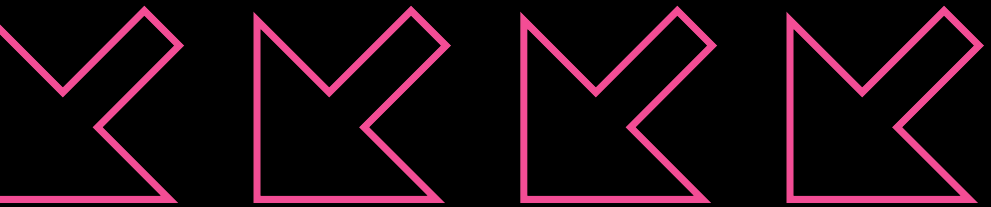
INTRO TO CODING CHALLENGE 2023

CODE FIRST GIRLS

THE CHALLENGE

SOLVE A SERIES OF CODING CONUNDRUMS USING FLOWCHARTS AND PSEUDOCODE

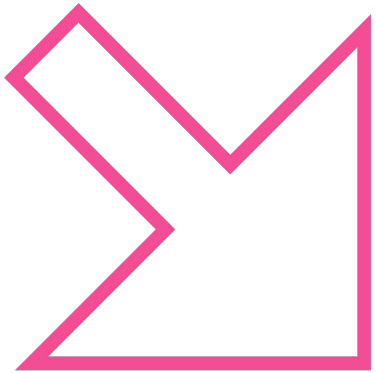


INTRODUCING: PYTHON CHALLENGE 2023

The Intro to Coding Challenge with Code First Girls is a 4-week challenge aiming to get participants to create Flowcharts and PseudoCode to represent the problems presented!

The Challenge

Each group will be presented with 5 coding problems. There will be 3 core problems and 2 additional problems. Students in teams will submit responses to 2 out of 5 questions for this challenge of their choosing. You can attempt more than 2 if time permits and will be getting additional points for doing so.



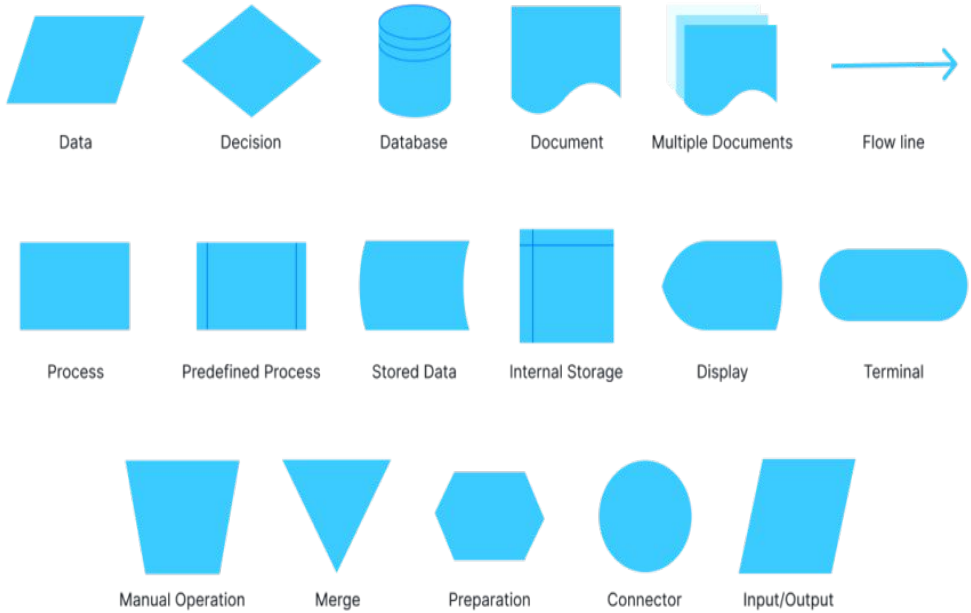
Introduction

The challenges are based on a topic discussed in our last session: *Flowcharts and PseudoCodes*.

They are one of the *simplest form* of representing a coding problem in a readable format that can be used as a blueprint to write actual code(using programming language's syntax).

We have seen some flowcharts earlier and the symbols used. In a world of flowcharts, they do have actual meanings as can be seen on the right or even on various websites, such as https://www.smartdraw.com/flowchart/flowchart-symbols.htm *OR* https://www.pipefy.com/blog/flowchart-symbols/.

Make use of these symbols to create flowcharts of problems given as challenges along with their pseudocodes.



CHALLENGE REQUIREMENTS

‘Must have’

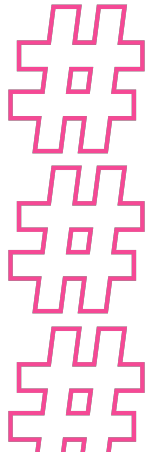
- A minimum of 2 challenge questions answered
- Consistent styling through the flowcharts.
- Simple and easy to understand pseudocode.
- Consistent colour coding for symbols as well as text.

‘Nice to have’

- Trying out more than 2 challenge questions.
- Following flowchart symbol convention.
- Consistent convention used for pseudocode.
- Following same colour coding for all the flowcharts and pseudocodes.

For flowcharts you can make use of either PowerPoint, Word, Paint or any website. There are quite a few available, such as -

- https://www.smartdraw.com/flowchart/flowchart-maker.htm
- https://app.diagrams.net/
- https://www.canva.com/graphs/flowcharts/



Challenge Problem #1 (Core)

Should we round up the final grade?

Every subject is graded from 0 to 100%. Less than 40% is failing grade and more than 80% is a distinction.

We can round up a grade:

- If the difference between the grade and the next multiple of 5 is less than 3, round up to the next multiple of 5.
- If the value of is less than 40, no rounding occurs as the result will still be a failing grade.

Given a input grade, round it up if appropriate and tell us if the student passed, failed or received a distinction. Write a algorithm and produce a flow chart.

Examples:

- round 93% to 95%, report distinction (95 - 93 < 3)
- do not round 38% , report fail (38<40)
- do not round 47%, report pass (50 - 47 = 3)

Challenge Problem #2 (Core)

Sorting an array.

You have an array of maximum size of 100 with DISTINCT integers. Write a algorithm and produce a flow chart that sorts this array from smallest to largest.

EXAMPLE:

[1, 4, 5, 66, 3, 84, 11, 198]

SORTED:

[1, 3, 4, 5, 11, 66, 84, 198]

Hint: There are a lot of ways how to do this!

Challenge Problem #3 (Core)

Search a number in a sorted matrix.

You are give a matrix (a list of lists) of DISTINCT integers and a target number. Each row in the matrix is SORTED and each column in the matrix is SORTED. Our matrix does not necessarily have the same height and width.

Write a pseudocode and produce a flowchart that:

1. Finds the number and report back its location (row and column indices of the target integer), if it is contained in the matrix
2. otherwise report back that the integer is not in the matrix.

EXAMPLE matrix:

matrix = [
[1,4,7,12,15,1000],
[2,5,19,31,32,1001],
[3,8,24,33,35,1002],
[40,41,42,**44**,45,1003],
[99,100,103,106,128,1004]
]

target = 44

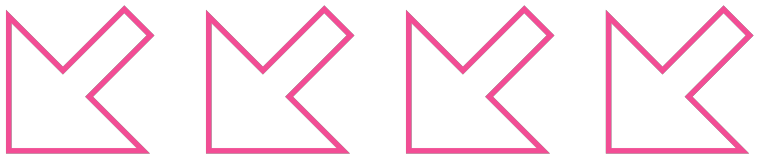
EXAMPLE result:

result = [3,3]

Note: Indexes start at 0

Integer 1 location is [0,0], integer 4 location is [0,1] and so on. The integers are reported as [row, column]

Note: There are clever ways how you can do this without always looking at all numbers one by one



Challenge Problem #4 (Additional)

Find factorial of n.

What are factorials: https://en.wikipedia.org/wiki/Factorial

The value of n will be small, less than 100. How could we use a lookup table to find the factorial not in the table already. If you would run the program, the first time the look up table would be empty.

Produce a pseudo code and a flowchart that allows us to find a factorial of a integer n.

EXAMPLE:

Factorial of 1 is 1! = 1.

Factorial of 2 is 2! = 1 * 2 = 2.

Factorial of 3 is 3!= 1 * 2 * 3 = 3 * 2! = 6

Factorial of 4 is 4!= 1 * 2 * 3 * 4 = 4 * 3! = 4 * 6

This gives us a general formula to find factorial: n! = n * (n-1)!

Challenge Problem #5 (Additional)

Hide the credit card digits.

There are 16 digits on a credit card. Every 4 digits are separated by a space. Start by generating a random credit card number.

For security reasons, you are going to hide the first 12 digits on the credit card.

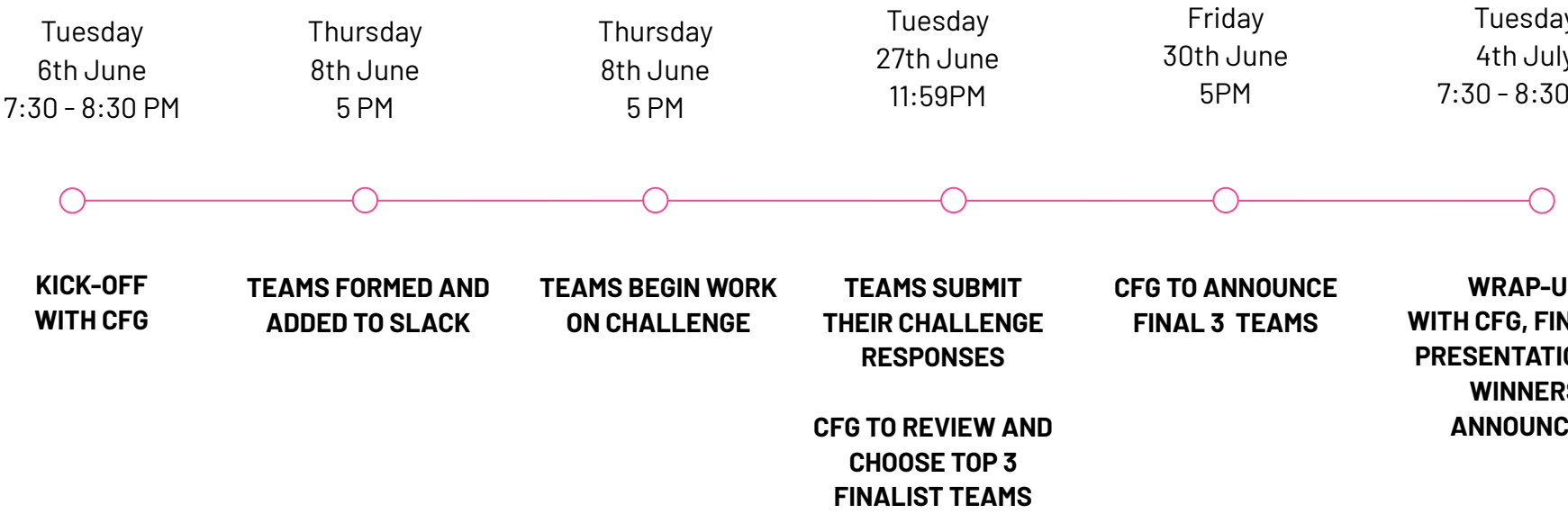
Example:

Randomly generated credit card number: 5486 3251 6584 7855

After hiding the first 12 digits, it would be: XXXX XXXX XXXX 7855

Produce a pseudo code and a flowchart.

CHALLENGE JOURNEY



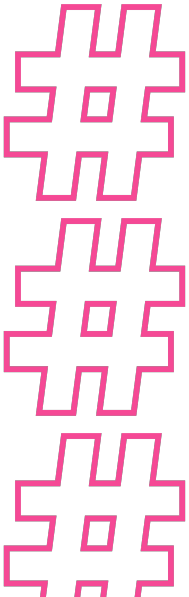
PROJECT TEAMS

+ Once you have confirmed your participation (via a short form that will be shared with you), you will be divided into teams and added to your team Slack channel. Project teams will have 4-6 members each.

+ Team members have been selected solely on the basis of their enthusiasm, motivation, tech knowledge and experience. Each team will be self-managing, with an expectation that roles and responsibilities will be fully shared.

+ You will be introduced to your project team on the Challenge Slack workspace. You will be working in this team throughout the Challenge, so once connected please do introduce yourselves to one another and start connecting, planning and building!

+ **Not all team members will be need to present at the Final Wrap Up Evening (if selected).** With this in mind, we suggest deciding early on who will be joining from your team and saving the date in your diaries:
+ For the Final Wrap Up Evening only TWO team members will be able to join StreamYard (our streaming platform) and the other team members can join via the YouTube livestream. More information will be shared later and StreamYard training provided prior to the Final Presentation Evening.



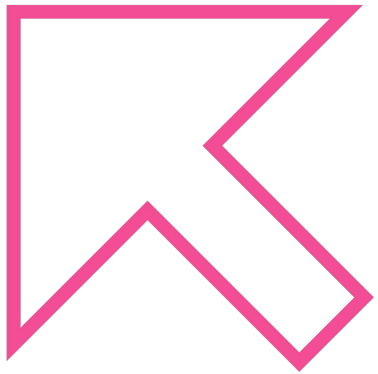
PROJECT DELIVERABLES & SUBMISSIONS

+ Your submission does not need to be 100% finished, but you must be able to demonstrate it via slide deck.

+ In the spirit of Challenges, only projects that were started on or after Thursday 8th June will be considered for judging. You can start sharing ideas within your team beforehand but not to start the projects until the 8th.

+ Submit your project by **11:59 PM Tuesday, 27th June** via the CFG submission form (link to be shared nearer the time). You will be asked to upload a slide deck (Microsoft PowerPoint presentation/PDF/Google Slides link with permission to view). The slide deck should answer the challenge questions and reflect on points mentioned in the judging criteria.

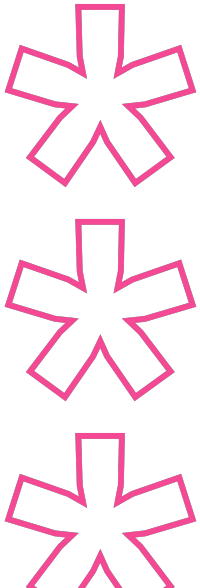
+ The final 3 teams will be decided by CFG after submitting and the 3 finalist teams will present at a live-streamed event on the 4th July, 7:30 - 8:30 PM, during which the winning team will be announced.



JUDGING CRITERIA

Teams will be judged on these criteria. During the final presentation evening, participants should try to describe what they did for each criterion to complete the Challenge. *For individual submissions, the collaboration criteria will be removed and the other criteria given equal weighting*

Criteria	Definition	Weighting
Innovation	Does the response take a fresh approach to the Challenge?	25%
Collaboration	Did the Challenge team collaborate on the Challenge? How did they demonstrate this?	25%
Presentation	How well has the Challenge response been presented?	25%
Adherence to Challenge theme	Did the team adhere to the Challenge?	25%

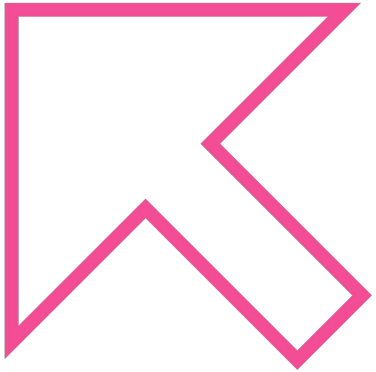


FINAL WRAP UP EVENING

+ The final 3 project teams will be decided after the submission deadline.

+ The finalist teams will present at a live-streamed event on Tuesday 4th July 7:30 - 8:30 PM, during which the winning team will be announced.

+The final three teams should prepare a brief (5-7 minutes) presentation on their Challenge responses, and be prepared to answer questions.



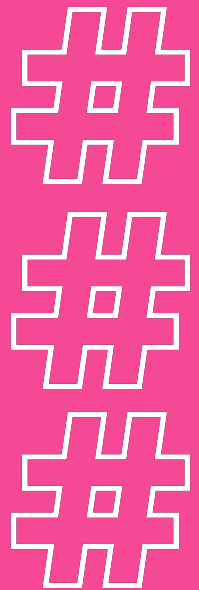
NEXT STEPS

+ **Submit this form** to confirm your participation in the Intro To Coding Challenge - **submit your registration via the form by 11:59 PM on Wednesday 7th June.**

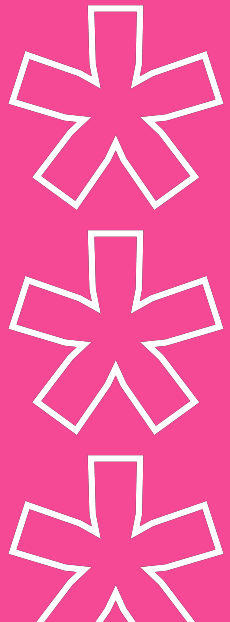
+ Accept the invitation to join the Slack workspace, if you haven't already joined.

+ Connect with your Team on the Challenge Slack workspace, start looking at and responding to the Challenge Statement!

+ We expect everyone taking part in a CFG event to abide by our Code of Conduct - please give it a read.



QUESTIONS




THANK YOU

GIVING WOMEN THE
UNFAIR ADVANTAGE