

# Programming Assignment 3

Due 21 SEP @ 11:59pm

Write a program that implements the Queue API (“QueueAPI.java”, provided with documentation) using singly linked nodes and head/tail references as covered in lecture. A code template has been provided for you - place your code in the appropriate methods. If a method indicates an exception for some condition be sure to check and throw this when the condition occurs.

The Queue API extends the Iterable<Type> interface and adds the iterator() method. You need to provide an implementation using either an anonymous class or a private inner class. The returned iterator should throw an UnsupportedOperationException for the remove method and does not need to check for concurrent modifications. The next() method should also throw NoSuchElementException if the iterator has no more elements.

The iterator method, along with the other Queue API methods, have default implementations in Queue.java. You need to modify them to correctly implement the operations.

The methods defined in QueueAPI.java already have javadoc – use them (copy/paste is fine) in your own implementation for the method documentation. However, documentation rules still apply for any methods you add and the code in the methods that you add.

The toString and main method have already been implemented for you, do not change. The main method takes in the file “operations.txt” for unit testing your code. Additionally, a “Stdio.java” file is provided and used in the main, do not modify. You cannot change the signature of the class, constructor, or existing method signatures. You will also need to add one or more inner classes.

## Grading Notes

You must:

- Use the template provided for you
- Have a style (indentation, good variable names, etc.)
- Comment your code well (no need to over do it, just do it well)

You may not:

- Make your program part of a package.
- Use *code* from anywhere except your own brain.

Submission Instructions:

- Name a folder with your gmu username
- Put your java files in the folder (but not your .class)
- Zip the folder (not just the files) and name the zip “username-pa3.zip”
- Submit to blackboard

## Grading Rubric

No Credit:

- Non-submitted assignments
- Late assignments
- Non-compiling assignments
- Non-independent work

## Example Run

```
> java Queue operations.txt
enqueue andy
enqueue mike
enqueue bob
size 3
dequeue andy
enqueue liz
dequeue mike
dequeue bob
enqueue larry
enqueue moe
enqueue curly
size 4
dequeue liz
dequeue larry
dequeue moe
dequeue curly
enqueue alpha
enqueue bravo
enqueue charlie
size 3
Queue=[alpha, bravo, charlie]
```

1pt	Submission Format
1pt	Style and Comments
1pt	Node class
2pts	enqueue method
2pts	dequeue method
2pts	Iterator class/methods
1pt	size, peek, isEmpty methods