Object Oriented Programming in C++ Laboratory

— 25 points

Tutorial-1 (Complete by 15 Aug 2023)

1. (2 points) Write a program which takes as input a number of days and converts it into number(s) of year(s), week(s) and day(s). For example, if the input is 385 then the output should be: 1 year 2 weeks 6 days. Assume, non-leap years.

2. (5 points) Write a program to evaluate the following expression, where x is a real number: $x + \frac{1}{x+\frac{1}{x+\frac{1}{x}}}$

3. (5 points) Write a program to read the vowels { a, e, i, o, u } in five suitably declared variables "vowels1" through "vowels5". Are "vowel2 - vowel1", "vowel5 - vowel2" etc., valid C++ expressions? What are the values of "vowel2 - vowel1", "vowel5 - vowel2"? Suppose we have five more variables "capVowel1" through "capVowel5", of the same type as that of "vowels1" through "vowels5" to store { A, E, I, O, U }. Does the expression "capVowel2 - capVowel1" have the same value as that of "vowel2 - vowel1"? Explain your answers.

   Evaluate the following expression in your program: "x = y - 20 * 6/9", by taking some value of y. Print the value of x. Do you see the expected result? Bring about minimum change(s) to modify your program to make it print the correct result.

4. (6 points) Write a program which prints the in-memory binary representation of a positive and a negative integer. Verify whether negative numbers are stored in Two's compliment representation. (6 points)

5. (6 points) To round off a floating point number to the nearest integer, one adds 0.5 to the number and truncates it to an integer. Write a program which reads a real number and a positive k and rounds it off *using this knowledge*, to the nearest k-th place. Thus, if the number read is 23.59478261 and $k = 1000$, the rounding off is at the 1000-th place (after decimal) and thus the rounded off number is 23.595. (6 points)

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