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| **Qualification national code and title** | ICT50220 – Diploma Information Technology (Advanced  Programming) |
| **Unit/s national code/s and title/s** | Advanced Mobile Apps:  ICTPRG549 Apply Intermediate Object Orientated Language Skills ICTPRG603 Develop Advanced Mobile Multitouch Applications |

**Assessment type (****):**

* Questioning (Oral/Written)
* Practical Demonstration
* 3rd Party Report
* Other – Project/Portfolio (*please specify)*

**Assessment Resources:**

Word Processor or other text editing software (Microsoft Word etc)

**Assessment Instructions:**

Please answer the following knowledge questions. Read each question carefully and answer in **full** when asked to describe or explain. Submit this document with your answers on blackboard for marking and feedback.

**Assessment Instrument:**

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1. Describe what makes a linked list different from an Array and when to appropriately use it.

The structure of linked list is a sequence of nodes. Each node has a value and a pointer which points towards the next node. The last node will point to none, shows that it is the last node. These nodes are not placed in sequence but connected by pointers. The drawback of linked list is its accessing speed, as to access a value, it will start from the first node, moves from node by node using pointer until it reaches the value which makes it slow. Linked list is fast to insert or delete a node, as it only requires changing the pointers without shifting needed.

The structure of array is a sequence of box places next to each other. Each box represents as memory location with indexes to indicate their position. Each box contains a value. To access a value, it can get it directly from the index. Since the array is a continuous sequence, insert and delete a value requires to shift the position of the values which makes it slow.

If it requires to have fast access on a specific value, has a fixed data size, or dealing with number and math, or doesn’t really need insert and delete, array will be a better option. If it requires a lot of insertion and deletion, unpredictable size of dataset, or structure like stacks and queues, linked list is the better option.

1. Explain what an interface is in OOP and why you would use it in relation to the OOP principles.

An interface in OOP defines a set of methods that a class must implement. It does not contain any behavior nor implementations, only the name, parameters and return type. The classes that implement the interface need to provide implementations for these methods.

1. Describe what is UX and provide one user interface widget(s) or technique(s) to present complex data in a user-friendly manageable way in a GUI.

User experience refers to the overall experience a user has when interacting with the product. It refers to the user friendliness, and how easily to for a user to operate and functions.

A technique to present complex data in a user-friendly manageable way in GUI would be pagination. Pagination can minimize the data shows per page, which only loads the data that needed to display. Since the data require to load is reduced, the waiting time for the data load is shorten which make the product runs much quicker rather than loading every data at every search. Another technique would be filtering and sorting, as these allow users to easily filter and sort the data according to their requirements, helping to fetch data instantly.

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1. What is an API and how does it enable a connected and robust mobile application and through what intermediary language?

API (Application Programming Interface) is a tool that allows different software applications to communicate with each other. API function through request and response cycle between client and server. This ensures app can access real-time information and external functionalities. API makes the complex operation into simple and reusable method. For example, instead of using custom code function, mobile app can use the pre-built function such as CRUD/BREAD provided by API. JSON language will be the most common language for communication between app and API. This is because JSON is lightweight and easy to parse. The code structure is direct and easy to read.

1. Other than mobile phone devices, give one example of another multitouch device.

Tablet

1. Describe software development methodology practices, benefits and how it is implemented in industry.

Software Development Methodology is a structured framework used to plan, execute, and manage projects. The most common software development methodologies are the Waterfall strategy and the Agile strategy. The benefits of using these strategies include ensuring consistency and quality in software delivery.   
  
Different strategies have their own strengths and weaknesses. Waterfall is a linear approach where each phase is completed before moving to the next. The benefit of using waterfall is that it has a clear structure for every phase, easy to manage, and works well for fixed-scope project such as the medical industry. Agile is suitable for software companies as it requires rapid development cycles because it focuses on collaboration, it has the flexibility and requires small delivery, and mostly focusing on the functioning of the software. Agile method is faster delivery, ability of adapt to changes and it relies on the customer’s feedback.