# Assignment 4 for CPTN278

**Name:** Queue Implementation with an Array

**References:**

* The text book
* In class notes
* Any other resource you can find other than people

### Assignment Description:

You are to create an application in C++ that uses a Queue Data Structure. You will also be required to provide a detailed description of the program along with conclusions.

The application will simulate a toll booth on a highway.

The application will create four queues of vehicles. The first three queues will be input queues to the toll booth. Vehicles will be added to the correct queue based on vehicle category.

* Cars – paying in cash of the same amount
* Trucks – paying in cash of different amounts
* Vehicles – using speed pass paying different amounts

As the vehicles go through the toll booth, a running tally of the amount of fees collected will calculated for each line.

As a verification feature, a fourth queue will be used for all vehicles that left the toll booth. All vehicles will be then checked for amount paid and the total calculated. The total when will be compared to the sum of the calculated individual queue totals. They should match!

Additional requirement details will be provided in class as well as on program format and construction.

### Assignment Deliverables:

1. A C++ class header file containing your class data members and member function definitions. The base name of this file must be **CPTN278\_A4\_Queue\_*lastname*.h** where *lastname* is your actual last name.
2. A C++ class body source file containing your class source code. The base name of this file must be **CPTN278\_A4\_Queue\_*lastname*.cpp** where *lastname* is your actual last name.
3. A C++ class header file containing your class data members and member function definitions. The base name of this file must be **CPTN278\_A4\_Node\_*lastname*.h** where *lastname* is your actual last name.
4. A C++ class body source file containing your class source code. The base name of this file must be **CPTN278\_A4\_Node\_*lastname*.cpp** where *lastname* is your actual last name.
5. A C++ application program source file containing your application source code. The base name of this file must be **CPTN278\_A4\_Application\_*lastname*.cpp** where *lastname* is your actual last name.
6. A Microsoft Word 2010 document with the following contents and sections. Each major bullet needs to be a new section. The name of this file must be **CPTN278\_A4\_Description\_*lastname*.docx** where *lastname* is your actual last name.

* Title page
  + Document name
  + Author
  + Creation Date
  + Course Number
* Table of Contents
* Introduction
* A one paragraph description of what the application does
* A description of the program variables and objects
* A description of the class and application source code including
  + The list and correct sequence of steps used to accomplish the task
  + A description of what occurs in a section of code
  + A description of how the variables and objects “change” as a result of executing each section of code
* Captured Program Output
* Conclusions about the application
* Conclusion
* References documented using APA style
* Appendix (if needed)

### Strenuously Recommended Approach:

See Assignments 2 and 3 for details.

Post the deliverables to Blackboard via the “Assignment 4” link.

You will be submitting six files. They are:

* CPTN278\_A4\_Queue\_lastname.h – The queue class header file
* CPTN278\_A4\_Queue\_lastname.cpp – The queue class body file
* CPTN278\_A4\_Node\_lastname.h – The node class header file
* CPTN278\_A4\_Node\_lastname.cpp – The node class body file
* CPTN278\_A4\_Application\_lastname.cpp – The application source file
* CPTN278\_A4\_Description\_lastname.docx – Your design document

Use the above link for assignment submissions. Do not submit assignments via the Blackboard Digital Drop Box or forums. Do not use e-mail attachments. Do not hand in hard copies of documents. Please zip them into a single file that has the .zip extension. That is, do not use any other zip utilities other than the default from Microsoft Windows. They should not have extensions like .tar, .gz7, .gzip, .rar or anything else, requiring me to use any other zip utilities. The zipped file should only contain these files. Do not include any files other than theses files like .sln or .vcproj files.