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SUBJECT: Cryptography and network security

FACULTY: Balasaraswathi V R

SLOT: L49+L50

EXP NO: 8

Secure Socket Layer Programming

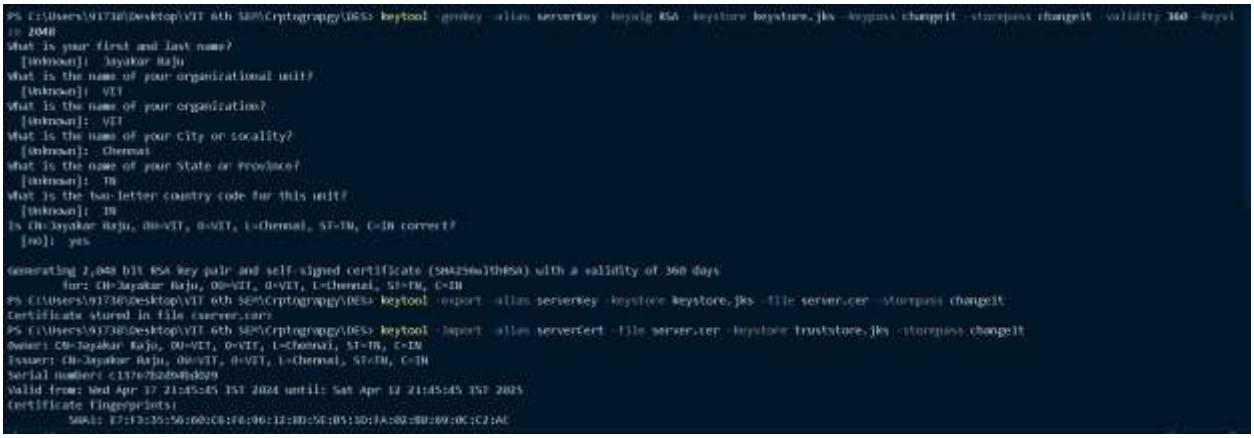
SERVER CODE:

```
import javax.net.ssl.SSLServerSocketFactory;
import javax.net.ssl.SSLServerSocket;
import javax.net.ssl.SSLSocket;
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.PrintWriter;

public class SSL_server {
    public static void main(String[] args) {
        try {
            System.setProperty("javax.net.ssl.keyStore", "keystore.jks");
            System.setProperty("javax.net.ssl.keyStorePassword", "changeit");

            SSLServerSocketFactory ssf = (SSLServerSocketFactory)
SSLServerSocketFactory.getDefault();
            SSLServerSocket serverSocket = (SSLServerSocket)
ssf.createServerSocket(9999);

            System.out.println("SSL ServerSocket started");
            SSLSocket sslSocket = (SSLSocket) serverSocket.accept();
            System.out.println("Server socket accepted");

            PrintWriter out = new PrintWriter(sslSocket.getOutputStream(), true);
            BufferedReader in = new BufferedReader(new
InputStreamReader(sslSocket.getInputStream()));

            String line;
            while ((line = in.readLine()) != null) {
                System.out.println("Received: " + line);
                out.println("Echo: " + line);
            }
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

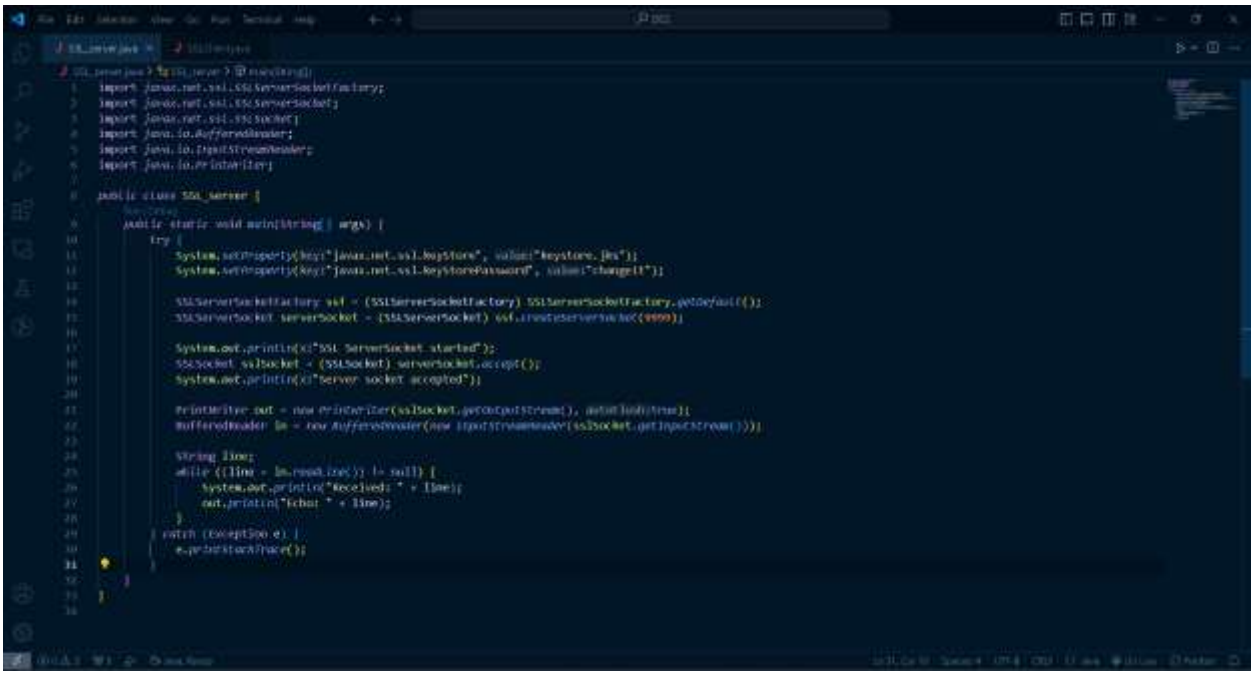
Client Code:

```
import javax.net.ssl.SSLSocketFactory;
import javax.net.ssl.SSLSocket;
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.PrintWriter;

public class SSLClient {
    public static void main(String[] args) {
        try {
            System.setProperty("javax.net.ssl.trustStore", "truststore.jks");
            System.setProperty("javax.net.ssl.trustStorePassword", "changeit");

            SSLSocketFactory ssf = (SSLSocketFactory)
SSLSocketFactory.getDefault();
            SSLSocket sslSocket = (SSLSocket) ssf.createSocket("localhost",
9999);

            PrintWriter out = new PrintWriter(sslSocket.getOutputStream(), true);
            BufferedReader in = new BufferedReader(new
InputStreamReader(sslSocket.getInputStream()));

            out.println("Hello SSL Server");
            String line;
            while ((line = in.readLine()) != null) {
                System.out.println("Received: " + line);
            }
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

OUTPUTS:

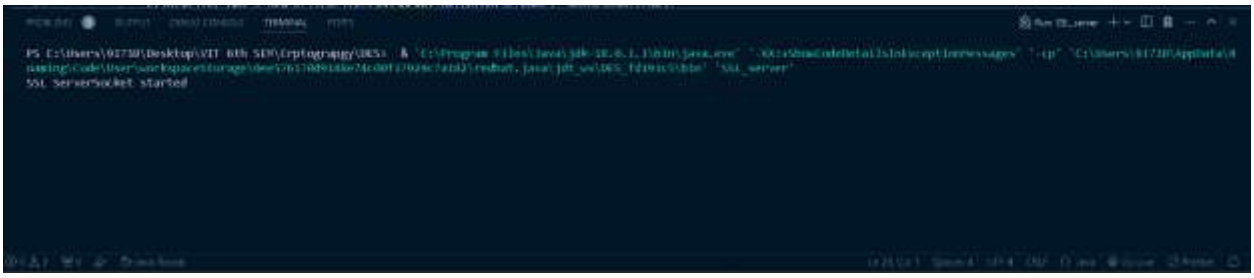


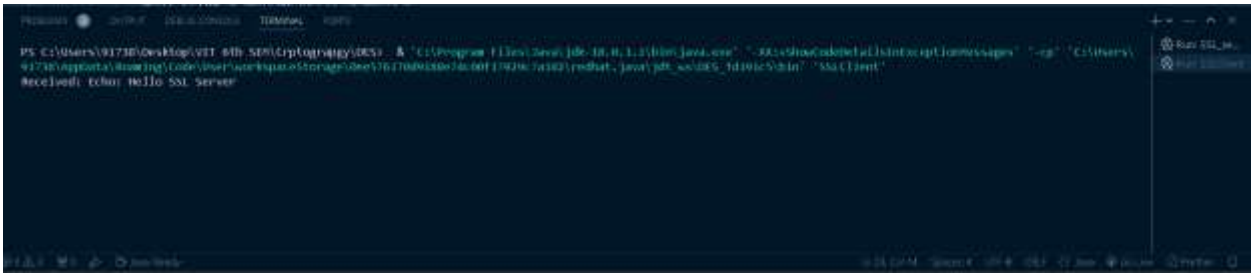

```
Valid from: Wed Apr 17 21:45:45 IST 2024 until: Sat Apr 12 21:45:45 IST 2025
Certificate fingerprints:
         SHA1: E7:F3:35:56:60:C6:F6:96:12:8D:5E:B5:1D:FA:02:B8:69:0C:C2:AC
         SHA256: 12:9A:F4:85:26:2C:CC:AA:76:0C:9D:53:53:92:94:9A:56:33:F9:94:31:5C:95:C8:FF:31:58:62:0B:1D:96:B7
Signature algorithm name: SHA256withRSA
Subject Public Key Algorithm: 2048-bit RSA key

Extensions:

#1: ObjectId: 2.5.29.14 Criticality=false
SubjectKeyIdentifier [
KeyIdentifier [
0000: DD BE 06 F1 66 1E 45 67   9D B4 68 1C 16 2B 2B 4B  ....f.Eg..h..++K
0010: 9E 40 C0 B2                                        .@..
]
]

Trust this certificate? [no]:  yes
Certificate was added to keystore
PS C:\Users\91738\Desktop\VIT 6th SEM\Crptograpgy\DES>
```

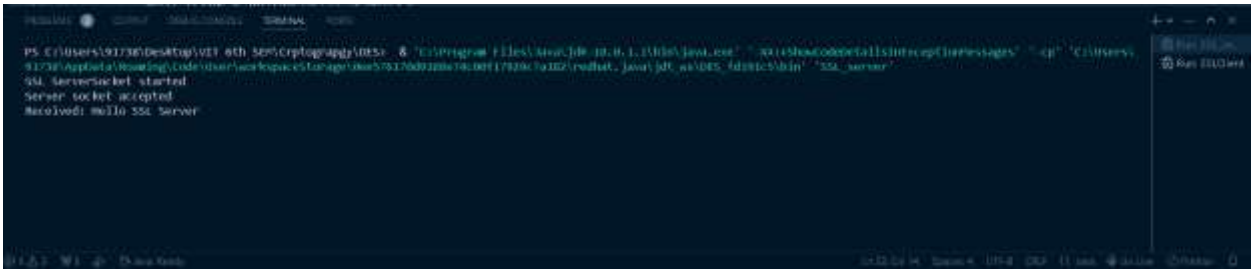


```java
import javax.net.ssl.SSLServerSocketFactory;
import javax.net.ssl.SSLServerSocket;
import javax.net.ssl.SSLSocket;
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.PrintWriter;

public class SSL_Server {
    public static void main(String[] args) {
        try {
            System.setProperty("javax.net.ssl.keyStore", "keystore.jks");
            System.setProperty("javax.net.ssl.keyStorePassword", "changeit");

            SSLServerSocketFactory ssf = (SSLServerSocketFactory) SSLServerSocketFactory.getDefault();
            SSLServerSocket serverSocket = (SSLServerSocket) ssf.createServerSocket(9999);

            System.out.println("SSL ServerSocket started");
            SSLSocket sslSocket = (SSLSocket) serverSocket.accept();
            System.out.println("Server socket accepted");

            PrintWriter out = new PrintWriter(sslSocket.getOutputStream(), true);
            BufferedReader in = new BufferedReader(new InputStreamReader(sslSocket.getInputStream()));

            String line;
            while ((line = in.readLine()) != null) {
                System.out.println("Received: " + line);
                out.println("Echo " + line);
            }
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

```java
import javax.net.ssl.SSLSocketFactory;
import javax.net.ssl.SSLSocket;
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.PrintWriter;

public class SSLClient {
    public static void main(String[] args) {
        try {
            System.setProperty("javax.net.ssl.trustStore", "truststore.jks");
            System.setProperty("javax.net.ssl.trustStorePassword", "changeit");

            SSLSocketFactory ssf = (SSLSocketFactory) SSLSocketFactory.getDefault();
            SSLSocket sslSocket = (SSLSocket) ssf.createSocket("localhost", 9999);

            PrintWriter out = new PrintWriter(sslSocket.getOutputStream(), true);
            BufferedReader in = new BufferedReader(new InputStreamReader(sslSocket.getInputStream()));

            out.println("Hello SSL Server");
            String line;
            while ((line = in.readLine()) != null) {
                System.out.println("Received: " + line);
            }
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```


PS C:\Users\91738\Desktop\VIT 6th SEM\Cryptography\DES> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\91738\AppData\Roaming\Code\User\workspaceStorage\dee57617dd9188e74c00f1792dc7a102\redhat.java\jdt_ws\DES_fd191c5\bin' 'SSL_server'
SSL ServerSocket started


PS C:\Users\91738\Desktop\VIT 6th SEM\Cryptography\DES> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\91738\AppData\Roaming\Code\User\workspaceStorage\dee57617dd9188e74c00f1792dc7a102\redhat.java\jdt_ws\DES_fd191c5\bin' 'SSLClient'
Received: Echo: Hello SSL Server


PS C:\Users\91738\Desktop\VIT 6th SEM\Cryptography\DES> & 'C:\Program Files\Java\jdk-18.0.1.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\91738\AppData\Roaming\Code\User\workspaceStorage\dee57617dd9188e74c00f1792dc7a102\redhat.java\jdt_ws\DES_fd191c5\bin' 'SSL_server'
SSL ServerSocket started
Server socket accepted
Received: Hello SSL Server