**Institute of Vocational Education**

**Department of Information and Communications Technology**

**HDSE (IT114105)**

**ITP4501 Programming Techniques for Mobile Systems**

**Summer Semester 2022-2023**

**Assignment**

**Submission Guidelines**

* This is an individual assignment.
* The submission deadline of the assignment to is **11:55pm, 2 July 2023 (Sunday).**
* You need to submit all program sources (in a single zip file) and your answer of two questions in section 7 (in a MS Word file) to the Moodle website http://moodle.vtc.edu.hk assignment dropbox before the deadline. You are advised to upload your work at a time reasonably earlier than the cut-off date and time. Moodle allows multiple submissions, however, only the latest copy will be retained. You will receive **ZERO MARKS for LATE SUBMISSION**.
* You are also required to give a demonstration. 40 marks will be deducted if demonstration is not done.

1. **Aims and Objectives**

* To gain experience in mobile application UI and program design.
* To gain practical skill of Android application development.
* To understand the constraints and limitation of mobile application and the ways to overcome them.
* To obtain knowledge on connecting the mobile device to the internet services and building a multi-tier distributed system.

1. **Introduction**

In this assignment, you are required to develop an Android Application to play a Match Pairs Memory Game. This app will also record the result and corresponding move counts required to complete a game and use charts to show the history records.

You can use following link to know how to play a Match Pairs Memory Game:

https://www.helpfulgames.com/subjects/brain-training/memory.html

1. **Functional Requirements**

Listed below are the basic requirements of your application. You need to refer to the Local Database section for the database schema.

|  |  |
| --- | --- |
|  | 1. A main activity which contains a main menu for players to choose. The four main functions are: Play, Game Ranking, Your Records and Close. |

1. Game Play

|  |  |
| --- | --- |
| A picture containing table  Description automatically generated | When player touch the "Play" button on the main menu, they start to play the game. The game broad will have 4X2 totally 8 buttons. Each button randomly assign a number from 1 to 4 and two buttons are assigned with same number for matching.  Player starts to find the matching number by touching the buttons. If match pairs are found, the corresponding buttons will be set to invisible. For each trial (touching two buttons), your app require to count the move and show it on the top of screen. |

Calendar

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Calendar

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|  |  |
| --- | --- |
|  | When player find all matching pairs, the final result will show on the top of screen and the button Continue will be set to visible on the bottom. Player can start to play a new game by touch this button.  Note: You are encouraged to design and implement extra features. For example, use image buttons to replace numeric buttons. 20 marks will be allocated on such additional functions. Refer to section 7 Marking Guidelines for more details. |

|  |  |
| --- | --- |
|  | 1. When players touch the "Game Ranking" button on the main menu, your app will download a JSON from a given api server. You MUST use a ListView to show all the records in the JSON string. |
|  |  |

|  |  |
| --- | --- |
|  | 1. When players touch the "Your Records" button on the main menu. Your app will load the records in the GamesLog table from your local database. You MUST use a ListView to show all these records. |

1. **Local Database**

The database scheme described here is an extremely simple one. Many fields are intended not to be included in order to reduce the complexity of this assignment. You are free to add columns and tables to the database to fit for your own needs.

**GamesLog** (**gameID**, playDate, playTime, moves)

1. **Ranking JSON Server**

You can obtain a ranking list from following api server and the data returned is in JSON format:

https://ranking-mobileasignment-wlicpnigvf.cn-hongkong.fcapp.run

The JSON string returned is shown below:

[{"Name":"Peter Kwong","Moves":8},

{"Name":"John Chan","Moves":9},

{"Name":"Mary Lam","Moves":6},

{"Name":"David Wong","Moves":12},

{"Name":"Alan Po","Moves":5}]

You need to sort the JSON data by using "Moves" in ascending order to obtain the ranking.

1. **Additional Constraints**

* The UI of the mobile application must be produced with Android widgets such as **TextView**, **CheckBox**, and **Spinner** etc. Web-based UI is **NOT** allowed.

1. **Marking Guidelines**

You project will be assessed according to the items below.

* Database initialisation.
* Level of completion.
* Correctness.
* UI design (no mark will be given if you are using the same design in this document).
* Program design and implementation.
* Program style and comments.
* Driving Question: How can a company get benefit from a purchase order management system by using a mobile app?

In today's business environment, businesses can benefit greatly from implementing an order management system using mobile apps. This combination offers many benefits that can make your procurement process more efficient and effective.  
  
One of the main benefits is increased efficiency. Employees can easily access and manage orders on the go, eliminating manual paperwork and reducing the risk of error. This streamlined approach saves valuable time and increases productivity. Real-time updates via a mobile app keep employees informed of the status of their orders. This facilitates communication and collaboration between various departments and suppliers, improving efficiency and customer satisfaction.  
  
Mobile apps make the approval process faster and more efficient. Approvers can review and approve orders directly from their mobile devices, regardless of location. This eliminates manual paperwork, simplifies approval workflows, reduces delays, and improves procurement efficiency. Inventory management is also streamlined through a mobile app integrated with our order management system. Employees can easily update inventory information, request reorders, and receive out-of-stock alerts. This real-time visibility prevents stockouts, ensures timely replenishment, and optimizes warehouse operations.  
  
Cost control is an important aspect of procurement, and mobile apps give you better control over the purchasing process. The app allows you to track and analyse your purchase data so you can identify opportunities for cost savings. Businesses can negotiate better contracts with suppliers, monitor spending patterns, and generate reports for data-driven decision-making, ultimately improving profitability.  
  
Mobile apps enable real-time data collection, giving businesses valuable insights into purchasing trends, supplier performance and overall sourcing efficiency. This information can be used to make informed decisions, optimize the purchasing process, and drive continuous improvement.  
  
Overall, deploying an order management system with a mobile app can bring significant benefits. From increasing efficiency and streamlining approval processes, to improving inventory and cost control, businesses can streamline procurement operations, reduce errors and increase productivity. By leveraging this technology advancement, companies can gain a competitive advantage in today's dynamic business environment.

* Briefly discuss how the assignment or project in ITP4510, ITP4522 and ITP4915M modules help you to finish this assignment.

In ITP4510, I have gained a deep understanding of different data structures and algorithms. This knowledge has been invaluable in choosing the appropriate data structure, like a queue, for my Android application. By utilizing the right data structures and algorithms, I can optimize the performance and efficiency of my application.

ITP4522 has been particularly beneficial in teaching me software project management and quality assurance. Through this module, I have learned essential skills in project planning, scheduling, and resource allocation. This knowledge has enabled me to effectively manage my Android application development project, ensuring that it is delivered on time. Additionally, understanding quality assurance practices has helped me guarantee the reliability and accuracy of my application.

The insights gained from ITP4915M have greatly enhanced my understanding of system development projects. This understanding has ensured that I follow best practices and deliver a well-structured and robust app.

By combining the knowledge and skills acquired from these modules, I feel confident in my ability to meet the requirements of my current assignment. The technical expertise gained from ITP4510, the project management skills from ITP4522, and the system development knowledge from ITP4915M have equipped me to succeed in this project.

20 marks will be allocated to extra features not described in section 3. Each student can develop at most 3 additional functions such as animation effect, sound effect or using image buttons on the matching processes or any other relevant and useful functions.

10 marks **will be deducted** if you do not submit your answer of last two questions in section 7:

Driving Question: How can a company get benefit from a purchase order management system by using a mobile app?

Briefly discuss how the assignment or project in ITP4510, ITP4522 and ITP4915M modules help you to finish this assignment.

40 marks **will be deducted** if demonstration is not done.

**END**