2807/7001ICT Programming Principles (I), Trimester 3, 2019
Workshop 4

School of Information and Communication Technology
Griffith University

October 28, 2019

Module	2
When	Day 4
Goals	In this workshop we create interactive scripts that make decisions and/or loop.
Marks	5
Due	Pre-workshop questions at the start of the workshop; problems by the *beginning* of the next workshop.

1 Preparation

Before your workshop class:

- Read all of this document.
- Review the lecture notes sections 1 to 13.
- Bring some paper (a print-out of this document is best) and writing implements.
- Bring a storage device, such as a portable hard drive and cable, or a USB drive.

2 Pre-workshop questions (1 mark)

Complete these questions in writing *before* the start of the workshop. They will be marked early in the workshop.

1. Which Python type would be appropriate for:

   (a) the number of cars in a company fleet? _____

   (b) the registration number (e.g. `111AAA`) of a particular car? _____

   (c) does a particular car have an automatic transmission? _____

   (d) a car's year of manufacture? _____

   (e) a car's engine displacement in litres? _____

   (f) was a car manufactured in the last 3 years? _____

2. What are the names of these characters?

   (a) , _____

   (b) ; _____

(c) : _____

(d) (_____

(e) } _____

3. Complete this table, if the following statements have already been executed.

```
i = 7
j = 2
x = 2.2
```

expression	*type*	*value*
`i`	`int`	`7`
`i < 10`		
`i < j`		
`i % 2`		
`j % 2`		
`i % 2 == 0`		
`j % 2 == 0`		
`i % 2 == j % 2`		
`'x * x'`		
`x * x < 2 * x`		
`i % 2 == 0 or j % 2 == 0`		
`i % 2 == 0 and j % 2 == 0`		

3 Workshop activities

3.1 Marking last workshop's problems

If you have problems that still need marking from the previous workshop, get them marked at the *start* of this one.

3.2 Problem 1 (1 mark)

Problem: A small concert theatre for chamber music has seating for 100 guests. Write a program that the box office can use to make sure only 100 seats are sold. It should look like this when run.

```
Seats remaining: 100. How many in your group? 40
Booked, thank you.
Seats remaining: 60. How many in your group? 39
Booked, thank you.
Seats remaining: 21.How many in your group? 20
Booked, thank you.
Seats remaining: 1. How many in your group? 5
Sorry, not enough seats left.
Seats remaining: 1. How many in your group? 1
Booked, thank you.
SOLD OUT!
```

3.3 Problem 2 (1 mark)

Problem: Write a program that demonstrates exponential growth. Ask the user how many lines to print, then print lines of hashes, starting with one hash, then doubling the number of hashes on each subsequent line. Example:

```
How many lines? 7
#
##
####
########
################
################################
################################################################
```

3.4 Problem 3 (1 mark)

Problem: Write a program that prints a triangle of hashes like these examples:

```
How many lines? 3
  #
 ###
#####
```

```
How many lines? 10
         #
        ###
       #####
      #######
     #########
    ###########
   #############
  ###############
 #################
###################
```

3.5 Problem 4 (1 mark)

This problem might be a little harder. Hint: do you need a loop?

Problem: A rugby team has 15 players. A bus company has big buses that can carry 48 passengers and small buses that can carry 10 passengers. Big buses cost $200.00 to hire. Small buses cost $95.00 to hire. Write a program that the tournament organiser can use to calculate the number of big and small that should be hired to minimise the total cost. Examples:

```
How many teams? 1
Hire 0 big buses and 2 small buses.
Cost = $190.0
```

```
How many teams? 2
Hire 1 big buses and 0 small buses.
Cost = $200.0
```

```
How many teams? 3
Hire 1 big buses and 0 small buses.
Cost = $200.0
```

```
How many teams? 4
Hire 1 big buses and 2 small buses.
Cost = $390.0
```

```
How many teams? 10
Hire 3 big buses and 1 small buses.
Cost = $695.0
```

4 After the workshop

- You have created programs that might be useful to refer back to in future workshops. Make sure that you will have that work in the future. One copy is not enough for at IT professional. You should have at least 2 copies:

  1. on your Griffith network storage drive; and
  2. on your portable storage device.