CT103: Week 10 Lab Session (21/11/2023)

*Note: This assignment will count towards your final grade. Make sure you submit your solution by following the "**Submission Instructions**" at the end of this document. You have **until midnight tonight to submit your solution on Canvas**.*

Late assignment submissions will receive a penalty.

Please make sure you **write comments** explaining what your code does. Start your C program with a **comment stating your; Name, Student ID and Date**.

Write a C program that does the following:

1. Write a function called **setPasscode**. This function should generate a random passcode between 0 and **N**. 'N' is the largest possible passcode and is passed to the function as an integer. The function should return the random passcode. Call this function in main(). (**20 marks**)

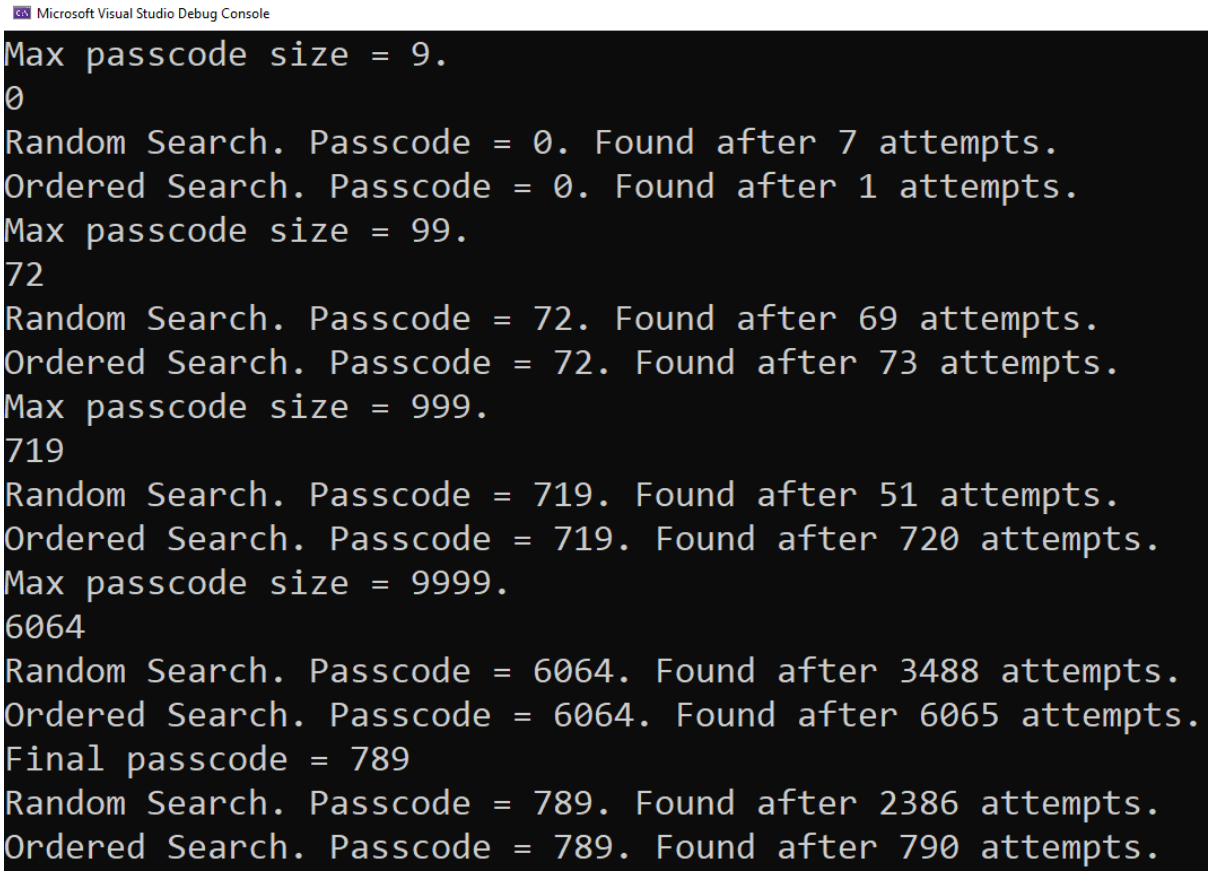
2. Create a new function called '**randomPasscodeSearch'** that accepts a passcode and max possible passcode as parameters. This function must generate random passcodes until the correct passcode if found. Print the passcode to the screen and the number of attempts it took to find it. Call this function in main(). (**25 marks**)

3. Create another function called '**orderedPasscodeSearch**' that accepts a passcode and number of passcode digits as parameters. This function must check every code in order from 0 until the correct passcode if found, i.e. 0, 1, 2, … , N. Print the passcode to the screen and the number of attempts it took to find it. Call this function in main(). (**25 marks**)

4. Test your program by creating 4 passcodes. The first between [0, 9], second between [0, 99], third [0, 999], and fourth [0, 9999]. For each of these passcodes, use both 'randomPasscodeSearch' and 'orderedPasscodeSearch' functions. (**20 marks**)

5. Test your program once more by setting the passcode to the final 3 digits of your student ID. Again, use both 'randomPasscodeSearch' and 'orderedPasscodeSearch' functions to search for the passcode. Note, if your student ID contains '0's, use next non-zero numbers. (**10 marks**)

Your program should output something similar to the following screenshot. You must **upload a single screenshot** showing your program working for each of the requirements in tasks 1 – 5 above. It should look similar to this screenshot.



Plagiarism Notice:

A definition of plagiarism is passing off the work of another personas one's own.

You are allowed to ask the lab tutors for help, collaborate with your classmates and review online and print resources for high-level problem solving and background research. You are each expected to complete this assignment individually. This means that every line of code and comment in your submission should be written by you alone. Please see the University of Galway Code of Practice for Dealing with Plagiarism for further information on plagiarism: https://www.universityofgalway.ie/media/registrar/policiesmay2023/QA220-Academic-Integrity-Policy-v2.0-Sept-2023.pdf

Plagiarism is a serious academic offence and may lead to a loss of some or all marks and/or disciplinary proceedings if it is detected in any of your submissions. Students who facilitate others to copy their work are also subject to plagiarism sanctions (including loss of marks), so you should not share your assignment solutions with classmates.

Submission Instructions:

Please do the following to submit your solutions to the assignment.

- Copy and paste your code into a word document labelled 'AssignmentX_YOURNAME_ID.doc', e.g. 'Assignment7_JoeBloggs_123456789.doc'.

- Make sure to **include screenshots of your code working** in the .doc file. Use: 'Windows' + 'Shift' + 'S' on your keyboard. On a Mac, you should use the keys: 'shift' + 'command' + '3' or 'shift' + 'command' + '4'.

- Add both: **your .c program and your .doc files** to a folder called 'AssignmentX_YOURNAME_ID_Submission'.

- Zip the folder up and **submit the .zip file on Canvas** under CT103 Assessments. To zip the folder, right click and press 'Send To' then 'Compressed (zipped) folder'. On Mac, right click the folder and press 'Compress'.

- If for some reason you still cannot access Canvas. Send your .zip folder to the lab instructors by email. They will be available for the duration of the lab.