

Tutorial 8 Functions

Please test the correctness of your **program in 1, 2a) and 2b)** using PASS.

1) Download **calc.cpp**. *Complete the function definitions* such that it computes addition, subtraction, multiplication and divide of two real numbers.

Output the result in 2 decimal places. Example inputs (underlined) and outputs are as follows.

$\begin{array}{r} 1+2 \\ \hline 3.00 \end{array}$

$\begin{array}{r} 2.5-1 \\ \hline 1.50 \end{array}$

$\begin{array}{r} 2*3 \\ \hline 6.00 \end{array}$

$\begin{array}{r} 5/2 \\ \hline 2.50 \end{array}$

2a) Download and complete the program **printNum.cpp**, which intends to print integers in English, corresponding to user input (*range: 1..19*)

The program consists of the following functions:

- **print1to9**: accepts an integer from 1 to 9 as input and print the number in English. This function has been defined for you. (*but not 100% correct !!*)

Let's fix the bug(s) in function **print1to9**. After that, you create another function called **print10to19**. The function accepts an integer from 10 to 19 as input and print the number in English.

The user input should be done in the main() function (*don't put cin in print1to9 or print10to19 !*). After the number is read, the appropriate functions should be called for result printing.

Sample input/output:

$\begin{array}{r} 4 \\ \hline \text{Four} \end{array}$
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$\begin{array}{r} 15 \\ \hline \text{Fifteen} \end{array}$
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2b) Modify the program in 2a) such that it accepts an integer (1..99) from the user and print the English representation accordingly.

You should define an extra function as follows.

- **print20to99**: accepts an integer from 20 to 99 as input and print the number in English

(hint: you may break down the number into unit digit and tenth digit and call the **print1to9** and **print10to19** functions you defined in part (a) to generate the output)

Similar to 2a), the user input should be done in the main function. After the number is read, the appropriate function(s) should be called for printing the result.

Sample input and output:

58 Fifty Eight

3) Download **sortArray.cpp** from Blackboard. The program intends to use Bubble Sort to arrange the numbers in array **Num[]** in ascending order. As in typical Bubble Sort, the program compares number pairs repeatedly and it swaps the numbers if they're placed out-of-order.

Your task today is as follows:

- Complete the void **Swap()** function which exchanges the values of two integers using pass-by-reference.
- Complete the Bubble sort by filling correct indexes in the 2 for-loops / array elements.
- Interested students may also modify the program such that the elements are sorted in descending order, rather than ascending. (Note: No need to upload this program to PASS)