Object oriented programming and software engineering

Laboratory No. 2

C ++ Basics

As part of laboratory no. 2, perform the following tasks (basics of programming in C ++). You can use any source code editor, as well as publicly available libraries.

1. Write a program calculating the quadratic equation:
- variables a, b, c given by the user (from the keyboard) and checking the condition of the number of solutions (delta) - conditional statement if.
2. Write a program that will display the name, surname and age entered by the user on the screen. Declare the appropriate variables to store these values and display information about the user on the screen. For example: "The user name is {first name} {last name} and is {age} years old". The program should ask the appropriate questions to the user and be able to display the age in years or months.
3. Write a program in C++ that converts from miles to kilometers. Your program should have a reasonable prompt for the user to enter a number of miles. Also write a program that converts the values the other way. Modify the program so that the user can select a program variant.
4. Write a program that prompts the user to enter two integer values. Store these values in int variables named val1 and val2. Write your program to determine the smaller, larger, sum, difference, product, and ratio of these values and report them to the user.
5. Write a program that prompts the user to enter five integer values, and then outputs the values in numerical sequence separated by commas. So, if the user enters the values 5 10 2 4 6, the output should be 2, 4, 5, 6, 10.
6. Write a similar program to the previous one, with the difference that as input parameters you should enter the names of four colleagues. The result should be the listing of these names in alphabetical order, and also sort by first name length.
7. Write a program to test an integer value to determine if it is odd or even. As always, make sure your output is clear and complete: "The value 2 is even number".
8. Write a program that uses previously written programs. To do this, modify the four pre-selected programs to functions, and then put them in a separate file. In the main program, refer to the user menu, where you will be able to select the appropriate option / task.
9. Make a vector holding the ten string values "zero", "one", "two", "three" … "nine". Use that in a program that converts a digit to its corresponding spelled-out value; e.g., the input 8 gives the output eight. Have the same program, using the same input loop, convert spelled-out numbers into their digit form; e.g., the input eight gives the output 8. (vector<string> values).
10. Create a program to find all the prime numbers between 1 and 100. There is a classic method for doing this, called the "Sieve of Eratosthenes." If you don't know that method, get on the web and look it up. Write your program using this method.

Source codes from all points should be attached to the report (on the UPEL platform).