SOFT8023 – Assignment 2

Due: 21st Dec 2023
Value: 30%

Important Instructions:

It is ***mandatory*** to attach a word file which should include snapshot of the code, explanation of the complete code, attach output snapshot as well. Also, include screen recording for each part of the solution (code and output) in your submission.

The zip file should consist of three things; 1. Word file including snapshots with explanation of each step in the code, code for each file, and screen recording.

Part 1 (15%)

Overview

Using Python Sockets, create an application that allows a remote client to send commands to a server component to get employee details.

Client:

Develop a menu-driven console-based program (using Sockets) that will allow the user to get (a) either current salary or total salary for a given year, or (b) the vacation days taken in a given year or the current annual leave entitlement.

Example run:

HR System 1.0
What is the employee id? **E00123**
Salary (S) or Annual Leave (L) Query? **S**
Current salary (C) or total salary (T) for year? **C**
Employee Aadya Khan:
Current basic salary: 38566
Would you like to continue (C) or exit (X)? **C**
What is the employee id? **W01033**
Sorry... I don't recognise that employee id
What is the employee id? **E01033**
Salary (S) or Annual Leave (L) Query? **S**
Current salary (C) or total salary (T) for year? **T**
What year? **2018**
Employee John Smith:

Total Salary for 2018: Basic pay, 29400; Overtime, 2587
Would you like to continue (C) or exit (X)? **C**
What is the employee id? **E00123**
Salary (S) or Annual Leave (L) Query? **L**
Current Entitlement (C) or Leave taken for year (Y)? **Y**
What year? **2016**
Employee Aadya Khan:
Leave taken in 2016: 22 days
Would you like to continue (C) or exit (X)? **C**
What is the employee id? **E01033**
Salary (S) or Annual Leave (L) Query? **L**
Current Entitlement (C) or Leave taken for year (Y)? **C**
Employee John Smith:
Current annual leave entitlement: 25 days
Would you like to continue (C) or exit (X)? **X**
Goodbye

Server:

Using Socket programming, accept a connection from a client and handle the options given in the example run, i.e.

- Verify the existence of an employee id. The client sends a value such as "E00123" and we return a Boolean result.
- Knowing the employee id is valid, now can receive commands and options.
- The server must also be able to send back a "not recognised" response for invalid commands /options (and the client must handle it).
- Use 1 or more data structures (hard coded is fine) to store some employee details. Lists, dictionaries or whatever you want can be used. You could use tinydb for a JSON file, but it is not necessary.

Part 2 (6%)

Modify the sockets server program to handle multiple simultaneous client connections.

Part 3 (6%)

With such sensitive information, it would be good to keep track of access to the system (i.e . an activity log). Modify the server so that each time a request is received for a employee, a message is sent to a message queue with the employee id, the command and options sent from the client, as well as IP address details. Then write a simple script to print out the activity log details. Use RabbitMQ.

Part 4 (3%)
Put the server into a Docker container.