NANYANG TECHNOLOGICAL UNIVERSITY

Written Test (Part 2) 2020-2021

CI6206 – INTERNET PROGRAMMING

Nov 2020

INSTRUCTIONS

1. This paper contains **TWO (2)** questions and comprises **FOUR (4)** pages.

2. Answer all **TWO (2)** questions. (50 marks)

3. This is an open book test and is to be completed strictly by yourself and no discussion is allowed.

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1.   (a)   AJAX – Asynchronous Javascript and XML is set of Web development techniques using many Web technologies on the client side to create asynchronous Web. Illustrate with the help of a process-flow diagram the communication that takes place between a client and server. List the steps involved in the process.

(4 marks)

      (b)   Figure Q1a shows a Web-based Staff Loan System – Search staff. A JSP page **SearchStaff.jsp** allows the IT helpdesk to search and display the loan information of employees in NTU. After submitting the request, an **AJAX request** is sent to a server-side program that returns a search results in **XML format**. If the return results are empty, a message "No data" is displayed instead of the table.

Figure Q1b. Search Staff (SearchStaff.jsp)

Write an AJAX application (client-side and server-side) that supports the functionality as described above that meets the following specifications:

- The content of the table shown in figure Q1b is loaded without requiring the screen to perform any refresh.
- Assume that the server-side program exists and its absolute path is **/SearchStaff**
- User enters the search string.
- The server-side application accepts one query string parameter named **searchString** as input field from **SearchStaff.jsp**.
- SeachStaff.jsp will forward the request to a Servlet **RetrieveLoan.java** where it will retrieve the required data from a LoanDBAO class.

    LoanDBAO db = new LoanDBAO();
    List staff = db.getLoanByStaffName(searchString);

Question 1 continues on Page 2

- Perform session tracking whenever necessary.
- The server-side application will return data in XML format. Propose and design your own XML format.
- Provide sufficient comments in your code.
- A graphical user interface is shown in Figure Q1b.
- State any assumptions clearly.

You are to use the code listed in Appendix Q1. Comments are provided as a usage guide. Do not reproduce the code in your answers unless there are modifications. State any assumptions made.

(24 marks)

(c)   The AJAX application in Q1b is subject to SQL injection attack. Explain how SQL injection attack works and explain which components of "CIA" (Confidentiality, Integrity and Availability) are being violated? Provide reasons to support your answer.

(6 marks)

2.   (a)   Figure Q2a shows a HTML page implemented using jQuery accordion UI. Each of the section should display another set of jQuery accordion with the following text when selected:

- STAFF section displays a set of jQuery accordion as shown in Figure Q2a-1.
  - Permanent → Benefits : 14-days annual leave
  - Adjunct → No annual leave entitlement
- PARKING section displays a set of jQuery accordion as shown in Figure Q2a-2
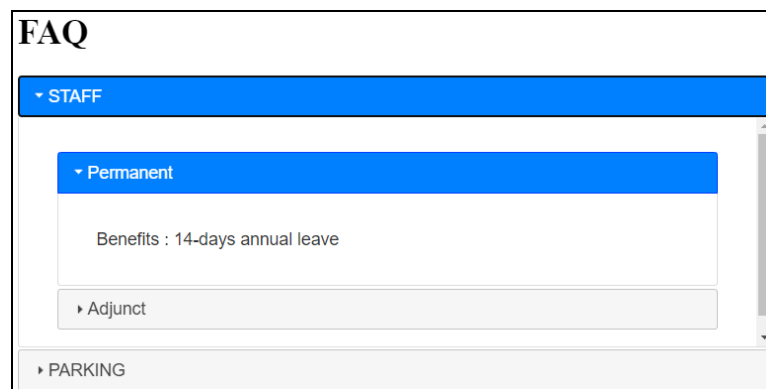 - Carpark J → $80 per month
  - Carpark H (Sheltered) → $100 per month

Figure Q2a-1

Question 1 continues on Page 3

Figure Q2a-2

(8 marks)

(b) Figure Q2b shows a HTML page implemented using jQuery. The web page will display the total amount payable based on the selection of the add-on. Figure Q2b-1 shows the initial amount when none of the add-on was selected. Figure Q2b-2 shows the total amount of 3 add-on selected. The total amount will be deducted if any of the add-on is change from selected (checked) to unselected (unchecked).

Figure Q2b-1

Figure Q2b-2

Write jQuery code that supports the functionality described. Part of the code is provided in Appendix Q2b.

(8 marks)

END OF PAPER