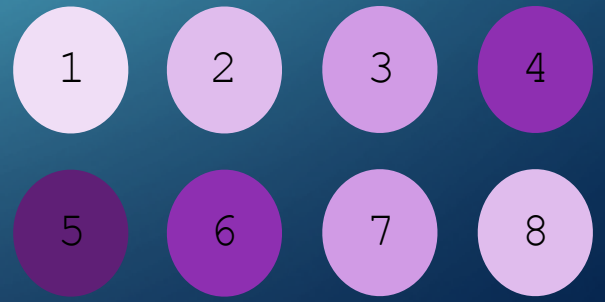
BEGINNERS' PYTHON - WEEK 2

LEWIS GAUL

ST EDMUND HALL

4TH YEAR MATHEMATICS

LEWIS.GAUL@SEH.OX.AC.UK



COURSE OUTLINE

- Installation & setup
- Introduction to data types
- Introduction to if statements and loops
- Using built-in functions, defining new functions and using them
- Using libraries – time, maths, GUI
- Introduction to classes
- Creating and using your own classes
- Steps to make a game

LEWIS.GAUL@SEH.OX.AC.UK

LIST INDEXING

- Create a list e.g. `my_list = [3, -4, 2, 0, 3, 9]`
- Indexing: `list[index]` e.g. `my_list[0]`, `my_list[-2]`
- Slicing: `list[start:end]` e.g. `my_list[1:3]`, `my_list[:-2]`, `my_list[:]` (copy the whole list)
- More complex slicing: `list[start:end:step]` e.g. `my_list[1::2]`, `my_list[::-1]` (reverse the list)

LEWIS.GAUL@SEH.OX.AC.UK

LIST OPERATIONS

Type help([function/object]) in the shell to see information about how to use the function/object, e.g. `help(range)`, `help(len)`, `help(list)`

- Addition, multiplication: `my_list+[1, 2]`, `3*my_list`
- Create a list with `range` e.g. `list(range(10))`, `list(range(1,10,2))`
- List functions: `len(my_list)`, `sorted(my_list)`
- List methods: `my_list.append('a')`, `my_list.insert(0, 35)`, `my_list.pop(2)`, `my_list.remove('a')`, `my_list.index(35)`

LEWIS.GAUL@SEH.OX.AC.UK

IF STATEMENTS

Remember the **colon** after the `if` statement, and that an **indent** always follows a colon. **Indentation** is essential in Python.

```
if [condition]:
   [do this]
elif [condition]:  (optional)
   [do this]
   [and this]
else:  (optional)
   [do this]


x = 1
```

```
if x > 0:
    print("Positive")
elif x == 0:
    print("Zero")
    x -= 1
else:
    print("Negative")
```

LEWIS.GAUL@SEH.OX.AC.UK

LOOPS

Use the `break` keyword to immediately stop the innermost loop.

```
while [condition]:
    [do this]
    if [condition]:
        break (optional)

for [variable] in [iterable]:
    [do this]
```

```
x = 1
while True: (infinite loop!)
    print(x)
    x += 1
    if x > 5:
        break

for i in [1, 2, "text!"]:
    print(i)
```

LEWIS.GAUL@SEH.OX.AC.UK

CHALLENGE 2

- Go to github.com/LewisGaul/python-tutorial, download `challenge2.py`
- Work out how the code works (try adding in some print statements)
- Write comments with '#' to explain how it works
- Can you think of any other (better?) ways to write it?
- When you understand it all, try to modify the code to achieve the challenge
- Try to use sensible variable names
- Avoid using too many indented layers or repeating code

LEWIS.GAUL@SEH.OX.AC.UK