**Short Answer Questions Guidelines**

* Download this assessment to your local computer
* Upload your answers to your repository at the end of each period (Today & Tomorrow)
* Answer the questions using MS Word
* For each question clearly identify each of the points you are answering
* Provide complete sentences for each point with clear details and justification
* Clearly format included Java code samples as required for some questions
* Answer any 8 out of the 9 questions from the list below
* Only the first 8 questions will be marked
* Each question is worth 5 marks
* The total for this summative is 40 marks

**Short Answer Questions**

1. Describe a situation in class where one-dimensional and two-dimensional arrays were used to store and manage data. Structure your answer as follows.
   1. Summarize the work or activity you did that links to the topic.

A situation in class where I used a two-dimensional array to store and manage data was an in progress project, 3D Tic-tac Toe.

Another situation where I used a one-dimensional array to store and manage data was in a project where my group had to create a database that stored student records.

* 1. Explain specifically how the work or activity is related to the topic

A two-dimensional array was used because the game board was a 9x9 grid. The array stored each player’s claimed square. My part of the project was to create the game logic which determined the winning conditions by writing code that checked if the current player has met a winning condition. This required the two-dimensional array since that’s where the game board is stored as.

The information that we needed to store was the name of the student, a unique ID, age, and grade. So an one-dimensional array was need to store each record.

* 1. Provide or explain specific examples of your work. Include sample Java code.

//User selects record to modify

Scanner r = **new** Scanner(System.*in*);

System.*out*.print("Who is the student that you want to modify?(Select the row number)");

**int** row = r.nextInt();

System.*out*.println("Student # " + row);

r.close();

* 1. For additional marks, provide sample Java code to add, change, and delete elements of the array.

1. Describe a situation in class where code was developed to read from and write to and external file. Structure your answer as follows.
   1. Summarize the work or activity you did that links to the topic.

A project where code was developed to read from and write to and external file was the student database.

* 1. Explain specifically how the work or activity is related to the topic

Since the project was to create a student database, my group decided to make the program output to a txt file. Any changes or additions to the data would be saved to the txt file.

* 1. Provide or explain specific examples of your work. Include sample Java code.

1. Describe a situation in class where code was developed to implement classes and objects. Structure your answer as follows.
   1. Summarize the work or activity you did that links to the topic.

A situation in class where code was developed to implement classes and objects was when my group had to develop a student database program where it had functions such as adding and deleting student records, and modifying existing student records. And it made sense for the project to be partitioned into small parts for each person in the group. So classes were made containing each function of the program.

* 1. Explain how classes and objects are related but are also different

Classes and objects are related because a class can be treated as an object since Java is an object oriented language. For example, multiple classes can be used to divide a program into parts instead of making one large class.

They can also be different because a class can contain multiple objects that a similar purpose. In addition, an class can be a template for objects to be created.

* 1. Provide an example of a class that includes a constructor and at least one method. Include sample Java code.

//User selects record to modify

Scanner r = **new** Scanner(System.*in*);

System.*out*.print("Who is the student that you want to modify?(Select the row number)");

**int** row = r.nextInt();

System.*out*.println("Student # " + row);

r.close();

* 1. Explain, using your example class, how an object can be created and used. Include sample Java code.

1. Describe a situation in class where code was developed to implement private and public constants, variables and methods in a Java class. Structure your answer as follows.
   1. Summarize the work or activity you did that links to the topic.
   2. Explain the difference between making a variable “public” or “private”.
   3. Provide sample Java code for public and private constants, variables and methods.
2. Describe a situation in class where code was developed to implement a standard mathematical algorithm or to implement a specification provided by your teacher.
   1. Summarize the work or activity you did that links to the topic.
   2. Explain specifically how the work or activity is related to the topic
   3. Provide or explain specific examples of your work. Include sample Java code.
3. Describe a situation in class where code was developed to implement a graphical user interfaces (GUI). Structure your answer as follows.
   1. Summarize the work or activity you did that links to the topic.

A situation in class where code was developed to implement a graphical user interface was when my group had to develop a calculator that does not use the console of eclipse to input and output information, but instead it had a graphical user interface that represented a physical calculator.

* 1. Explain specifically how the work or activity is related to the topic

The calculator had to have a graphical user interface where it made the user experience intuitive. So we could not use the console that was present in Eclipse IDE. That meant that the group had to use the Standard Widget Toolkit (SWT) to develop a graphical user interface. The end product had a OS window open to display a mouse interactive program.

* 1. Provide or explain specific examples of the widgets used to implement the GUI. Include sample Java code.
  2. For additional marks, provide sample Java code to add, change, and delete elements of the widgets.

1. Explain the importance of designing reusable and partitioned code in computer programs. Structure your answer as follows.
   1. Explain the benefits of separating code into well-defined classes and objects

The benefits of separating code into well-defined classes and objects are that it makes it easier for a team of developers to be efficient. To elaborate, if the program is divided into well-defined classes, each member of the development team can easily identify what the class is and what it can do. It can make debugging a large project consume less time, leading to better efficiency.

* 1. Explain the importance of having well defined interfaces (e.g. public methods)
  2. Describe a situation in class where you implemented code based on a specification that was provided.
  3. Describe a situation in class where you documented the interface and specification for code you developed.

1. Describe a situation in class where you participated in a multi-student project involving Java code. Structure your answer as follows.
   1. Summarize the work or activity you did that links to the topic.

A situation in class where I participated in a multi-student project that involved Java code was the student database. The program needed to store student records and have functionality such as adding and deleting records, modifying existing records, and generating unique IDs for new student records.

* 1. Explain the software development plan that was created for the project

The software development plan was to assign the workload to each person in the group. For example, I was assigned to write code for the modifying records function.

* 1. Explain how students communicated with each other regarding the status of their individual assigned tasks.

Students created mini presentations to display what parts of their own code does what and how it can be integrated in the program. Other than that, we communicated while working on our own program. Me and Robin discovered how similar our assigned functions are so we collaborated closely. Also, everyone’s code was continually updated on a repository on GitHub.

* 1. Explain how the code developed by different students was merged into one project

Since the program was divided among the group, each person made separate classes that contained their assigned function. In addition, one person of the group had the main() in their part of the code.

* 1. Explain how industry-standard programming tools (e.g. Eclipse, GitHub) are used to support multi-student software projects.

Industry-standard programming tools such as Eclipse and GitHub are used to support multi-student software projects because they are widely used in the industry so the support of the community is present. To elaborate, a student can search for aid when it comes to sample code. In addition, GitHub allows each student of the project to upload their part of the program so others students that rely on their part of the program can easily retrieve it. This allows students to closely collaborate on the program instead of copying it off each other’s screen. Finally, students can use eclipse to easily debug and find errors within their program.

1. Describe a situation in class where you worked independently to develop Java code. Structure your answer as follows.
   1. Explain how you used help functions and reference documentation to resolve syntax issues (coding issues) while programming. Provide specific examples.
   2. Explain how you used reference documentation to find sample code that you could use and modify implement parts of your program. Provide specific examples.
   3. Explain how you used the Eclipse environment to debug your program