Exercises on decisions and loops

1. Write a program called CheckPassFail which prints "PASS" if the int variable "mark" is more than or equal to 50; or prints "FAIL" otherwise. The program shall always print “DONE” before exiting.
2. Write a program called PrintNumberInWord which prints "ONE", "TWO",... , "NINE", "OTHER" if the int variable "number" is 1, 2,... , 9, or other, respecvely. Use (a) a "nested-if" statement; (b) a "switch-case" statement.
3. Write a program called SumAndAverage to produce the sum of 1, 2, 3, ..., to 100. Also compute and display the average.

The output shall look like:

The sum is 5050

The average is 50.5

1. Write a program called Product1ToN to compute the product of integers 1 to 10 (i.e., 1×2×3×...×10). Try compung the product from 1 to 11, 1 to 12, 1 to 13 and 1 to 14. Write down the product obtained and explain the results.

Hints: Declare an int variable called product (to accumulate the product) and initialize to 1.

Try: Compute the product from 1 to 11, 1 to 12, 1 to 13 and 1 to 14. Write down the product obtained and decide if the results are correct.

Try: Repeat the above, but use long to store the product. Compare the products obtained.

Hints: Product of 1 to 13 (=6227020800) is outside the range of int [-2147483648, 2147483647], but within the range of long. Take note that computer programs may not produce the correct answer even though everything seems correct!

1. Write a program called HarmonicSum to compute the sum of a harmonic series, as shown below, where n=50000. The program shall compute the sum from left-to-right as well as from the right-to-left.

Obtain the difference between these two sums and explain the difference. Which sum is more accurate?

1. Write a program called Fibonacci to display the first 20 Fibonacci numbers

Also compute their average. The output shall look like:

The first 20 Fibonacci numbers are: 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765

The average is 885.5