PAL Consolidation 3 *University of Hertfordshire – Week 5 – November 2015 –*

1 Aim & Objectives

- Re-cap and review difficult test questions
- Questions & Answers on previous sheet
- Work through lecture related exercises

2 Introduction

In this session we'll be looking at procedural programming in more detail, which includes the idea of looking at "sub-routines", also well known as functions.

3 Exercise - Simple example

The first exercise will involve creating a really pointless program that just highlights how functions work. Create a program that carries out the below task:

```
DISPLAY "Print before function"
DISPLAY "Hello from function" -- Call this
DISPLAY from another method
DISPLAY "Print after function"
```

The following is a clue on how to do this:

```
def func():
    # Do something here
    # Remember the function returns after the
indentation finishes!

# Call function
func()
```

Remember that indentation is extremely important here!

You got it right if your code looks similar to this:

```
# Our function here is not run till called!
def func():
    print("Hello from function")

# Code runs from here
print("Print before function")
# Call our function
func()
print("Print after function")
```

4 Exercise - Pass me that...

Now we're going to give our functions some value - literally in this case. The function you'll write will be simple and will add will find the long side of a right angle triangle! The equation is $\sqrt{a^2 + b^2} = c$ and in Python this looks like '`c = math.sqrt((a * a) + (b * b))`'. Don't forget to '`import math`' to use the math class.

Your code should have a function called '`missingSide`' and should take two parameters, '`a`' and '`b`'. Search on the internet "*python 3 parameters to function*" for help on how to add arguments to your function.

To test it works, find the value of '`a = 3`', '`b = 4`' - the value should be an integer and not have any numbers after the decimal point.

Your answer should look something like this:

```
import math

def missingSide():
    return = math.sqrt((a * a) + (b * b))

print("Length of missing side is",
missingSide(3, 4))
```

5 Exercise - Experiments & Research

So, you're getting the hang of these function things eh? What happens when we start mixing this up a little? Try out the following experiments:

- What happens if you're function calls itself?

  "Infinite" loop.
- Find out what it's called when a function calls itself.

  Recursion. Recursion.
- Research how many times a function can call itself. Can you check this with a small bit of code?

  Apparently Python can handle up to a 1000 frames without being artificially changed.

6 Resources & Further Reading

'*http://homepages.herts.ac.uk/~db12aba/*' – All content from these sessions updated weekly.

'*http://code.org/*' – A good resource testing your programming skills.

'*http://stackoverflow.com/*' – Highly recommended online help for programmers (NOTE: Employers are interested to know whether you're an active member of this site!).

'*http://www.draw.io*' – A very good, free online drawing tool that exports to many formats, including '`XML`' and '`JPG`'.