

|  |  |  |  |
| --- | --- | --- | --- |
| Academic Year | 2022 | | |
| Semester | Fall | Winter | Summer |
| Course Code - Name | DCF255 – Data Communication Fundamentals | | |
| Instructor | Jithin Sebastian | | |
| Assessment | Assignment 1 |  | |
| Due Date | Sunday, February 20, 2022 | | |

**Student ID 147268205**

**Student Name Jay Pravinkumar Chaudhari**

**Question 1**

This Assignment is an individual task and worth 5% of the total assignment grade (15%). Answer the following questions and support your answer with diagrams as per your answer and submit it on the link provided on MySeneca under DCF255.

**Question 1**

Many companies today sell services or products. In addition, there are many companies running E-business solutions and various kinds of webserver/database technologies that allow them to conduct business over the internet as well as over other  
networks. Such applications usually represent a client/server scenario in which one or more servers serve multiple clients. What is client/server communication and explain sockets and how sockets are used in client-server communication with a diagram. [7.5Marks]

**Solution**

**The client server communication works on simple terms that is the client captures user input and forwards it to the server for processing as a request and in the server side it is created in a way that it can interact with the user in their own different language then, the server side processes the data given by the user and responds it back to the client. All the client-server model operates on a single layer which is known as application layer. The application layer creates the message and then delivers the message. For the client server communication to happen TCP/IP protocol is used when the client tries to connect to the server it will first go through the TCP/IP architecture. The TCP/IP maintains the connection until the client and server have completed their message exchange. The top layer of TCP/IP protocol stack is called the application layer. The application layer defines the protocol to exchange the data and specifies how applications can access the services of the other layers using the sockets. A socket is an Ip addresses and a port number, separated by a colon. The socket is used by the local process to make connections to destinations hosts and exchange data. There are a total of 65,535 ports on a PC. Ports from 1 – 1023 are known as well-known ports and are controlled by the Internet Corporation for Assigned Names and Numbers(ICAAN). The widely used application layer is used to exchange information in the protocol. When the client connects to it specific socket the server waits and listens to the client from the socket for the client to make a connection request. So, this is how client server communicates and with the help of socket, application layer can assign the port number through which they can communicate.**

**DIAGRAM OF CLIENT-SERVER COMMUNCATION USING THE SOCKETS:**

**Diagram

Description automatically generated**

**Question 2**

John Gage has described the IT environment of today as “The network is the computer”. Explain how Cloud Computing is useful for software engineering. [7.5 Marks]

**Solution**

**Nowadays, almost all companies have switched to cloud computing, or they are making their step towards cloud computing. The reason why companies are preferring cloud over their local servers is because it has given the flexibility of using the services without affecting their business and their innovation. Also, the because of the pandemic it played a huge for the companies to forcibly switch their business to cloud because everyone was preferring work from home instead going to the company and it helped companies a lot in increasing their employee’s productivity and flexibility. Form the programmer’s perspective, cloud computing has become their new development platform for the software engineers there are many reasons why programmers prefer cloud computing. Firstly, it provides the flexibility to use the system which they want by signing up for the services they need, and companies also provides the pay as use service, so cloud computing helps them to try out new things they don’t have to worry about purchasing new equipment to try new things. Secondly, it is very easy for engineers to send large files with their clients or with their colleagues and cloud can do that within few minutes as a result many people can work separately on the same project in their own separate platform and developer tools so this will decrease the changes of creating any errors on the server because it will not save directly into the server and it will also allow employees to first test it on cloud instead of directly connecting and testing on main server. Lastly, security which is one of the biggest problems many companies face because when the companies are using their local servers there are very high chances that there might be some attack could be done by the hackers which will stole their clients and company’s personal information. As a result, in this case cloud providers have already deployed their high-end security on their server side so even if someone try to hack the system there are very high chances that cloud providers security system will detect the attempt of security breach and it will block the hackers from stealing the data. Hence, these are all the reasons which shows that how with the help of cloud computing software engineers can do their work easily and efficiently.**

**Question 3**

Assume that you are accessing a Microsoft website from your home computer (desktop/laptop/tablet).

1. Identify and discuss the method used at your home to access the Internet and then connection with the Microsoft web server. [5 Marks]
2. Sketch/draw a network connection from your device to the Microsoft web server. [5 Marks]

**Solution**

1. **If I want to access the Microsoft website from my home computer using the internet connection then, first I have to make sure that my computer/desktop/laptop must be connected to the internet using the router connection. After that, with the help of my device’s IP address is connected to my internet service provider and because of that they provide me secure and stable internet connection. Then, I open the web browser to connect, and I type the Microsoft web address in the address bar of the web browser and then the browser searches into the DNS to retrieve the corresponding IP addresses for the Microsoft web server. When the IP address of the website is found then it initiates the TCP/IP connection to the server which is a 5-layer protocol where the client side sends the message to the server to establish a connection. Then, once the message reaches the browser it will send the HTTP GET request asking for the Microsoft website. The web server receives the request and checks for the page and then reverts it back if the request response is found. If the browser is unable to find what is requested by the client, then it will send the 404-error message. The response valid request response from the Microsoft server this response contains the information every information that the client requested like Microsoft web page, image, or videos it contains etc. After that, the browser loads the contents of the Microsoft website. So, this is how from my home network I can connect to the Microsoft website.**
2. **DIAGRAM OF NETWORK CONNECTION:**

**Diagram

Description automatically generated**