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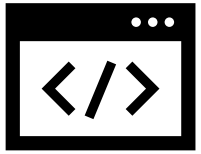

BIOE50010 – Programming 2

Computer Lab 3

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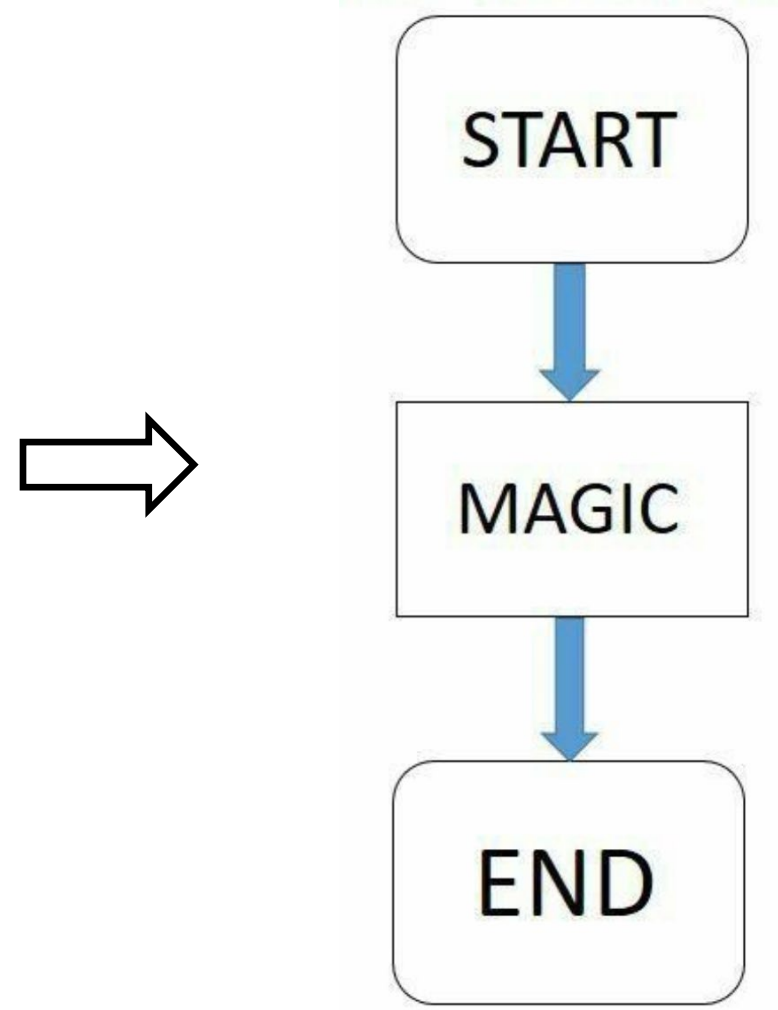
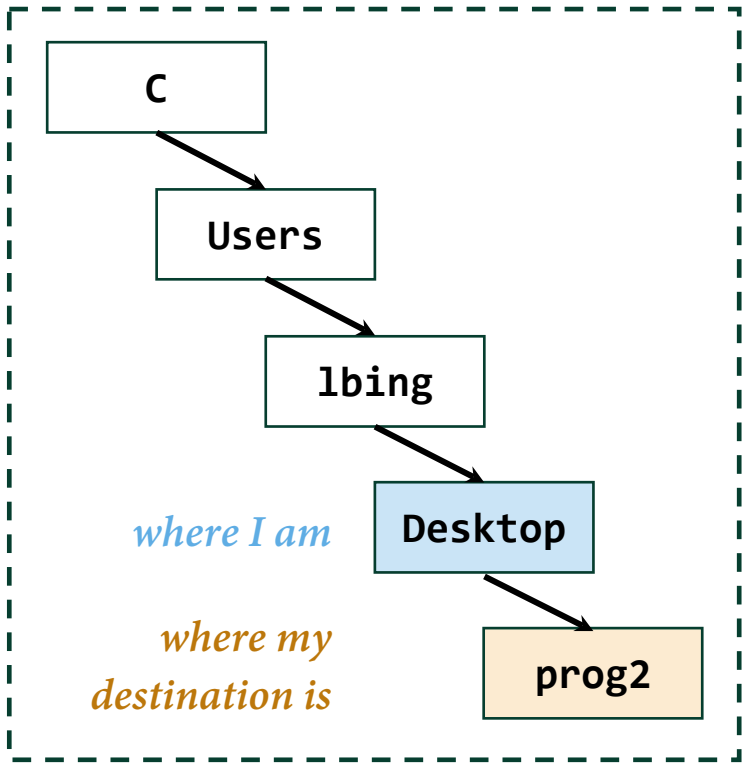
Meme of the week ☺

When asked to draw a flowchart of my code…



Source: https://cheezburger.com/13971461/programming-memes-for-frustrated-coders

Navigation



- Navigate using ***absolute*** path

```
cd  C:\Users\lbing\Desktop\prog2
```

absolute path in Windows

- Navigate using ***relative*** path

```
cd  .\prog2
```

my current dir (…\Desktop)

- From prog2 back to Desktop? (exit)

```
cd  ..
```

the parent dir

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Raw String

- Python treats the backslash (\) as a special (***escape***) character.

Example

```
myStr = 'Hi\nHello'
print(myStr)
```

Console

```
>> Hi
Hello
```

- Python **raw string** treats backslash (\) as a literal character.

Example

```
myStr = r'Hi\nHello'
print(myStr)
```

Console

```
>> Hi\nHello
```

- With an absolute path…

```
f = open(r'C:\Users\lbing\Desktop\lab2\the_road_not_taken.txt')
```

or

```
f = open('C:\\Users\\lbing\Desktop\\lab2\\the_road_not_taken.txt')
```

f-string formatting (again…)

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Code snippet from `extract_dna2protein.py`

```
data = [['T', 'T', 'T', 'Phe', 'F', 'Phenylalanine'],
        ['T', 'T', 'C', 'Phe', 'F', 'Phenylalanine']]

print(f'{data[0][0]}{data[0][1]}{data[0][2]}\t{data[0][3]}\t{data[0][4]}\t{data[0][5]}')
```

```
TTT   Phe   F Phenylalanine
```

- *Don't panic!*
- Starts with an **f** before the opening quotation mark
- Each individual variable is enclosed within a pair curly brackets **{}**

Example

```
name = 'Binghuan'
role = 'research PG'
print(f'name:\t{name}\nrole:\t{role}')
```

Console

```
name:   Binghuan
role:   research PG
```

Further reading on Python f-string formatting: https://realpython.com/python-f-strings/

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Shout your questions from Lab 2 !

***Your self-checklist**: have you encountered…*

- ***File I/O**: open, read, close*
- ***Loops** and **recursion**: when to terminate reading?*
- ***Function definition** and **namespaces***
- ***Formatting with f-string***
- ***Python build in functions:*** `count()`, `strip()`, `split()`

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Your tasks today (1/)

- 3 mini tasks on **Modular programming**
  - Task 1: Cartesian to radian conversion $\theta = (\tan^{-1}/\pi) * 180°$
  - Task 2: The Collatz conjecture
  - Task 3: plotting marks on a user-defined board
- Read the sample code and console output carefully
- Hint 1: using ***non-keyword arguments*** (`*arg`) to pass a non-fixed (variable) number of arguments to a function

Example

```
def good_fruits(*fruits):
    for item in fruits:
        print('let us take a', item)

good_fruits('kiwi', 'watermelon', 'durian')
```

Console

```
let us take a kiwi
let us take a watermelon
let us take a durian
```

Further reading on Python `arg` and `kwarg`: https://realpython.com/python-kwargs-and-args/

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Your tasks today (2/)

- Hint 2: two Python built-in functions for looping
  - **`range()`** - iterate through a sequence of numbers
  - **`enumerate()`** - iterate through a sequence *and* keep track of *both* the ***index*** and the *number*.

Example

```
good_friuts = ['kiwi', 'watermelon', 'durian']

# using range()
for idx in range(0, len(good_friuts)):
    print(f'{idx}\t{good_friuts[idx]}')

# using enumerate()
for idx, fruit in enumerate(good_friuts):
    print(f'{idx}\t{fruit}')
```

Same effects!

Console

```
0       kiwi
1       watermelon
2       durian
```

Further reading on Python **`range`** and **`enumerate`**: https://realpython.com/lessons/range-vs-enumerate/

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Questions?

That's it for now.

You may now proceed to the Lab 3 exercises.