STAT 33B Prerequisite Exam

This is an optional exam to help you determine whether you satisfy the prerequisites for STAT 33B.

If you are prepared for 33B, you should be able to solve the exercises in this exam in under an hour. For exercises that require programming, use whatever language you prefer.

Exercise 1

Write a function that converts a temperature in Fahrenheit to a Kelvin. The conversion formula is $k = (f - 32)(5/9) + 273.15$.

Test your function on at least 3 different temperatures, and use Google to confirm that the converted values are correct.

Exercise 2

The nth triangular number is equal to the sum of the n natural numbers from 1 to n. Thus the first 10 triangular numbers are:

1, 3, 6, 10, 15, 21, 28, 36, 45, 55

Write a function with a parameter k that prints out the first k triangular numbers. Test your function for $k = 10$, $k = 50$, and $k = 1000$.

Exercise 3

Fizzbuzz is word game to help children learn about division. Players count off numbers, replacing each number divisible by 3 with "fizz", each number divisible by 5 with "buzz", and each number divisible by 3 and 5 with "fizzbuz".

Thus the fizzbuzz sequence for the first 16 numbers is:

1, 2, fizz, 4, buzz, fizz, 7, 8, fizz, buzz, 11, fizz, 13, 14, fizzbuz, 16

Write a program that prints the fizzbuzz sequence for the first 200 numbers.