

Assignment 1 - Introduction to Programming with C++

Deadline: July 10 by 11:59pm  
Type: Individual Assignment  
Weight: 4%

**Submission instructions:**

- Create a cpp file for each question
- Compress the files using zip or other tools
- Submit the zip file on Moodle
- Do not submit executable files
- All submissions must be done through Moodle

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**Questions:**

**1. (20 marks)** Write a program that asks the user to enter two integers and prints the difference, product, division, average and the summation of square of these two numbers. Here is an example of the execution of the program:

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Enter the first number: 10  
Enter the second number: 5

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The results are:

Difference: 5  
Product: 50  
Division: 2  
Average: 7.5  
Sum of square: 125

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**2. (20 marks)** Write a program that takes the income of an employee and calculates the corresponding net income and tax portion based on the following information:

- tax = 45%: income  $\geq$  110,000 \$
- tax = 35%: 90 K  $\leq$  income  $<$  110 K
- tax = 25%: 70 K  $\leq$  income  $<$  90 K
- tax = 15%: 40 K  $\leq$  income  $<$  70 K
- tax = 5%: income  $<$  40 K

3. **(25 marks)** Write a program that converts 5 given values in kilograms to grams and vice versa. It asks the user to enter 5 integer values and one character as the unit for each value ('G' (grams) or 'K' (kilograms)). If the user enters 'G' as the unit, the program shows the corresponding value in kilograms and vice versa. Here is an example of expected output (values in gray are entered by the user):

values	Unit	Equivalent
6	k	6000 gr
75	G	0.075 kg
9.5	k	9500 gr
650	G	0.65 kg
7500	G	7.5 kg

4. **(15 marks)** Write a program that takes an integer as input and returns whether it is a prime number or not.
5. **(20 marks)** Write a C++ program that asks the user to enter his/her height in meters and his/her weight in kilograms and calculates the BMI index based on the following formula:

$$\text{BMI} = \frac{\text{mass(kg)}}{(\text{height(m)})^2}$$