

Course Work

ITS1119 – Internet Technologies -1

BSc (Hons.) in Computer Science via GDSE



Take-home assignment and VIVA

Total Marks: 120

Objectives

- Understand the principles of creating effective web pages, including an in-depth consideration of information architecture.
- Become familiar with web design principles and learn how to implement theories into practice.
- Develop skills in analyzing the usability of a website.
- Learn the language of the web: HTML and CSS.
- Learn new layouts like CSS grid layout and flexbox.
- Learn techniques related to responsive web design, including media queries.
- Develop basic programming skills using JavaScript and jQuery.
- Validate a web page using JavaScript
- Developing web application functions using JavaScript.

Coursework Requirements and Instructions

- You have to focus on how to implement this system using your knowledge in Web application development.
- You are required to implement all the layers given in the application architecture.
- This coursework consists of 2 parts, Part A and Part B.
- Both parts carry marks, and you are required to successfully attempt both parts to face the viva-voce at the end of this coursework. Sample questions are given to you in Part B for you to prepare yourself for the viva.
- Refer to the Coursework Guidelines at the end of each part to understand the specific guidelines to be followed.

Submission

- You should submit the deliverables of the coursework on or before the due date specified.
- Your work is to be made into a .zip file with the file name format “[GDSEBatchNo_ITS1119_YourName]” and should be submitted to the Google classroom on or before the given date.
- EXAMPLE: If your GDSE batch is 53 and your name is Nimal Perera,
 - o The .zip file name: GDSE53_ITS1119_NimalPerera.zip

In-memory POS System

Innovative Solutions Private Limited is a company that provides web-based software solutions for its customers. They received an order from a customer requesting a POS system for a small-scale supermarket. The requirement they offered for the software as follows:

System Requirements

1. Add new items and customers to the POS system.
2. Place an order.
3. Save the order to the system and print an invoice.
4. Manage items and customers (Edit, Remove and, Update).

Business Process

This shop only has one cashier, and he does all the tasks, including keeping records of the customers and items.

When a customer comes, he has to add the grocery items to a pulling cart and bring it to the cashier. Then the cashier takes the items one-by-one and enters them into the POS system to calculate the total price and print the invoice.

The cashier can give out discounts to the customers depending on the total price of groceries they purchase. For example:

Customers get a 10% discount for 2000.00 LKR purchase and a 20% discount for 5000.00 LKR purchase.

Note: When they keep customer details, they especially keep a record of their salary capacity and contact information for advertising purposes.

PART A

However, the client insisted that they wanted a demo of the ongoing application before the development process is finished.

1. Assume yourself as a software engineer at Innovative Solutions Private Limited and develop a demo for the given POS system. You do not have to implement a database for the program. A Single Page Application (SPA), in-memory POS system would suffice. Please follow the guidelines given below when implementing the system.

NOTE: THE DATE OF THE VIVA FOR EVALUATING THE SYSTEM WILL BE INFORMED TO YOU FORMALLY BY THE ACADEMIC SECTION OF IJSE. FURTHERMORE, PLEASE MAKE SURE THAT YOU ARE PROFICIENT IN THE CONTENT GIVEN IN PART-B BEFORE YOU ATTEND THE VIVA.

PART B

You should be knowledgeable in the following areas when attending the VIVA.

Hypertext Markup Language

1. What is HTML?
2. Describe the meaning of the word "Hyper."
3. Give a brief introduction to the history of HTML.
4. What is an IP address?
5. Explain the process in a web server and why do we need it?
6. What is a web browser?
7. How does HTTP work, and what does it do?
8. What are the "element function groups" that we use in HTML?
9. Describe the anatomy of an HTML element.
10. Describe the main strategies that we use for web designing.

Cascading Style Sheets

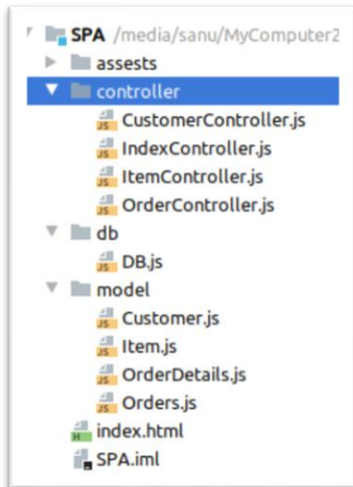
1. What is a CSS rule?
2. What is CSS reset? And why should we use it?
3. What is the meaning of the word Cascade? Describe it.
4. What are the two types of elements in HTML?
5. Describe the types of measurement units in CSS.
6. Describe the difference between absolute and relative positions.
7. What is the default position of an element.?
8. How does the box model help in web designing, and what is the box model?
9. What are the areas of the box model? Explain.
10. How sticky positions work?
11. What is the difference between sticky and fixed positions?
12. When should we use relative positions?
13. What are "em" and "rem"?
14. Explain the difference between Flex and Grid layout?
15. How many selectors are there in CSS? Explain their usage one by one with examples.
16. Explain how the cascades are resolved step by step.
17. What is a transition?
18. What are keyframes in CSS?
19. Explain about media queries and write down a media query to change the styles of a website when it is viewed from a 320px to 375px device.
20. Explain CSS inheritance with an example.
21. Explain how the browser performs the rendering process of a web page.

Java Script

1. What is JavaScript?
2. Explain the history of JavaScript.
3. What is ECMA Script?
4. What is the difference between "var," "let," and "const"?
5. Why is JS known as a dynamic type language?
6. Why is JS a loosely typed language?
7. What are the data types in JS?
8. Explain the prototype base inheritance with examples.
9. What are property descriptors? Explain One by one.
10. What is a DOM? Explain.
11. Drawdown the prototype chain of Function and Object.
12. What is the difference between "for in" and "for of"?
13. What are literals? And what is a literal base object?
14. What is the difference between a literal base object and a Function base object?
15. What is the difference between the prototype and "__proto__." Explain with examples.
16. Explain the two types of properties in JS with examples.
17. Create an encapsulated DTO for the customer.
18. What are the two types of functions in JS? Explain with examples.
19. What is an event object? Explain.
20. Write a code to show the prototype base inheritance using Vehicle and Car objects as you prefer.

Guidelines

1. Use MVC architectural design pattern to structure the project.



2. Save all the data in the memory using arrays.
3. Validate all the fields in every interface of the POS system.
4. Disable tab key default focusing.
5. Implement all the functions and validation for the customer form as shown in the given example video. Click on the image to view the video.

A screenshot of a web application interface titled "Customer Manage". The interface has a blue header bar with the title and a navigation menu with links: Home, Customer, Item, and Orders. The "Customer" link is active. Below the header, there is a section titled "Customer Registraion" (note the typo). This section contains a form with four input fields: "Customer ID", "Customer Name", "Customer Address", and "Customer Salary". Below the form, there are five buttons: "Save Customer", "Remove", "Update", "Get All", and "Clear All". To the right of the form, there is a table with the following data:

Customer ID	Customer Name	Customer Address	Customer Salary
C00-001	Sadun Malaka	No 17, Panadura	100.00
C00-003	Ramal wasuka	Panadura	200.00

6. Implement all the functions and validation for the item form as shown in the given example video. Click on the image to view the video.

The screenshot shows a web application titled 'Item Manage' with a navigation bar containing links for Home, Customer, Item, and Orders. The main content area is divided into two sections. On the left is the 'Item Form' with input fields for 'Item Code', 'Item Name', 'Item Qty', and 'Unit Price'. The 'Item Code' field has a red border and a red error message below it: 'Item Code is a required field - Pattern 100-000'. Below the form are five buttons: 'Add Item' (blue), 'Remove' (red), 'Update' (yellow), 'Get All' (green), and 'Clear All' (red). On the right is a table with four columns: 'Item Code', 'Item Name', 'Item Qty', and 'Item Price'. The table contains three rows of data.

Item Code	Item Name	Item Qty	Item Price
100-001	Lux Bundle	100	48
100-002	Saman	300	150
100-003	Anker	100	340

7. Automatically generate the order ID.
8. Autofill the current date to the order form.
9. Search and add the customer and item details into the order form that you added to the system earlier, as shown in the video below.
10. When adding the items in the customer's cart to the table in the order form,
- Check the available quantity in the store is greater than the amount in the cart.
 - Give the cashier the ability to remove an already added item from the order list.
 - When adding items one by one from the cart, it is normal to get the same amount once or twice. Update the quantity of the items on the table of the order form instead of repeating the same item on the table.
11. Automatically generate the total.
12. Provide an option to add discounts for the customers.
13. Calculate the customer's "balance," which is the grand total after deducting the discount before saving the order.
14. Provide an option to search a previous order from the order ID.

15. Follow the above guidelines related to the order form and implement all of them, including the given functions and validations in the example video. Click on the image to view the video.

The screenshot shows a web application for creating an order. It is divided into three main sections: 'Invoice Details', 'Item Select', and a summary area on the right.

- Invoice Details:** Contains fields for Order ID, Date (with a calendar icon), Customer (a dropdown menu), Customer ID, Name, Salary, and Address.
- Item Select:** Contains fields for Item (a dropdown menu), Item Code, Item Name, Price, QtyOnH, and Order Quantity. There is a red 'Add Item' button at the bottom right of this section.
- Summary:** Displays 'Total : 00.0Rs/=', 'SubTotal : 00.0Rs/=', 'Cash', 'Discount', and 'Balance' fields. There is a green 'Purchase' button at the bottom right.

Below these sections is a table with the following headers: Item Code, Item Name, Price, Quantity, and Total.

16. Please note that all the saved data should be cleared with the browser refresh.

NOTE: YOU DO NOT HAVE TO IMPLEMENT THE USER INTERFACES AS EXACTLY AS IN THE EXAMPLE INTERFACES. YOU ARE FREE TO PRESENT YOUR OWN DESIGNS AS LONG AS YOU DO NOT CHANGE ANY OF THE FUNCTIONS AND THE NECESSARY VALIDATIONS IN THE FORMS.

Research

Please find the bugs in this program and fix them in your projects. Provide your reasoning and your methodologies to your evaluator in the VIVA.

Evaluation Criteria

Method	Marks
Application	60
Research	10
Area of knowledge	50

Pass Marks: 60