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# **Design while loops**

## **COMP 102**

**Victoria University of Wellington**

# Designing loops

Is the number of steps determined at the beginning?

```
int i = 0;
```

```
while ( i < number ) {
```

```
    <do actions >
```

```
    i = i + 1;
```

```
}
```

```
int i = 1;
```

```
while ( i <= number ) {
```

```
    <do actions >
```

```
    i++;
```

```
}
```

- Note, can count from 0 or from 1!

Otherwise

```
<initialise >
```

```
while ( <condition-to-do it again > ) {
```

```
    <body >
```

```
    <increment >
```

```
}
```

# Designing loops

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Does exiting the loop depend on the actions?

if so

*set up for the test*

**while** ( *test* ) {

*do actions*

*set up for the next test*

}

or

**while** ( true ) {

*set up for the test*

**if** ( *exit-test* ) {

**break**;

}

*do actions*

}

# Designing loops

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- Write out the steps for a couple of iterations
  - including the tests to determine when to quit/keep going
- Identify the section that is repeated
  - preferably starting with the test
- Wrap it with a **while** ( ) { }
- Identify the condition for repeating (and initial state).

# More loops with user input – magic word

- Make user guess a magic word:
  - prompt user for a word
  - test if it is “pumpkin” => stop
  - if not
    - say no!
    - prompt user for a word
    - test if it is “pumpkin” => stop
  - if not
    - say no!
    - prompt user for a word
    - test if it is “pumpkin” => stop
  - if not
    - say no!
    - prompt user for a word
    - test if it is “pumpkin” => stop

# More loops with user input – magic word

- Make user guess a magic word:
  - prompt user for a word
  - test if it is “pumpkin”
  - if not, try again

```
UI.print("Please enter the magic word:");
```

```
String answer = UI.askString("your guess: ");
```

```
if ( answer.equalsIgnoreCase("pumpkin") ) { ...
```

```
    if not, go back           where to??
```

```
at end
```

```
UI.println("You finally guessed it!");
```

# Magic word 1: break to exit

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- Put “while” at the beginning of the repeated section
- Use the “infinite loop” and an `if ( ) { break; }`

```
while ( true ) {  
    UI.print(“Please enter the magic word:”);  
  
    String answer = UI.askString(“your guess: ”);  
    if ( answer.equalsIgnoreCase(“pumpkin”) ) {  
        break;  
    }  
    UI.print(“No!”);  
}  
  
UI.println(“You finally guessed it!”);
```

# Magic word 2: unfold

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- Put “while” where the test is,
- Repeat the “set up” in the body.

```
UI.print("Please enter the magic word:");  
String answer = UI.askString("your guess: ");  
while ( ! answer.equalsIgnoreCase("pumpkin") ) {  
    UI.println("No!");  
    answer = UI.askString("your guess: ");  
}  
UI.println("You finally guessed it!");
```



# Magic word 3: clever initialisation

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- Set up a “dummy” case first.

```
UI.print("Please enter the magic word:");  
String answer = "not pumpkin!";  
while ( ! answer.equalsIgnoreCase("pumpkin") ) {  
    answer = UI.askString("your guess: ");  
}  
UI.println("You finally guessed it!");
```