

## CSC1015F Assignment 1: Console Input/Output and Control (if)

### Assignment Instructions

This assignment involves constructing Python programs that use input and output statements, 'if' and 'if-else' control flow statements, and statements that perform numerical manipulation.

You may need to use additional attributes of the print statement that control what is printed at the end of each print statement (`end="\n"`) and separating each value in a list of values (`sep=" "`). For example:

```
print ("a","b","c")
```

displays "a b c"

```
print ("a","b","c", sep="|")
```

displays "a|b|c"

### Question 1 [30 marks]

ASCII Art is a technique to create fancy effects using simple text output.

By using only print statements, write a program called 'rabbit.py' that outputs the following:

(	\	\														(	\	/	)									
(		'	'	)				(	\	_	/	)				(	.	.	)				/	/	)			
○	(	"	)	(	"	)		(	\	'	.	'	/	)		(	"	)	(	"	)	○		(	"	)		
								(	"	)	_	(	"	)										(	)	(	)	○

Do not include the blue guides - these are there simply so you can see how many spaces are between characters.

Here's the raw text for further reference:

```
(\ \                (\ /)
(  ' ' )          (\ _ /)      ( . . )      //)
o (" ) (" )      (\ ' . ' /)  (" ) (" ) o  (" )
              (" ) _ (" )              ( ) ( ) o
```

Some of the backslashes (\) may need to be escaped (written as \\ instead). Search online to find out why this is necessary.

## Question 2 [35 marks]

Write a program called `time.py` for checking the validity of a time entered by the user as a set of three integers. In professional software, it is never assumed that input from users is valid so you too need to do this in your programs.

In this case, you want to check if the hours is between 0 and 23 (inclusive), the minutes is between 0 and 59 (inclusive) and the seconds is between 0 and 59 (inclusive).

Three samples of program behaviour:

1)

```
Enter the hours: 21
Enter the minutes: 7
Enter the seconds: 7
Your time is valid.
```

2)

```
Enter the hours: 25
Enter the minutes: -7
Enter the seconds: 0
Your time is invalid.
```

3)

```
Enter the hours: 21
Enter the minutes: 7
Enter the seconds: 72
Your time is invalid.
```

## Question 3 [35 marks]

Given sides of length  $a$ ,  $b$ ,  $c$ , the area of a triangle may be calculated as follows (Heron's formula):

$$s = (a + b + c) / 2$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

Write a program called `triangle.py` that asks the user to enter the lengths of the three sides of a triangle, and that calculates and prints the area.

Sample IO:

```
Enter the length of the first side: 3
Enter the length of the second side: 4
Enter the length of the third side: 5
The area of the triangle with sides of length 3 and 4 and 5 is 6.0.
```

HINT: Say you wanted to find the square root of 121 - how would you go about this? In Python (and many other languages), there are built-in functions that can perform such calculations for you. The function to find a square root is `math.sqrt` ('sqrt' in the 'math' library).

### Submission

Create and submit a Zip file called 'ABCXYZ123.zip' (where ABCXYZ123 is YOUR student number) containing `rabbit.py`, `time.py` and `triangle.py`.