While loop
COMP 102

Victoria University of Wellington

Repetition / Iteration

Doing some action repeatedly:

- "Vacuum the floor until it is clean"

- "leave the pizza in the own until the cheese is golden"

- "walk until you reach the shop on the left side of the road"

- "Keep stirring until the sugar is fully dissolved in the hot water"
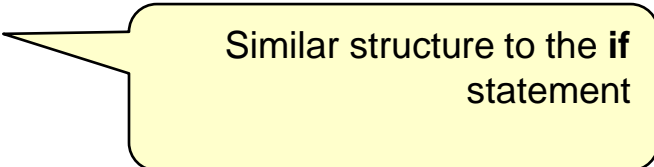
Common features:
- An action to repeat
- Some condition for when to keep going/when to stop

Repetion/Iteration in Java   LDC 4.5

- Several different ways of specifying repetition.

- One of the simplest is with the **while** statement:

while (*condition-to-do-it-again* **) {**

    actions to perform each time round

}

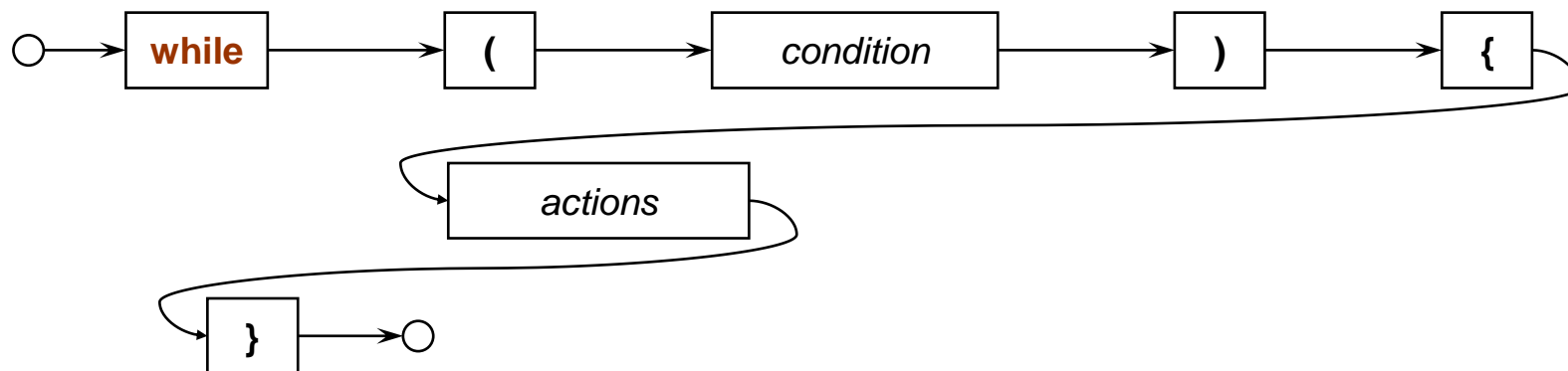> Similar structure to the **if** statement

---

while (true) {

    UI.println("this repeats forever!");

}

---

int n = 1;
while (n <= 100) {
    UI.println(n) ;
    n = n + 1;
}

While statement

Diagram: while → (→ condition →) → { → actions → }

- ## Meaning:

  Repeatedly

  - If the condition is still true, do the actions another time
  - If the condition is false, stop and go on to the next statement.
    - Note: don't do actions at all if the condition is initially false

- ## Similar to **if**, but NOT THE SAME!

  - keeps repeating the actions,
    - as long as the condition is still true each time round
  - no **else** — just skips to next statement when condition is false

While with numbers #1

- Print a table of numbers and their squares:

```
public void printSquares(int max){
    int num = 1;
    while ( num <= max ) {
        UI.printf(" %3d    %6d   %n",  num,  (num*num));
        num = num + 1;
    }
}
```

- Repetition generally involves
  - initialisation: get ready for the loop
  - test: whether to repeat
  - body: what to repeat
  - change: get ready for the next iteration

While with numbers #1

- Draw a line of rectangles:

```
public void drawRectangles (int count){
    int size = 30;
    int num = 0;
    while ( num < count ) {
        UI.drawRect(left+num*size, top, size, size));
        num = num + 1;
    }
}
```

While with numbers #2

- Counting down:

```
public void countDown(int start){
    int count = start;
    while ( count >= 1) {
        UI.println( count );
        count = count – 1;
    }
    UI.println(" GO");
}


    :
this.countDown(5);
    :
```

While with Strings

/** Read words from user, and combine into sentence */

```
public void readSentence(){
    String sentence = "";
    int count = 0;
    while ( ! sentence.endsWith(".") ) {
        String word = UI.askString("Next word: ");
        sentence = sentence + " " + word;
        count = count + 1;
    }
    UI.println(sentence + " has " + count + " words");
}
```