The while Statement

- A while statement has the following syntax:

```c
while ( condition )
    statement;
```

- If the condition is true, the statement is executed
- Then the condition is evaluated again, and if it is still true, the statement is executed again
- The statement is executed repeatedly until the condition becomes false

Logic of a while Loop

![Logic of a while Loop Diagram](image-url)
The while Statement

```java
int count = 1;
while (count <= 3)
{
    System.out.println (count);
    count++;
}
```

If the condition of a `while` loop is false initially, the statement is never executed

```java
int count = 8;
while (count <= 3)
{
    System.out.println (count);
    count++;
}
```

- Therefore, the body of a `while` loop will execute zero or more times
Example: Input validation

```java
System.out.println("type in a number >5");
int num = scan.nextInt();
while (num <= 5) {
    System.out.println ("Please try again");
    System.out.println ("type a number >5");
    num = scan.nextInt();
}
```

• In this example, the body of the `while` loop will typically execute zero times

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Let’s try this with the `Wages.java` program

```java
import java.text.NumberFormat;
import java.util.Scanner;
public class Wages {
    public static void main(String[] args) {
        double pay = 0.0;
        final double RATE = 8.25;  // regular pay rate
        final int STANDARD = 40;  // standard hours in a work week
        Scanner scan = new Scanner(System.in);
        double pay = 0.0;
        continue
    }
}
```
```java
continue

System.out.print("Enter the number of hours worked: ");
int hours = scan.nextInt();

System.out.println();

// Pay overtime at "time and a half"
if (hours > STANDARD)
   pay = STANDARD * RATE + (hours-STANDARD) * (RATE * 1.5);
else
   pay = hours * RATE;

NumberFormat fmt = NumberFormat.getCurrencyInstance();
System.out.println("Gross earnings: " + fmt.format(pay));
```

What if we want to do a calculation over and over again?

- Example: Keep calculating the Wages until user quits program (infinite loop).
- Example: Keep calculating Wages and ask each time whether to keep going.
- Example: Keep calculating Wages until user inputs zero for the hours
GPA problem: Algorithm for next solution

```
more = true;

while (more)
{
    input qp
    input credits
    qpa = qp/credits
    print qpa

    print "Enter 1 to continue, 0 to quit "
    input answer
    more = (1 == answer)
}
```

GPA problem: next solution

```
int qp;
int credits;
double gpa;
Scanner scan = new Scanner(System.in);

boolean more = true;

while (more)
{
    // get input
    System.out.print ("Enter Quality Points > ");
    qp = scan.nextInt();

    System.out.print ("Enter Credits > ");
    credits = scan.nextInt();

    // other logic goes here...

    System.out.print ("Enter 1 to continue, 0 to quit > ");
    more = (1 == scan.nextInt());
}
```

**Homework:** Read Section 5.4
Always do all self-review exercises when you review material
This time it is particularly important!
Do Exercises EX 5.7 – 5.11