# CPSC 221
# Basic Analysis of Algoritms

*"Though this be madness, yet there is method in't."*
--William Shakespeare, *Hamlet*, Act II, Scene 2

## Objectives

- Analyze growth function and order of Java methods

## Tasks

For this assignment, you will analyze the runtime growth rate of methods defined in the MethodsToAnalyze.java file.

- Answer all questions in Word file Analysis.docx. These questions walk you through the analysis of each method. Answers are expected to be in well-written, correct English. These are not one-word answers. See the sample analysis.
- Make sure to support your answers with specific references to the code.
- You are *strongly* encouraged to walk through the algorithms in the debugger to get a clear understanding of how they work.
  You are also *strongly* encouraged to collect data for increasing problem sizes to support your analysis. The sample analysis, below, demonstrates a driver class for data collection and modified statement counting code in the target method. Be sure you do not count your added statements or modify the code in such a way as to alter its original growth function (i.e. leave loop conditions and method calls alone).

## Example Analysis

**DoSomething - A Poor Attempt at Ordering an Array of `int`s**

- Given the following class files:
  - `DoSomething.java` - contains the method being analyzed
  - `DoSomethingTest.java` - driver class to collect data
  - `ArrayOfInts.java` - utility class for getting various arrays for testing

You will see that the *DoSomething.java* file has been modified so that the number of statements executed in a call to *doSomething()* can be collected for different sized arrays in the *DoSomethingTest.java* driver class.

- The SampleAnalysis.docx file contains an analysis of the `doSomething` method.

## Grading

Points will be awarded according to the following breakdown:

| Tasks | Points |
|---|---|
| Analysis of *find()* | 5 |
| Analysis of *replaceAll()* | 5 |
| Analysis of *sortIt()* | 5 |
| Overall quality and completeness. | 5 |

## Required Files

Submit copies of the following files in a zip file as described in the assignment instructions:

- Analysis.docx
- MethodsToAnalyze.java (including any modifications you made to collect data)
- *Any other test classes used in your analysis*