COMP10120 Practical Set 1, Variables, Operators and Conditionals

Please read the questions carefully. Name each program based on your student number, the practical set number and question number. For this set (set 1), question 1 should be named 1234567s1q1.c where your student number replaces 1234567. All questions that you are submitting must be zipped into a single file called 1234567s1.zip, where 1234567 is your student number and s1 refers to set 1. This zipped file can be submitted via Moodle for grading.

Complete the Programs 1 to 4 below.

1. Write a C program that inputs the height of 3 children in a class (in cm). The programme should then calculate the tallest, shortest and the average height.

   Input three heights: 150 156 132
   Average is 146
   Tallest is 156
   Shortest is 132

2. Write a C program that allows you to enter your student number from the keyboard and then prints each individual digit on a new line. It should also sum the numbers.

   For example, if the user types in **12345678**, the program should print:

   1
   2
   3
   4
   5
   6
   7
   8
   Sum = 36
   *(Hint: 12345670/10000000 = **1**.2345678 and 2345678/1000000 = **2**.3456 ……)*

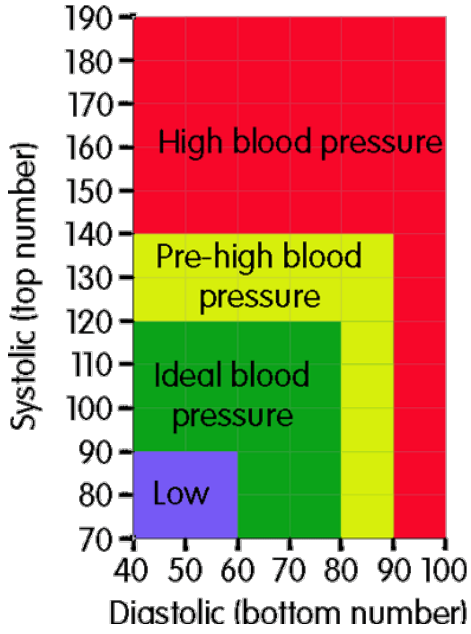
3. A quarry sells cement in 10KG bags. To attract larger orders, they offer a discount if customers buy more bags using the following scheme:

   - 1-10 Bags - €10 per bag
   - 11-50 Bags - €10 for each of the first 10 bags and €9.50 for each remaining bag
   - 51+ Bags - €10 for each of the first 10 bags, €9.50 for each of the next 40 bags and €9 for the remainder.

   Write a C program that asks the quarry worker to input the number of bags to be purchased and calculated the total cost. A sample screen would look like:

   Number of Bags: 52
   Total Cost: €498

4. Blood pressure (BP) is the pressure of circulating blood on the walls of blood vessels. When used without further specification, "blood pressure" usually refers to the arterial pressure in the systemic circulation. Blood pressure is usually expressed in terms of the systolic (maximum during one heart beat) pressure over diastolic (minimum in between two heart beats) pressure and is measured in millimeters of mercury (mmHg), above the surrounding atmospheric pressure (considered to be zero for convenience). Write a C Program which takes in the systolic and diastolic measures from the keyboard and determines if the blood pressure is high, pre-high, ideal or low based on the data on chart below.
http://www.bloodpressureuk.org/BloodPressureandyou/Thebasics/Bloodpressurechart
As you can see from the blood pressure chart, **only one of the numbers has to be higher or lower than it should be** to count as either high blood pressure or low blood pressure.



5. The UN state children are defined as living in over-crowded dwellings when there is a ratio of more than two people per room (excluding bathrooms but including kitchen and living room). The over-crowding ratio is obtained by dividing the total number of household members by the total number of rooms occupied by the household. Thus, a dwelling with two bedrooms, a kitchen and sitting-room would be defined as over-crowded if there were more than eight people living in it. Write a C program that calculates if a child is living in an over-crowded dwelling based on user input from the keyboard i.e number of rooms in the house, number of people living in the house. The program should output an indication if the child lives in an over-crowded dwelling or not.