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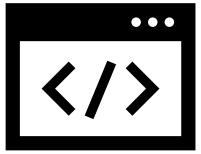

BIOE50010 – Programming 2

Computer Lab 1

Binghuan Li | *Department of Chemical Engineering*

binghuan.li19@imperial.ac.uk

October 12, 2023

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Top (do not) tips

From where we stopped last term…

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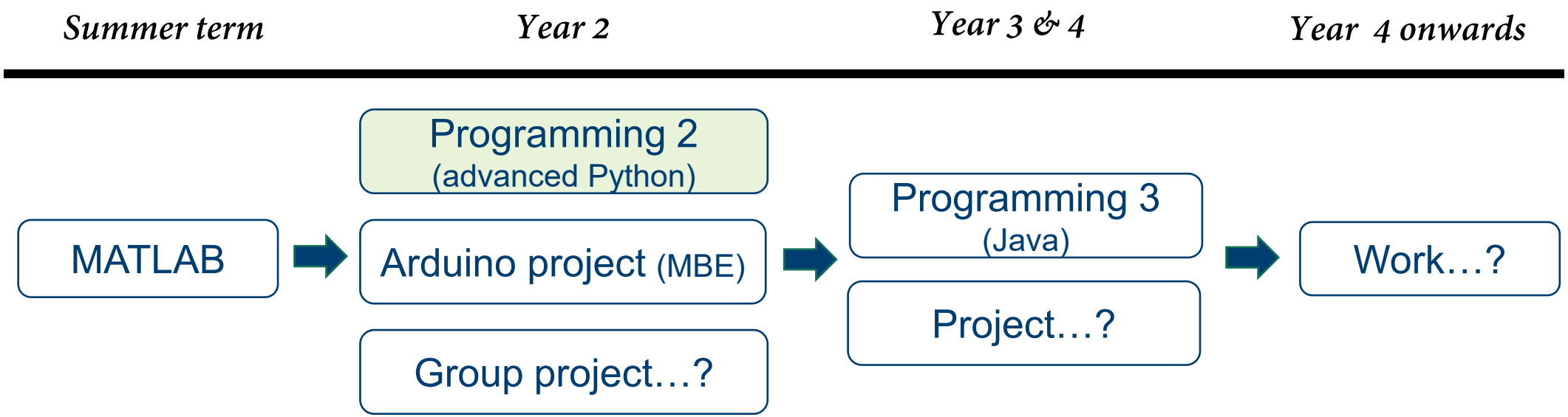
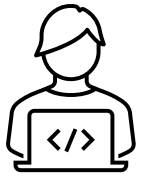
- An indictive timeline:



- *Thoughts? Expectations? Confidence?*

> *"There are only two kinds of languages: the ones people complain about and the ones nobody uses."*
>
> *- Bjarne Stroustrup*



About this session

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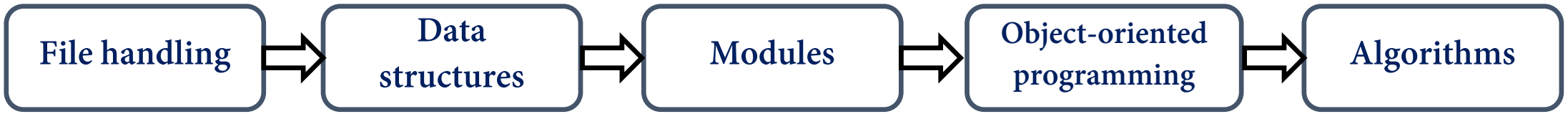
- *Weekly computer lab (2h×10) + lecture (2h ×9) + code clinics (1h ×8)*



- *Assessed by 2 timed assignments – will be communicated by the leader*

Q - What do you have?

- Access to your materials via Blackboard
- Lectures and recommended textbooks
- Online materials on Python
- us ☺

Q - What we expect you have known from Programming 1?

- Data types: `int`, `str`, `list`, `dict`, …
- Control flows: `if…elif…else`, `while`, `for`
- Functions and scopes

General tips to survive & thrive?

1) Syntax, syntax, syntax – that is everything
2) Don't rush – but please follow up…!
3) "why doesn't my code work?" won't help you solve the issue.
4) Use *Stack Overflow/chatGPT* wisely – how do you tell if a certain piece of code is good or not?
5) Working code is the best code.

"Premature optimization is the root of all evil."

✓ Correct syntax

```
for i in range (0,10):
    print(i)
```

✗ Syntax error: indentation

```
for i in range (0,10):
print(i)
```

```
for i in range (0,10):
    print("i equals to")
        print(i)
```

General tips to survive & thrive?

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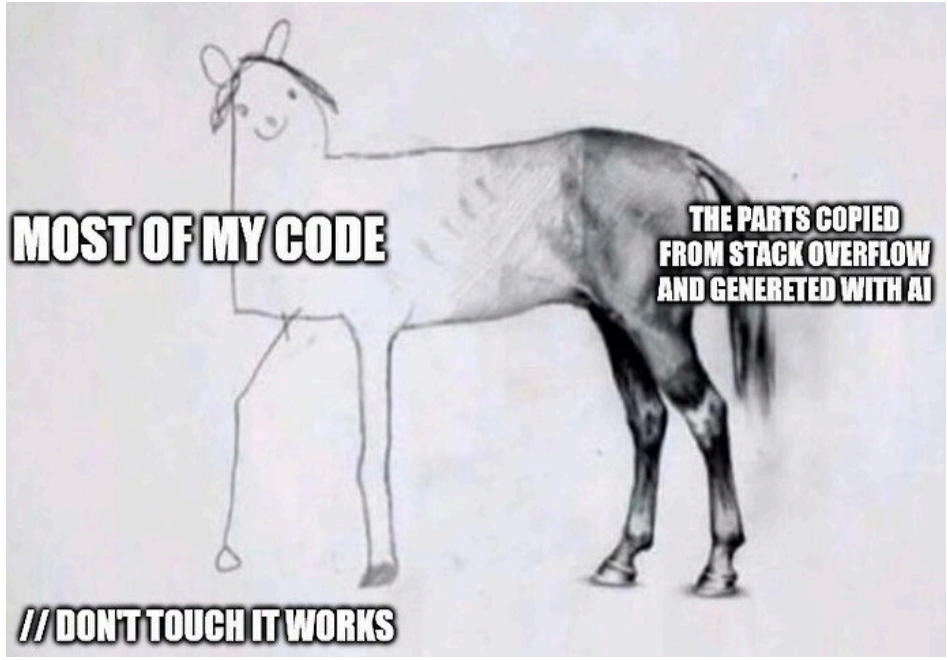
"Premature optimization is the root of all evil."



Modular Programming

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Modules (functions) are put together to make up the executable program.

- Functions are separately defined → reusable
- Functions are triggered serially in a main script

Example

```
import math


def pythagoras(a, b):
    c = math.sqrt(a**2 + b**2)
    return c

def main():
    a = 3
    b = 4
    c = pythagoras(a, b)
    print(c)

if __name__ == "__main__":
    main()
```

Import existed functions from the module `math`

Function definition for the Pythagorean theorem

Function definition to use the `pythagoras` function

Trigger the `main` function to execute

Revision Task - Tic Tac Toe

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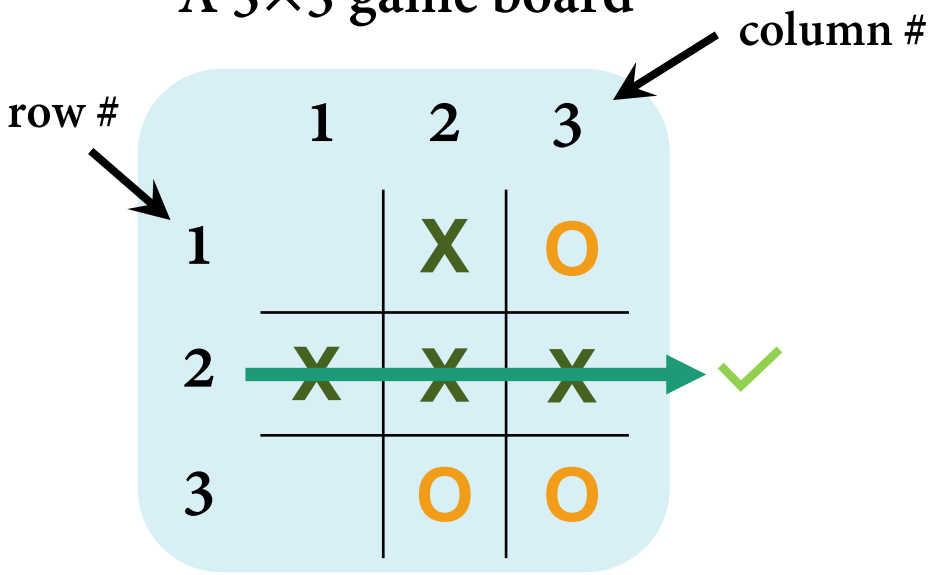
A 3×3 game board



2 players: X and O
play in turn

One possible walkthrough:

Step 1	*player X*	*row 2*	*col 2*
Step 2	*player O*	*row 1*	*col 3*
Step 3	*player X*	*row 1*	*col 2*
Step 4	*player O*	*row 3*	*col 2*
Step 5	*player X*	*row 2*	*col 1*
Step 6	*player O*	*row 3*	*col 3*
Step 7	*player X*	*row 2*	*col 3*

Game over, player X win !

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Revision Task - **Tic Tac Toe**

- A ***tie*** occurs when the board is full and neither player has won. For example,

	1	2	3
1	O	X	O
2	X	O	X
3	X	O	X

It is a tie!

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Your task today

Code a Python tic tac toe game in the *modular* programming fashion.

1. Consult the sample output
2. What functions do you need? Possible things you may reuse a lot –
   - Print a 3×3 board
   - Update the cells in the 3×3 board
   - Check if the termination condition reached: X/O win the game? Tie?
3. Will the game continue after the current round or game is over?
4. Error/exception handling: check user input – accept or reject?

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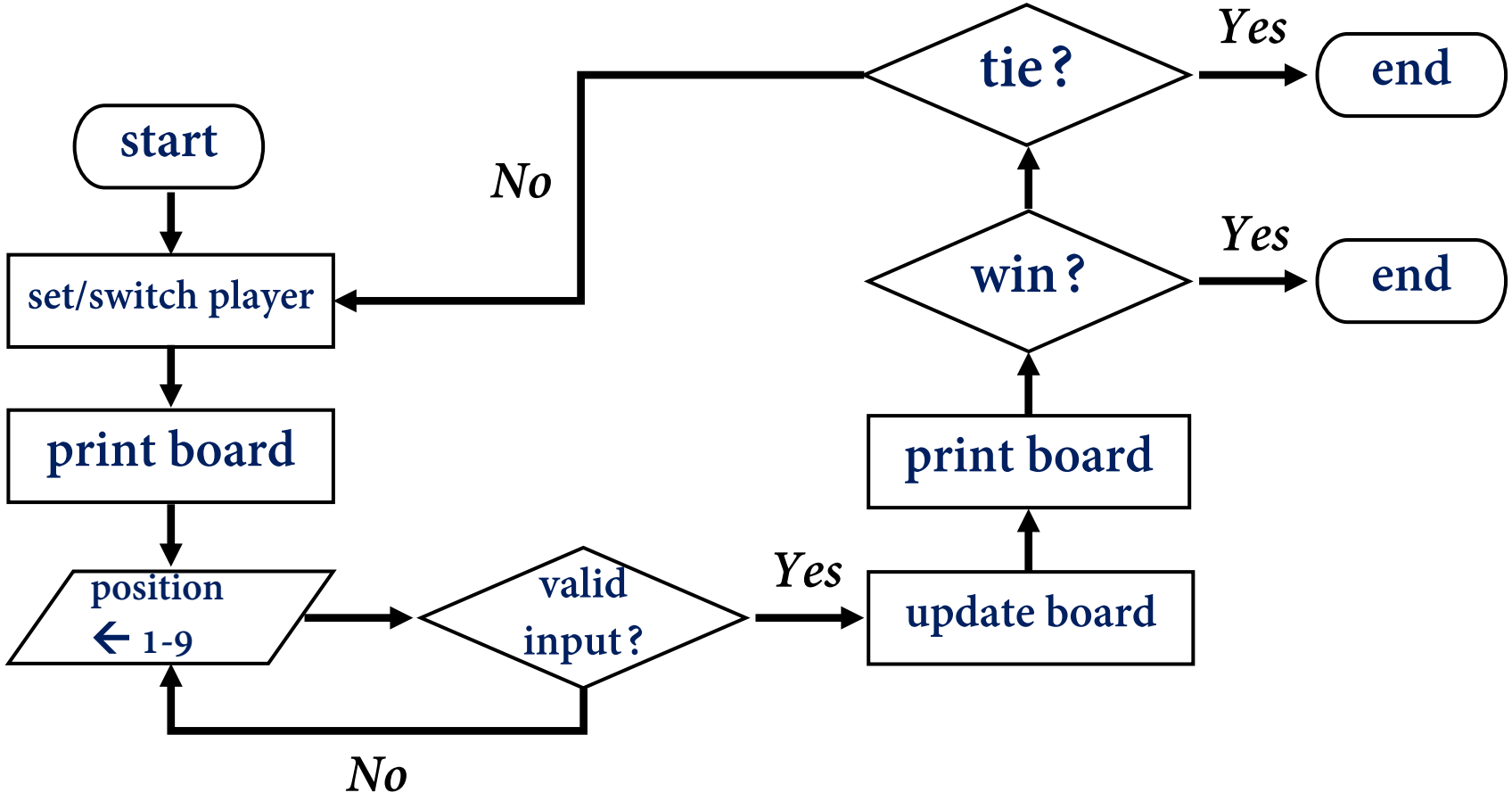
Questions?

That's it for now.

You can now proceed to the Lab 1 exercise.


start
set/switch player
print board
position ← 1-9
valid input?
No
Yes
update board
print board
win?
Yes
end
tie?
No
Yes
end