

# UEEN3123/UEEN3433 TCP/IP Network Application Development

## ASSIGNMENT

May 2018 Trimester

### Course Outcomes

In this assessment, you are assessed based on the following **course outcomes**:

- **CO2:** Build client-server network applications using TCP and UDP transport-layer protocols.
- **CO3:** Develop multicast and broadcast network applications.
- **CO4:** Utilize a scripting language to automate networking tasks.

### Assessment Contribution

This assignment contributes **15%** to the overall assessment for this course with equal contribution for each CO.

### Membership

This assignment must be attempted in a **individually**.

### Deadline

The deadline for this assignment is **Monday, August 20, 2018**.

## Part A

The public transportation authorities would like to develop a mobile app to provide information about transit rail systems to the public. You are required to develop a **Web API** using **Flask** for the staff to maintain information about **transit stations** of the MRT Sungai Buloh - Kajang line. The data of the transit stations will be stored in an SQLite database where your Web API connects to the SQLite database to perform the necessary database queries and updates.

The Web API provides the following endpoints where the mobile app connects to to perform HTTP requests and receives the appropriate HTTP responses in JSON format.

1. GET /api/stations
2. GET /api/stations/<int:id>
3. POST /api/stations
4. PUT /api/stations/<int:id>
5. DELETE /api/stations/<int:id>

The SQLite database that will be used by the Web API consists of one table named **stations** as shown in the sample partial data shown in Table 1.1:

id	code	name	type
17	SBK07	Surian	Elevated
18	SBK08	Mutiara Damansara	Elevated
19	SBK09	Bandar Utama	Elevated
20	SBK10	TTDI	Elevated
25	SBK12	Phileo Damansara	Elevated
26	SBK13	Pusat Bandar Damansara	Elevated
27	SBK14	Semantan	Elevated
29	SBK15	Muzium Negara	Underground
30	SBK16	Pasar Seni	Underground
31	SBK17	Merdeka	Underground
33	SBK18A	Bukit Bintang	Underground

Table 1.1: Sample partial data of *stations* table

## Part B

Develop a broadcast application to disseminate earthquake and tsunami warning information to all clients on the subnet as follows:

1. **Broadcast Sender:** Prompts the user to enter the information listed below and send the information together with the server date & time in JSON format to all broadcast receivers on the subnet:
  - a) Date & Time of Occurrence
  - b) Type (Earthquake / Tsunami Warning)
  - c) Location
  - d) Description
2. **Broadcast Receiver:** Continuously receive the broadcast from the abovementioned broadcast sender and displays the information accordingly.

## Part C

Develop the following Python scripts that connect to the Web API in **Part A** to perform the following operations:

1. Reads data about transit stations from a CSV file and store them on the server via the Web API.
2. Downloads data about all transit stations from the server via the Web API and saves them in a CSV file.
3. A few transit stations are recently involved in the *Station Naming Rights Programme*, hence the name of these stations will need to be updated to reflect the naming rights, for example, Bukit Bintang will be renamed as Pavilion Bukit Bintang. A script is required to read the updates from a CSV file and perform the updates to the data on the server via the Web API.

## Deliverables

You should submit the following items in your report:

1. Hardcopy printouts of all Python scripts, arranged accordingly by parts.
2. Hardcopy printouts of **sample screen output**.
3. Softcopy of all Python scripts, each part should be grouped within the same project.
4. Softcopy of all SQLite and CSV files used, appropriately placed within the same project for which they belong to.

## Submission & Originality Policies

1. This assignment must be submitted completely by the abovementioned deadline.
2. All work must be original and if, taken from any works other than yours must be properly referenced.
3. Any plagiarized content will be penalized, including the award of zero marks.

## Marks Allocation

Part / No.	Course Outcome	Assessment Criteria	Marks
A / 1	CO2	Data Access & Storage	5
A / 2	CO2	Functionalities	20
A / 3	CO2	Data Exchange	8
B / 1	CO3	Sockets Usage	10
B / 2	CO3	Program Logic	15
B / 3	CO3	Data Exchange	8
C / 1	CO4	Use of HTTP Client module	10
C / 2	CO4	Script Logic	15
C / 2	CO4	Data Exchange	8
		<b>TOTAL</b>	<b>99</b>