

## CT103: Week 10 Lab Session (30/11/2021)

*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 6pm Tuesday 30/11/2021 to submit your solution on Blackboard.***

***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 is 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 is 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. **(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.

```

Max passcode size = 9.
0
Random Search. Passcode = 0. Found after 7 attempts.
Ordered Search. Passcode = 0. Found after 1 attempts.
Max passcode size = 99.
72
Random Search. Passcode = 72. Found after 69 attempts.
Ordered Search. Passcode = 72. Found after 73 attempts.
Max passcode size = 999.
719
Random Search. Passcode = 719. Found after 51 attempts.
Ordered Search. Passcode = 719. Found after 720 attempts.
Max passcode size = 9999.
6064
Random Search. Passcode = 6064. Found after 3488 attempts.
Ordered Search. Passcode = 6064. Found after 6065 attempts.
Final passcode = 789
Random Search. Passcode = 789. Found after 2386 attempts.
Ordered Search. Passcode = 789. Found after 790 attempts.

```

## Plagiarism Notice:

A definition of plagiarism is passing off the work of another person as 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 NUI Galway Code of Practice for Dealing with Plagiarism for further information on plagiarism: <https://www.nuigalway.ie/plagiarism/>

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:**

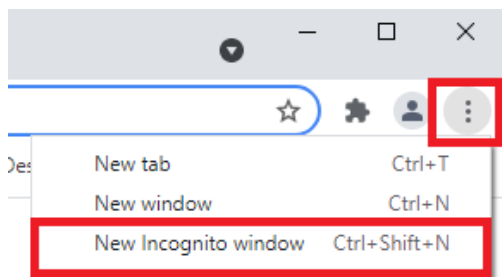
Please do the following to submit your solutions to the assignment.

- Copy and paste your code into a word document labelled 'AssignmentX\_YOURNAME\_ID.doc', e.g. 'Assignment6\_JoeBloggs\_123456789.doc'.
- Make sure to **include screenshots showing 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 blackboard** 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'.
- You can access blackboard using the instructions at the bottom of the page.
- If for some reason you still cannot access blackboard. Send your .zip folder to the lab instructors by email.

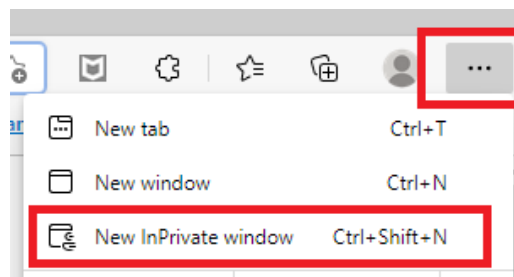
### Instructions on how to access to Blackboard.

**This is a temporary method of access to Blackboard to work-around access issues arising from the ongoing Security Incident**

1. Open a browser window in Incognito/InPrivate mode



**Chrome Incognito**





**Microsoft Edge InPrivate**

2. Go to <https://nuigalway.blackboard.com/>
3. Click the "Sign in with a third-party account" drop down and select the appropriate Blackboard SSO option. Staff select "Blackboard SSO Staff". Students select "Blackboard SSO Student"

A screenshot of the Blackboard Learn login page. The page features the 'Blackboard learn+' logo at the top. Below the logo are two input fields: 'USERNAME' and 'PASSWORD'. A 'Login' button is positioned below these fields. At the bottom of the page, a dropdown menu is highlighted with a red box. The dropdown is currently set to 'Sign in with a third-party account' and is open, showing two options: 'NUI Galway Staff' and 'NUI Galway Student', both preceded by small icon boxes.

4. You will be directed to the University Office365 login page. Enter your O365 login details and click “Next”. Staff: login using staffid@nuigalway.ie (e.g. 0123456s@nuigalway.ie)  
Students: login using your email address (e.g. [a.oconnor1@nuigalway.ie](mailto:a.oconnor1@nuigalway.ie))

 **NUI Galway**  
OÉ Gaillimh



## Sign in

0123456s@nuigalway.ie

[Can't access your account?](#)

[Back](#) [Next](#)

Staff: login using staffid@nuigalway.ie (e.g. 0123456s@nuigalway.ie) Students: login using your email address (e.g. a.oconnor1@nuigalway.ie)

5. Enter your password and click “Sign in”

## Enter password


.....

[Forgot my password](#)

[Sign in](#)

6. If your O365 account uses Multi Factor Authentication (MFA) you will be texted a code. Enter the code and click "Verify"

### Enter code

 We texted your phone +XXX XXXXXXXX04. Please enter the code to sign in.

☐ Don't ask again for 60 days

Having trouble? [Sign in another way](#)

[More information](#)

Verify

7. On the "Stay signed in" page click "Yes". You will then be logged into your Blackboard account

### Stay signed in?

Do this to reduce the number of times you are asked to sign in.

☐ Don't show this again

No

Yes