Curtin University
DEPARTMENT OF MATHEMATICS & STATISTICS

**ACCELERATED MATHEMATICS UNITS MATH1017 AND MATH1021**

# Lab Sheet 3

Let's have a review. Today, we want you to put examples together of each of:

(i) **if** statement.

(ii) **for** statement.

(iii) **while** statement.

(iv) **repeat** statement.

You should also ensure that last week's exercise is complete. So that will be an example of **proc**.

For the **if** statement, start with

```
x := rand(1 .. 6)();  #emulates the roll of a die
if x = 1 then
  .
  .
```

Be creative. Get the **if** to do something for at least 4 different $x$ values, and make sure you have a **elif** and **else** clause, and run the code enough times to see it execute each possible branch.

For your **for** example use:

```
prod := 1;
for i from 1 to 5 do
  prod := prod * i;
od;
```

Rewrite this using **while**. What you need to remember is the *loop* variable (which is $i$ in this case), needs to be initialised before the loop and stepped in the last statement of the loop.

Rewrite your **for** again using your **repeat** emulation. To get the effect of:

```
repeat
  ⟨statement-sequence⟩
until ⟨condition⟩
```

in Maple do:

```
do
  ⟨statement-sequence⟩
  if ⟨condition⟩ then
     break
  fi
od;
```

And, as mentioned above finish last week's exercise, so that you have an `if` in a `proc`.

If you are finished and want something to do, create a `proc` to sum 11 terms of the Maclaurin series for $e^x$:

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots + \frac{x^{10}}{10!} \cdots$$

This will give you a headstart for next week.