker Report Manager will prompt

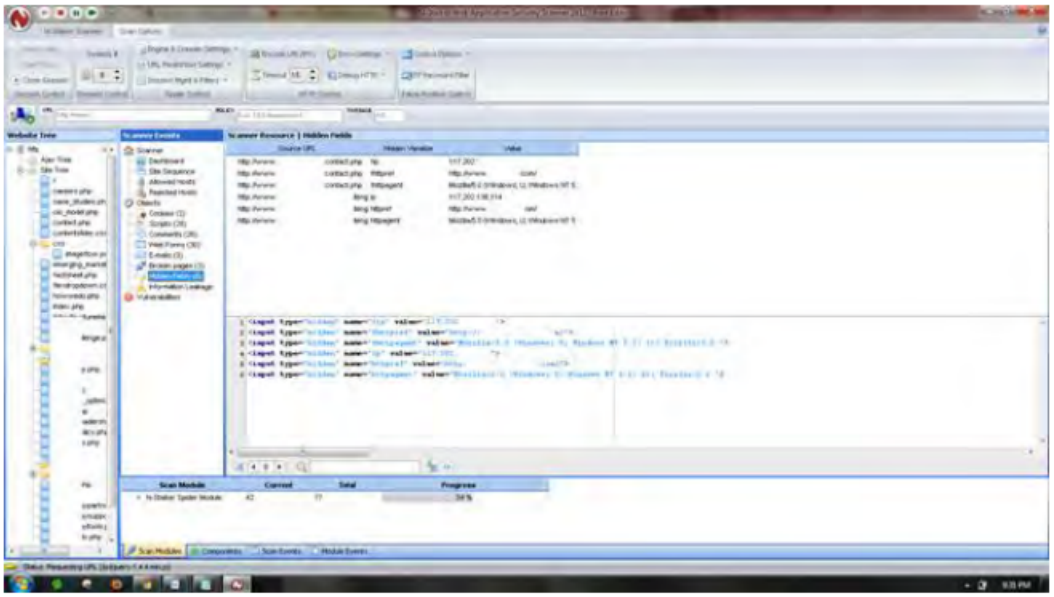
5. To select a format for the resulting report and choose to Generate HTML.

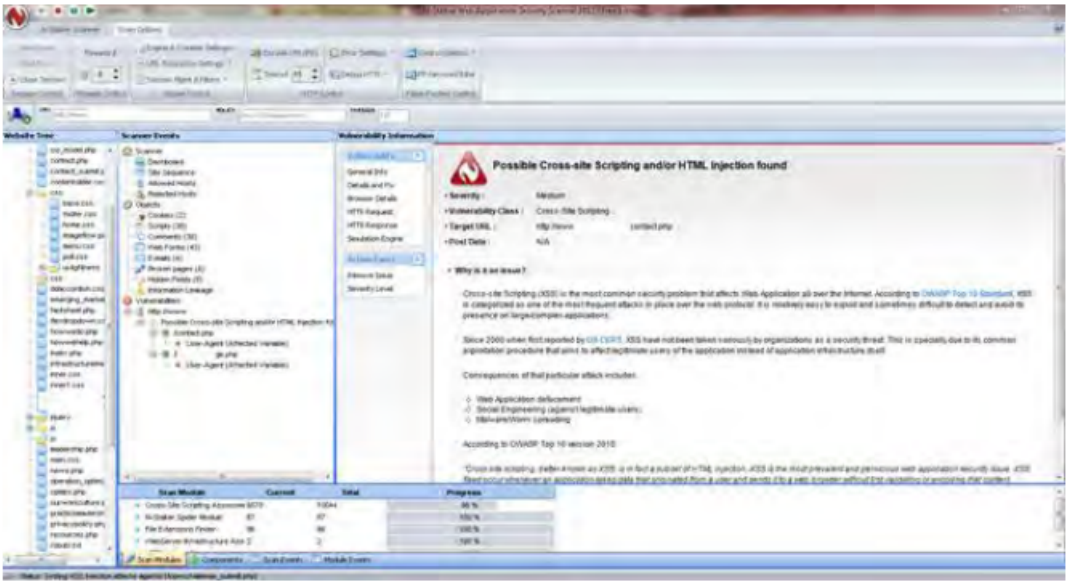
6. Review the HTML report for vulnerabilities.




N-Stalker Scan Wizard
Start Web Application Security Scan Session
You must enter an URL and choose policy. Scan Settings may be configured.
Enter Web Application URL
www.target.com
(E.g: http://www.example.tl/, https://www.test.tl/VirtualDirectory/, etc)
Choose Scan Policy
(choose one)
Load Scan Session
(choose one)
(You may load scan settings from previously saved scan sessions)
Load Spider Data
(You may load spider data from previously saved scan sessions)
Choose URL & Policy
Optimize Settings
Review Summary
Start Scan Session
Scan Settings
Cancel
Next >>


N-Stalker Scan Wizard
Start Web Application Security Scan Session
You must enter an URL and choose policy. Scan Settings may be configured.
Review Summary
http://www.target.com/
Scanning Settings
Scan Setting
Value
Host Information
Restricted Directory
Not configured.
Policy Name
Spider Only
False-Positive Settings
New Server Discovery
Enabled (recommended in most cases)
Spider Engine
Max URLs: [500] Max Per Node [30] Max Depth [0]
HTML Parser
Server Technologies
N/A
Allowed Hosts
No additional hosts configured.
Choose URL & Policy
Optimize Settings
Review Summary
Start Scan Session
Scan Settings
<< Back
Cancel
Start Session




Possible Cross-site Scripting and/or HTML injection found

11(a) Defeating Malware - Building Trojans

Abdul Rahman S - 7881

TROJAN:

- In computing, a Trojan horse,or trojan, is any malware which misleads users of its true intent.
- Trojans are generally spread by some form of social engineering, for example where a user is duped into executing an email attachment disguised to appear not suspicious, (e.g., a routine form to be filled in), or by clicking on some fake advertisement on social media or anywhere else.
- Although their payload can be anything, many modern forms act as a backdoor, contacting a controller which can then have unauthorized access to the affected computer.
- Trojans may allow an attacker to access users' personal information such as banking information, passwords, or personal identity.
- **Example:** Ransomware attacks are often carried out using a trojan.

CODE:

Trojan.bat

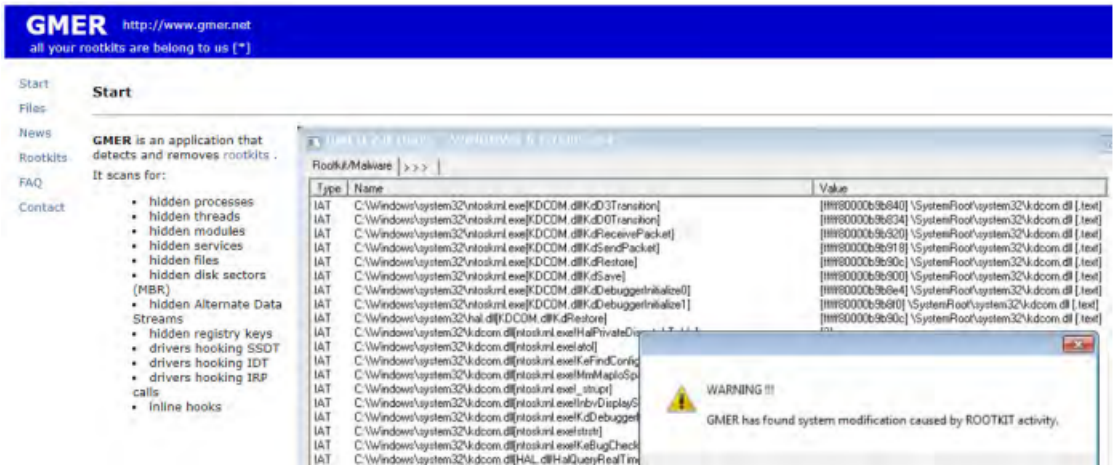
```
@echo off
 :x
start mspaint
start notepad
start cmd
start explorer
start control
start calc
goto x
```

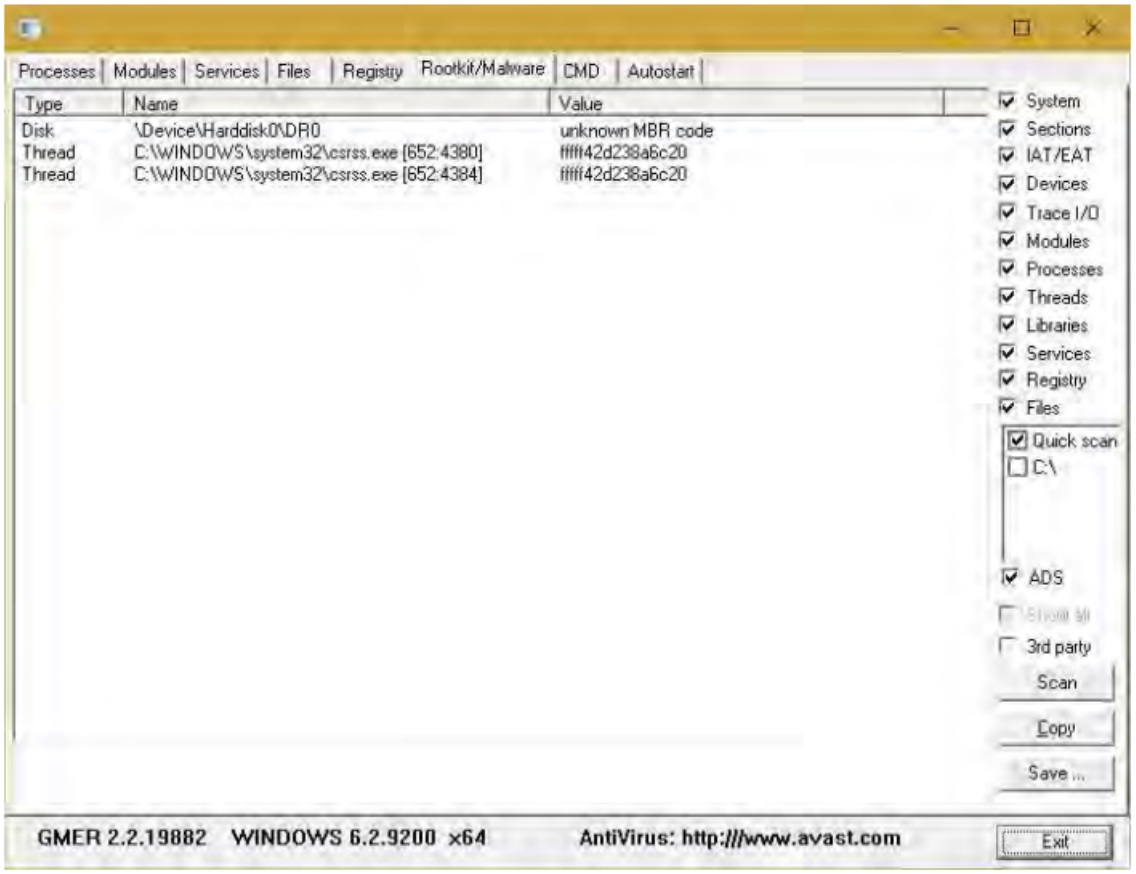
OUTPUT:

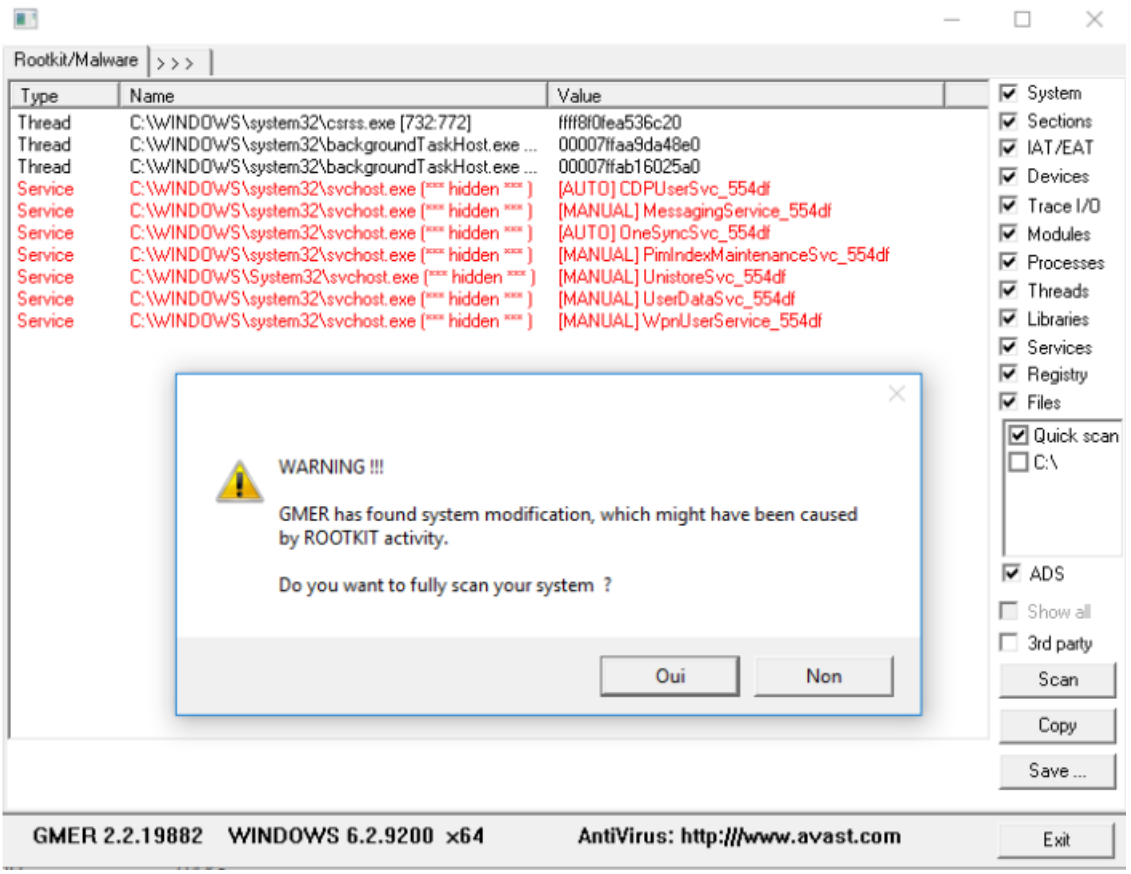
(MS-Paint, Notepad, Command Prompt, Explorer will open infinitely)

11(b) Defeating Malware - Rootkit hunter

Abdul Rahman S - 7881






Rootkit/Malware
> > >
Type
Name
Value
Thread C:\WINDOWS\system32\csrss.exe [732:772] ffff8f0fea536c20
Thread C:\WINDOWS\system32\backgroundTaskHost.exe ... 00007ffaa9da48e0
Thread C:\WINDOWS\system32\backgroundTaskHost.exe ... 00007ffab16025a0
Service C:\WINDOWS\system32\svchost.exe (*** hidden ***) [AUTO] CDPUserSvc_554df
Service C:\WINDOWS\system32\svchost.exe (*** hidden ***) [MANUAL] MessagingService_554df
Service C:\WINDOWS\system32\svchost.exe (*** hidden ***) [AUTO] OneSyncSvc_554df
Service C:\WINDOWS\system32\svchost.exe (*** hidden ***) [MANUAL] PimIndexMaintenanceSvc_554df
Service C:\WINDOWS\System32\svchost.exe (*** hidden ***) [MANUAL] UnistoreSvc_554df
Service C:\WINDOWS\system32\svchost.exe (*** hidden ***) [MANUAL] UserDataSvc_554df
Service C:\WINDOWS\system32\svchost.exe (*** hidden ***) [MANUAL] WpnUserService_554df
WARNING !!!
GMER has found system modification, which might have been caused by ROOTKIT activity.
Do you want to fully scan your system ?
Oui
Non
System
Sections
IAT/EAT
Devices
Trace I/O
Modules
Processes
Threads
Libraries
Services
Registry
Files
Quick scan
C:\
ADS
Show all
3rd party
Scan
Copy
Save ...
GMER 2.2.19882 WINDOWS 6.2.9200 x64
AntiVirus: http://www.avast.com
Exit