

Iteration

The **while** and **for** loops

Iteration

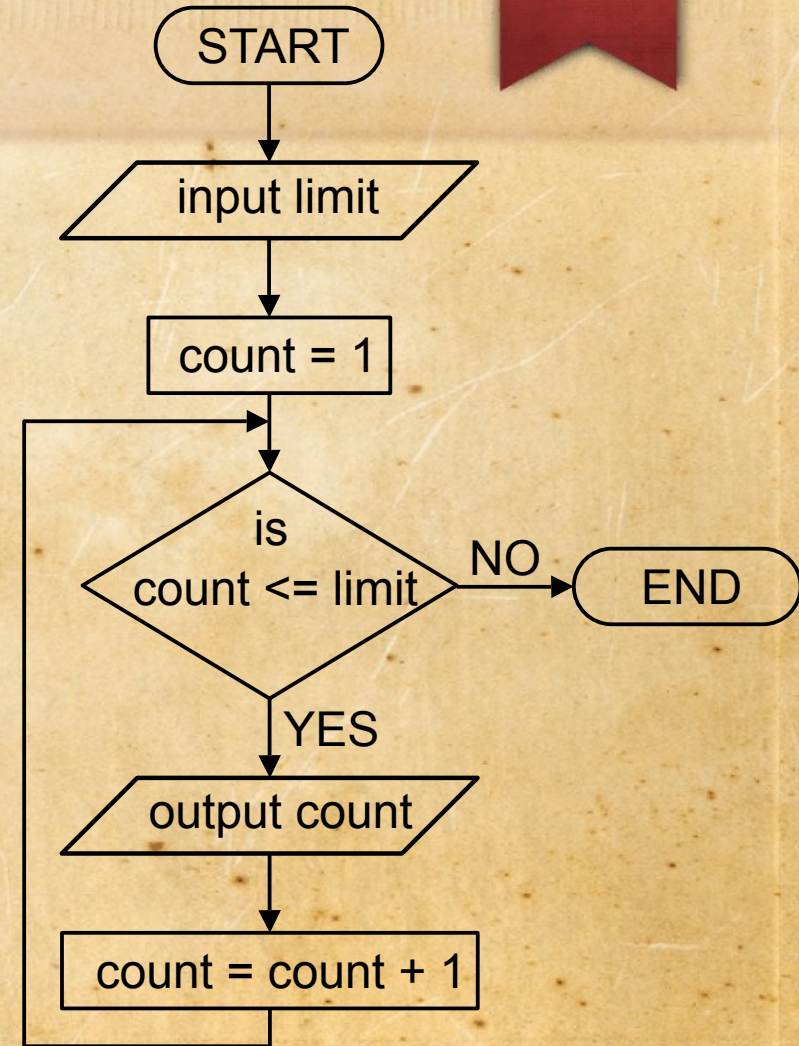
- AP Exam Weighting: **17.5% - 22.5%**
 - The `while` statement
 - The `for` statement

while loop

- The algorithm represented in the flowchart can be converted into the following Java code:

```
public static void count(int limit) {  
    int count = 1;  
    while(count <= limit) {  
        System.out.println(count);  
        count += 1;  
    }  
}
```

Subprocess: count



while loop

- Adding a main process and executing the Java code gives us the following output:

```
public static void main(String[] args) {  
    count(5);  
}
```

```
public static void count(int limit) {  
    int count = 1;  
    while(count <= limit) {  
        System.out.println(count);  
        count += 1;  
    }  
}
```

```
1  
2  
3  
4  
5
```

The for Statement

```
public static void countTo(int max) {  
    for(int i=1; i<=max; i++) {  
        System.out.print(i + " ");  
    }  
    System.out.println();  
}
```

```
int i = 1;  
while(i<=max) {  
    System.out.print(i + " ");  
    i++;  
}
```

The for Statement

```
public static void main(String[] args) {  
    countTo(10);  
}  
public static void countTo(int max) {  
    for(int i=1; i<=max; i++) {  
        System.out.print(i + " ");  
    }  
    System.out.println();  
}
```

1 2 3 4 5 6 7 8 9 10

Practice

- Write a method
 - That repeatedly prints a character a variable number of times

```
public static void main(String[] args) {  
    printCharRepeatedly('a',5);  
}  
public static void printCharRepeatedly(char c, int numTimes) {  
    //TODO: Write the code for this method.  
}
```

aaaaaa

Practice

- Write a method
 - That repeatedly prints a character in a grid of size x,y

```
public static void main(String[] args) {  
    printCharGrid('b',10,4);  
}  
public static void printCharGrid(char c, int x, int y) {  
    //TODO: Write the code for this method.  
}
```

```
bbbbbbbbbbb  
bbbbbbbbbbb  
bbbbbbbbbbb  
bbbbbbbbbbb
```

Practice

- Write a method

- That repeatedly prints a character a variable number of times

```
public static void printCharRepeatedly(char c, int numTimes) {}
```

- That repeatedly prints a character in a grid of size x,y

```
public static void printCharGrid(char c, int x, int y) {}
```

```
int i=1;  
while(i<=max) {  
    System.out.print(i + " ");  
    i++;  
}  
System.out.println();
```

```
for(int i=1; i<=max; i++) {  
    System.out.print(i + " ");  
}  
System.out.println();
```

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The **while** and **for** loops