Template Week 6 – Networking

Student number:566040

Assignment 6.1: Working from home

Screenshot installation openssh-server:

Screenshot successful SSH command execution:

Screenshot successful execution SCP command:

Screenshot remmina:

Assignment 6.2: IP addresses websites

Relevant screenshots nslookup command:

Screenshot website visit via IP address:

Assignment 6.3: subnetting

How many IP addresses are in this network configuration 192.168.110.128/25?

What is the usable IP range to hand out to the connected computers?

Check your two previous answers with this calculator:
https://www.calculator.net/ip-subnet-calculator.html

Explain the above calculation in your own words.

Assignment 6.4: HTML

Screenshot IP address Ubuntu VM:

Screenshot of Site directory contents:

Screenshot python3 webserver command:

Screenshot web browser visits your site

Bonus point assignment – week 6

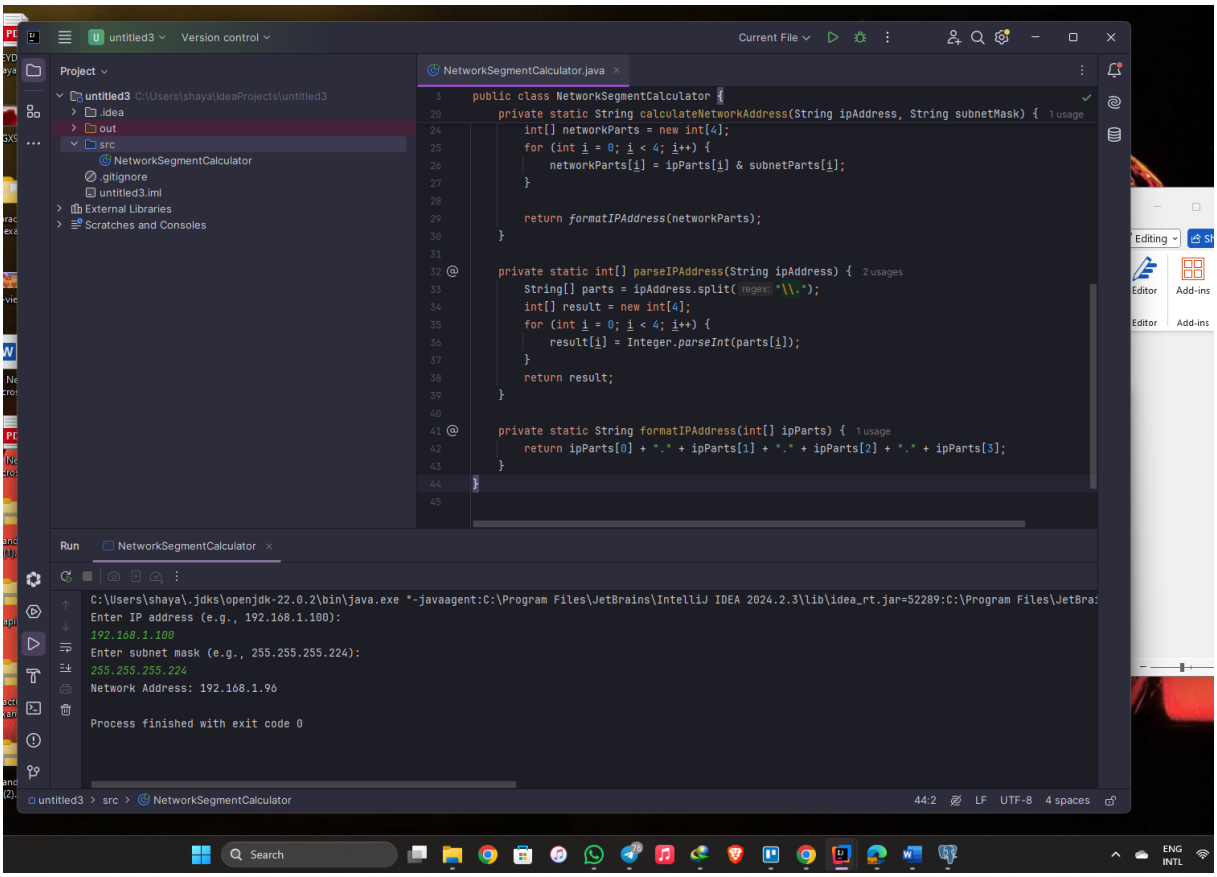
Remember that bitwise java application you've made in week 2? Expand that application so that you can also calculate a network segment as explained in the PowerPoint slides of week 6. Use the bitwise & AND operator. You need to be able to input two Strings. An IP address and a subnet.

IP: 192.168.1.100 and subnet: 255.255.255.224 for /27

```
Example: 192.168.1.100/27
Calculate the network segment
IP Address:   11000000.10101000.00000001.01100100
Subnet Mask:  11111111.11111111.11111111.11100000
-----------------------------------------------
Network Addr: 11000000.10101000.00000001.01100000

This gives 192.168.1.96 in decimal as the network address.
For a /27 subnet, each segment (or subnet) has 32 IP addresses (2⁵).
The range of this network segment is from 192.168.1.96 to 192.168.1.127.
```

Paste source code here, with a screenshot of a working application.




```
import java.util.Scanner;

public class NetworkSegmentCalculator {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter IP address (e.g., 192.168.1.100):");
        String ipAddress = scanner.nextLine().trim();  // Trim whitespace

        System.out.println("Enter subnet mask (e.g., 255.255.255.224):");
        String subnetMask = scanner.nextLine().trim();  // Trim whitespace

        String networkAddress = calculateNetworkAddress(ipAddress, subnetMask);
        System.out.println("Network Address: " + networkAddress);
```

```
        scanner.close();
    }

    private static String calculateNetworkAddress(String ipAddress, String subnetMask) {
        int[] ipParts = parseIPAddress(ipAddress);
        int[] subnetParts = parseIPAddress(subnetMask);

        int[] networkParts = new int[4];
        for (int i = 0; i < 4; i++) {
            networkParts[i] = ipParts[i] & subnetParts[i];
        }

        return formatIPAddress(networkParts);
    }

    private static int[] parseIPAddress(String ipAddress) {
        String[] parts = ipAddress.split("\\.");
        int[] result = new int[4];
        for (int i = 0; i < 4; i++) {
            result[i] = Integer.parseInt(parts[i]);
        }
        return result;
    }

    private static String formatIPAddress(int[] ipParts) {
        return ipParts[0] + "." + ipParts[1] + "." + ipParts[2] + "." + ipParts[3];
    }
}
```

Ready? Save this file and export it as a pdf file with the name: **week6.pdf**