**Computer Networks**

**Spring 2023**

Research Assignment BSE-6A,6B

**Due Date: Sunday 16th April 2023**

**Evaluation**: **On 17 April and 18 April There Will be a Viva. (Tentative)**

1. **No Plagiarism will be tolerated in any Case. If you have any ambiguity in this Statement, then do plagiarize and face a severe Penalty (Getting all Quiz and Assignment to 0) or DC or Both.**
2. You Need to Rename the Screenshot to RollNumber\_Q#\_S# where # represents Question or Screenshot Number.
3. Everything Should be Formatted inside a Document.
4. Only a PDF File will be Submitted.
5. This Assignment Evaluation will be Based on Viva and Your Work.
6. After Evaluation you can delete your OPEN AI API KEY.
7. The Purpose of Assignment is to Teach you the Importance of Computer

Network in the Life of a Computer Scientist.

**Q1)**

**Task Title: Interacting with Open AI GPT-3.5 Turbo API using Postman or Thunder Client**

Overview: In this assignment, you will learn about interacting with Open AI GPT-3.5 Turbo API using HTTP methods and requests. You will be required to use Postman or Thunder Client to send GET and POST requests to Open AI API, retrieve data, and submit screenshots of the requests and responses.

Tasks:

* Familiarize yourself with the Open AI API documentation for GPT-3.5 Turbo model: [https://beta.Open AI.com/docs/api-reference/gpt-3](https://beta.openai.com/docs/api-reference/gpt-3)
* Sign up for an Open AI API account and obtain an API key.
* Install and configure Postman or Thunder Client on your computer.
* Create a GET request to retrieve information about the GPT-3.5 Turbo model using the following endpoint: https://api.Open AI.com/v1/completions.
* Analyze the response received from the GET request and identify the different parts of an HTTP response.
* "Content-Type: application/json" header needs to be Configured in the Post Request
* Create a POST request to submit any query to the GPT-3.5 Turbo model by seeing the documentation of Chat gpt.
* Configure the POST request headers to include your API key.
* Configure the POST request body to include the prompt and parameters for the GPT-3.5 Turbo model.
* Analyze the response received from the POST request and identify the different parts of an HTTP response.
* Submit screenshots of the GET and POST requests, including the request URL, headers, and body, along with the HTTP response.

Submission Requirements:

* Screenshots of the GET and POST requests, including the request URL, headers, and body, along with the HTTP response.
* A brief report summarizing the purpose and benefits of using Open AI API.

Evaluation Criteria: Your assignment will be evaluated based on the following criteria:

* Accuracy and completeness of the HTTP requests and responses.
* Quality of the screenshots.
* Understanding and explanation of the purpose and benefits of using Open AI API.

Note: Ensure that you follow proper standards and include comments where necessary.

**Q2)** **Assignment Title: Analyzing TCP and UDP segments using Wireshark for Open AI API**

Overview: In this assignment, you will learn about analyzing TCP and UDP segments using Wireshark for Open AI API. You will be required to use Wireshark to capture network traffic for Open AI API requests and analyze the TCP and UDP segments.

Tasks:

* Install and configure Wireshark on your computer.
* Start capturing network traffic on the appropriate network interface.
* Use Postman or Thunder Client to send GET and POST requests to the Open AI API, using the steps outlined in the previous assignment.
* Stop capturing network traffic in Wireshark.
* Analyze the captured network traffic and identify the TCP and UDP segments for the Open AI API requests.
* Identify the source and destination IP addresses and ports for each segment.
* Analyze the TCP and UDP headers to understand their structure and content.
* Identify any issues or anomalies in the network traffic.

Submission Requirements:

* A brief report summarizing the purpose and benefits of using Wireshark to analyze network traffic.
* Screenshots of the Wireshark capture, showing the TCP and UDP segments for the Open AI API requests, along with any relevant analysis.

Evaluation Criteria: Your assignment will be evaluated based on the following criteria:

* Accuracy and completeness of the network traffic capture.
* Quality and relevance of the analysis performed.
* Understanding and explanation of the purpose and benefits of using Wireshark for network traffic analysis.

Note: Ensure that you follow proper ethical. Good luck!

**Q3)** Assignment Title: Research on Configuring SSL in Websites

Overview: In this assignment, you will be required to research and understand the process of configuring SSL in a website. SSL (Secure Socket Layer) is a security protocol that is used to establish a secure and encrypted connection between the website and the user's browser. SSL is essential for ensuring that the data transferred between the website and the user is secure and private.

Tasks:

* Research and understand the concept of SSL and its importance in website security.
* Identify the different types of SSL certificates that are available.
* Understand the process of generating a Certificate Signing Request (CSR).
* Research and identify the different SSL certificate providers and their pricing plans.
* Understand the process of installing and configuring SSL in different types of web servers, such as Apache, Nginx, and IIS.
* Research and understand the process of renewing SSL certificates.
* Understand the common SSL issues that can occur and how to troubleshoot them.

Submission Requirements:

* A report summarizing your research findings on configuring SSL in websites.
* An annotated list of resources used for your research, such as articles, videos, and tutorials.

Evaluation Criteria: Your assignment will be evaluated based on the following criteria:

* Accuracy and completeness of your research findings.
* Quality and relevance of the resources used for your research.
* Clarity and coherence of your report.

**Q4)** Answer the Following Question

1. What is the Effect of HTTP and HTTPS (Version 1.0 and 1.1) being the Stateless Protocol on the Login System of any Website?
2. How Login from Different Devices to Same Websites are Handled? Does Login from one Device Means All the Devices are logged in if some Kind of Static Variable is Used for Login?
3. Can you identify the differences between IPv4 and IPv6, and explain how to configure and troubleshoot each protocol?

**Q5)** BONUS QUESTION

1. What is an API, why it is Necessary in Today’s World and Design Get and Post Request for the API in Any Language of your Choice? (I Prefer Node.js (Can be learned and done in 2 Hours Easily) with Express). Just 2 Request needs to be Handled GET and POST
2. Go to <https://www.ssllabs.com/ssltest/> and Perform a SSL Test on <https://flexstudent.nu.edu.pk/> . Understand why SSL is Necessary for a Website.

So, Complete Research on Every Field. What is the Overall Rating? Research About Every Field available in Certificate # 1 and Configuration such as which Protocols are Supported and What does that Protocol Means, what is the **Signature algorithm and What Does That Means** etc. Submit the Complete Research.

1. You must do the Login via GET or Post Command into a website.

(I Will Give the Website on The Runtime for Evaluation Purpose. I will Provide the Link for the Practice Website on 16 April 2023)