



Your Name: _____
ID#: _____

TA's Name: _____
Section #: _____

SOLUTION: Take Home: Quiz 5 (15 pts) - C++, Data Structures, and OOP

Using Canvas <https://canvas.wsu.edu/>, please submit your solution to the correct quiz folder. Your solution should be a .pdf file with the name <your last name>_quiz5.pdf and uploaded. To upload your solution, please navigate to your correct Canvas *lab* course space. Select the “Assignments” link in the main left menu bar. Navigate to the correct quiz submission folder. Click the “Start Assignment” button. Click the “Upload File” button. Choose the appropriate .pdf file with your solution. Finally, click the “Submit Assignment” button.

1. (5 pts) In your own words, what is a function *template*?

A function *template* provides a method of defining a set of functions through generic types. A template provides the structure for the functions without specifying specific types. This means that the template can be used to generate instances of the function without reproducing the entire code base for each specific type. When an instance of the function is created, the compiler generates a corresponding function from the template that replaces the generic types with specific types.

3. (5 pts) In your own words, what is a *queue* data structure? What are computer applications of queues?

A *queue* data structure organizes data in a linear arrangement, and processes data in a first-in/first-out (FIFO) or first-come/first-served method. Data is added to the structure at the end and removed from the front, similar to how people are processed at a checkout line in a grocery store.

There are many computer applications for queues including: handling print jobs for a shared printer, processing events for event driven applications, etc.

4. (5 pts) In your own words, what is a *destructor*?

A *destructor* is a special member function that is used to perform “housekeeping” when an object is destroyed (by going out of scope or through the `delete` operation). A destructor is used to deallocate memory, close streams, etc. It **MUST** also be named the same as the class (with a tilde (~) in front) it cannot return a value, and it is called *implicitly* when an object is destroyed.