Introduction to Programming 1 – Worksheet 10

Part 1 – Functions

This worksheet is about breaking down problems and writing functions. You should decide what should be written as functions. Good choices should be reusable in multiple questions.

Question 1

Write a program named Q1.c to read in a positive integer and print if it is a perfect number or not.

Perfect Number

In number theory, a perfect number is a positive integer that is equal to the sum of its proper positive divisors (not including itself). For example, the number 6 has the divisors 1, 2 and 3. When added together they equal the number 6. Additionally, the number 28 has the divisors 1 + 2 + 4 + 7 + 14. These added together also equal 28.

Question 2

Write a program named Q2.c to find the factorial of a positive integer and print it to the screen.

Factorial

In mathematics, the factorial of a non-negative integer n, denoted by n!, is the product of all positive integers less than or equal to n. For example,

5! = 5 * 4 * 3 * 2 * 1 = 120.

Question 3

Write a program named Q3.c to find the smallest "interesting" number which is bigger than 145.

Interesting Numbers

An "Interesting number" n is a number is a number that has the property that if you add the factorials of the digits in n they equal n.
E.g. 145 is "interesting" because 1! = 1, 4! = 24, 5! = 120. When you add these you get 145.