

# Java Coding Exercises

## COMP 250, Winter 2022

Prepared by T.A.s Ria, Liam, Ricky & Prof. Mike Langer

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### General instructions

Here are some basic practice Java coding exercises for you to practice Java syntax. By the start of week 4 (January 24), you should be able to do most of them.

- The starter code contains some constants ("final variables" in Java) which are useful for certain questions.
- We have posted solutions, but we strongly suggest that you do not look at the solutions for a question until you have given it your best shot!
- Feel free to post questions or alternative solution code for these exercises on the discussion board. As should be obvious, these exercises are not being graded, and so there's no problem with students seeing each other's code. Indeed it might be helpful for you to see the solutions of other students.

### Problems

1. Write a method **toMiles(float km)** that converts from kilometers to miles using the formula  $1 \text{ km} = 0.6214 \text{ miles}$ . Your method should take as input a float number and return a double number.
2. Write a method **toTime(int i)** that takes a time in seconds and converts it to hours minutes seconds. Your method should return a string in the format `hours::minutes::seconds`.  
Hint: use the `String.valueOf(int i)` method.
3. Write a method **stats( int[] a)** that takes an array of integers as input and prints out the smallest integer, the largest integer, and the average of all of the integers in the array.
4. Write a method **countWord(String s, String w)** that takes two strings – a sentence and a word – and returns an integer corresponding to how many times the word appears in the sentence. For the sake of simplicity you can assume there is no punctuation.  
Use the `String.split(" ")` method to partition the sentence into words with a white space as splitter. Other approaches are possible.

## 5. Binary-Decimal Conversion

- (a) Write a method **toBinary(int i)** that takes as argument a positive integer and returns its representation in binary as a string.

Hint: use the `String.valueOf(int i)` method.

- (b) Write a method **toDecimal()** that does the opposite of the previous question, that is, it takes an integer representing a binary number and will return its decimal representation as a `int`.

Hint: use the `String.charAt(int index)` method.

6. Write a method **isPrime(int i)** that takes as input an integer and returns a boolean indicating whether or not it is prime.

Hint: You only need to check the values up to `Math.sqrt(x)`. Do you see why?

7. Write a method **reverseArray(char[] a)** that takes as argument a character array and return its reversed character array.

Challenge: do this in place.

8. Write a method **countMultiples(int[] a, int i)** that takes as argument an integer array and a specific `int i` returns the number of elements in the array that are divisible by `i`.