

The American University in Cairo  
Computer Science & Engineering Department  
CSCE 106/1001 – Fundamentals of Computer Science

**Lab Session 8**

**Programming of Repetition (loops)**

**Objectives:**

- To learn how to use the C++ **for**, **while**, and **do-while** loops.
- To learn how to use the **Logical Operators (&&, ||, !)** to form composite conditions.

**Problems:**

1. Write a C++ program to print all the integer numbers that are divisible by 7 in the range 1 to 100.
2. Write a C++ program to print all the integer numbers that are divisible by 5 and 9 in the range 1 to 100.
3. Write a C++ program to print all the integer numbers that are divisible by 5 and not divisible by 9 in the range 1 to 100.
4. Write a C++ program to print the count and sum of all the integer numbers that are divisible by 7 in the range 1 to 200.
5. Write a C++ program to generate and print out the following series:  
1      2      4      8      16      32      64      128      256
6. Write a C++ program to generate and print out the following series:  
5      7      10      14      15      20      21      25      28      30
7. Write a C++ program to generate and print out the following series:  
6      8      11      15      16      21      22      26      29      31
8. Write a C++ program to enter 24 readings of temperature (each reading is between -5 and 45), compute and print out the average temperature, maximum temperature and minimum temperature of the day. Enforce the necessary validation on the user input. Use proper format for the output.
9. Write a complete C++ program that produces a table showing the temperature equivalents in degrees Fahrenheit and degrees in Celsius. Let the user enter the starting, ending, and step values. Use the formula:  
**celsTemp = 5.0/9.0 (farenTemp – 32.00)**
10. Write a C++ program that takes a positive integer number, computes and prints out the sum of its digits.
11. Write a C++ program that takes a big integer number (num) and displays the greatest digit in that big number (**num**). For example, if it takes **10567595** as the big integer, then it displays **9** and if it takes **4054351**, it displays **5**.
12. There are 900 people in a town whose population increases by 10 percent each year. Write a C++ program that displays the annual population and determines how many years (countYears) it will take for the population to pass 20,000. Verify that your program works if the population doubles each year (an increase of 100%).

**Instructions:**

- The TA solves problems 1, 4, and 10 (**30 minutes**)
- The TA asks students to solve and **submit in-Lab** problems 2, 11 (**30 minutes**)
- The TA can provide hints how to get maximum and minimum temperature readings in problem 8.
- The TA asks students to solve the rest of the problems and **submit**.