Week 3 Tutorial

COMP10001 – Foundations of Computing

Semester 1, 2025

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- Python basics and types
- Variables and Strings
- Conditionals and Sequences

Revision, data types!

Type	Description
`int`	For whole numbers such as: -3, -5, or 10
`float`	For real numbers such as: -3.0, 0.5, or 3.14159
`bool`	The Boolean type. For storing `True` and `False` (only those two values; Booleans allow for no grey areas!).
`str` (= "string")	For chunks of text, eg: `"Hello, I study Python"`
`tuple`	For combinations of objects, eg: `(1, 2, 3)` or `(1.0, "hello", "frank")`
`list`	A more powerful way of storing lists of objects, eg: `[1, 3, 4]` or `[1.0, "hello", "frank"]`
`dict`	We will see this later ... maybe you can guess what it does eg: `{"bob": 34, "frankenstein": 203}`

Exercise 1, identify the different types of data

Type	Example	What does it store?	What can we do with it (functions, operations...)?	How do we convert to it?
	"Hello"			
	123			
	3.1415			
	True			

Exercise 2, Library Database

Attribute	Data Type
Name	
Late Fees Owed	
Whether they are a student	
Number of books loaned out	
User ID	

Exercise 3, evaluate by hand

`str(3 + 4) + "cakes"`	`float("357" + "." + "23")`
`int(5 / 2)`	`bool("anything")`

Exercise 4, evaluate by hand, given that **a = 1**, **b = 2**, **c = 2.0**

a / a	**b + b**	**b + c**	**a / b**
a // b	**a % b**	**a + b / c**	**(a + b) / c**

Exercise 5, evaluate by hand

123 + 123	"123" + "123"	"123" + 123
3 * 4	"3" * 4	"3" * "4"

Exercise 6, rounding error

We will be looking at some interesting stuff with decimals in programming:

- **rounding-error.py**
- **rounding-error-fix.py**

For those that are interested:

https://docs.python.org/3.6/tutorial/floatingpoint.html#tut-fp-is

Revision, Truth table

A	B	A and B	A or B	not A
T	T	T	T	F
T	F	F	T	F
F	T	F	T	T
F	F	F	F	T

Exercise 7, evaluate the following truth expressions

True or False	**False and not False or True**
True and False	**False and (not False or True)**

Exercise 8, give a value for *var*

For each of the following if statements, give an example of a value for *var* which will trigger it and one which will not.

Statement	Value for *var* that triggers	Value for *var* that does not trigger
`if 10 > var >= 5:`		
`if var[0] == "A" and var[-1] == "e":`		
`if var in ("VIC", "NSW", "ACT"):`		
`if var:`		

Exercise 9, what's wrong with my code?!

9. What's wrong with this code? How can you fix it?

```
eggs == 3
if eggs = 5:
    print("spam")
else:
    print("not spam")
```

Fix →

sem1-2025 > week-3 > exercise-9.py > ...

```
1    eggs = 3
2    if eggs == 5:
3        print("spam")
4    else:
5        print("not spam")
```

Exercise 10, what's wrong with my code?! (tricky)

10. What's wrong with this code? How can you fix it?

```
letter = input("Enter a letter: ")
if letter == 'a' or 'e' or 'i' or 'o' or 'u':
    print("vowel")
else:
    print("consonant")
```

Fix →

```
5   if letter == 'a' or letter == 'e' or letter == 'i' or letter == 'o' or letter == 'u':
6       print("vowel")
7   if letter in 'aeiou':
8       print("vowel")
9   if letter in ('a', 'e', 'i', 'o', 'u'):
10      print("vowel")
11  if letter in ['a', 'e', 'i', 'o', 'u']:
12      print("vowel")
```

Revision, String indexing!

index (+)						
letter	p	y	t	h	o	n
index (-)						

Exercise 11, evaluate the following given that **s =** "python"

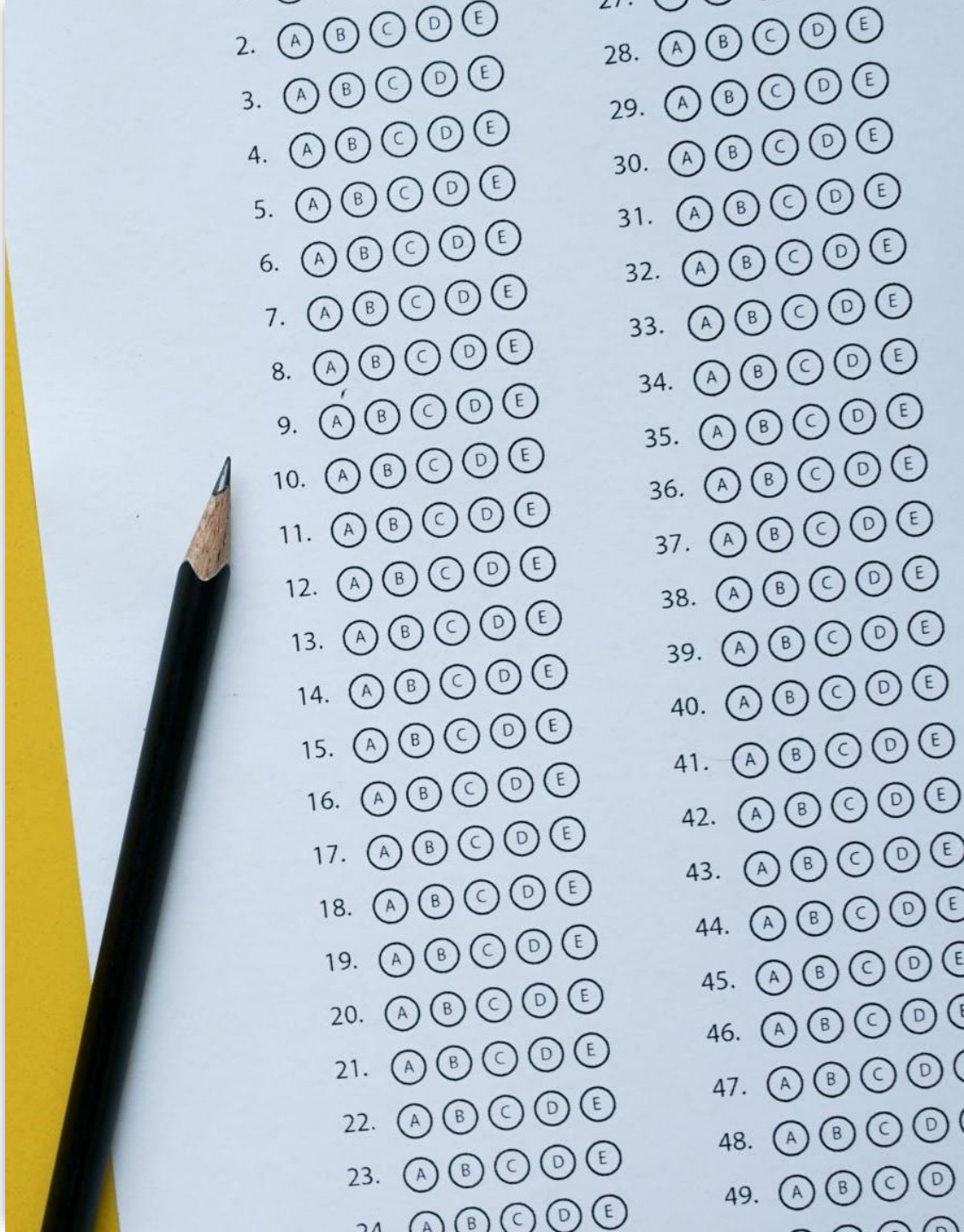
0 1 2 3 4 5 6

-6 –5 –4 –3 –2 –1

s[1]	**s[-1]**	**s[1:3] + s[3:5]**
s[10]	**s[10:]**	**s[-4:-2]**
s[:-4]	**s[::2]**	**s[::-1]**

Reminder: Mid Semester Test

- Will be held on **15 April** (Less than a month away!)
- Will be held during your **Tuesday** lecture time slot.
- You will be randomly allocated into one of 2 sessions:
  - 11am – 12pm
  - 12pm – 1pm
- One of the questions will include **writing code on paper.**
- Good to start practicing this now =)



Exercise 1/4

1. Write a program which asks the user for their age and calculates the year in which they were born. There will be two possibilities since you haven't taken their birth date, so print both. For example, your program should work similar to this when the user inputs `18`:

```
Enter your age: 18
You were born in either 2007 or 2006
```

Answer:

A:

```
age = int(input("Enter your age: "))
option_1 = 2025 - age
option_2 = option_1 - 1
print("You were born in either", option_1, "or", option_2)
```

Exercise 2/4

2. Write a program which asks the user for a temperature in degrees Fahrenheit and prints the corresponding value in Celsius. The conversion formula is below:

$$C = \frac{F - 32}{1.8}$$

This is an example of how the program could work when the user inputs `90`:

```
Enter the temperature in Fahrenheit: 90
90.0 Fahrenheit converts to 32.22222222222222 Celsius
```

Answer:

A:

```
f_degree = float(input("Enter the temperature in Fahrenheit: "))
c_degree = (f_degree - 32) / 1.8
print(f_degree, "Fahrenheit converts to", c_degree, "Celsius")
```

Exercise 3/4

3. Write a program which asks the user for a word, and prints a shortened version of their word consisting of its first three letters and then every second letter in the rest of the word. For example, when the user inputs the word `Honorificabilitudinitatibus`, the program might work like this:

```
Enter a word: Honorificabilitudinitatibus
Honrfcbltdnttbs
```

Answer:

A:

```
word = input("Enter a word: ")
short_word = word[:3] + word[4::2]
print(short_word)
```

Exercise 4/4

4. In this question you'll be writing a program that asks the user about the weather and prints snappy responses that depend on what the user has input. Feel free to be creative in the responses and try to come up with at least four (including one for an `else` branch)! Some examples of how your program could behave:

```
What's the weather like? rainy
Raining cats and dogs!
```

```
What's the weather like? typical Melbourne
Four seasons in one day!
```

Answer:

A: *Your program will have different responses to this, but should have a similar structure.*

```
weather = input("What's the weather like? ")
if weather == "rainy":
    print("Raining cats and dogs!")
elif weather == "sunny":
    print("Cool sunglasses!")
elif weather == "typical Melbourne":
    print("Four seasons in one day!")
else:
    print("What?!")
```

Independent work

- **Worksheets 1 and 2 due today at 6pm!!!**
- **Do worksheets 3, 4, 5** on Ed (due **next Monday at 6pm**)
  - Remember that **Ed worksheets contributes to 10% of your total score!**
- **Raise your hand** if you have any questions!

Scan here for annotated slides