

CT60A2411

Loops: Week 3A



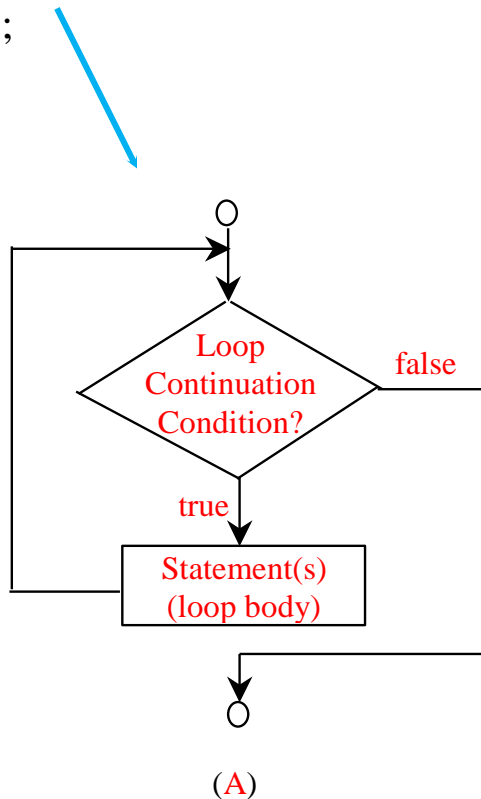
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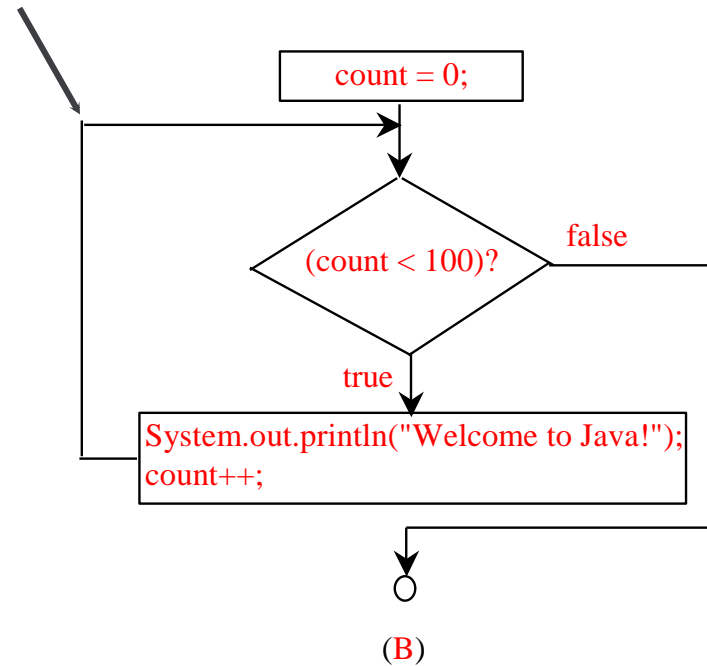
Loops

- To execute a block of code for certain number of times
- while loop
- do ... while loop
- for loop

```
while (loop-continuation-condition) {  
    // loop-body;  
    Statement(s);  
}
```



```
int count = 0;  
while (count < 100) {  
    System.out.println("Welcome to Java!");  
    count++;  
}
```

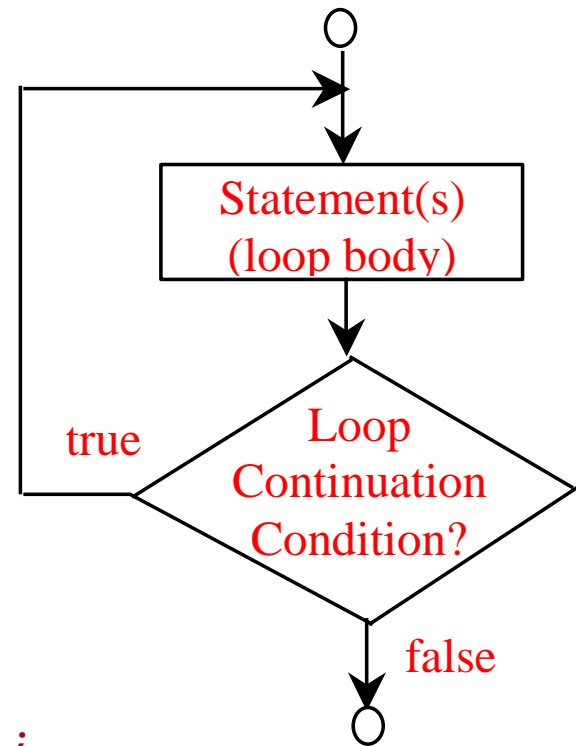




- do.. while loop

```
do {  
    // Loop body;  
    Statement(s);  
} while (loop-continuation-condition);
```

```
int count = 0;  
do {  
    System.out.println("Welcome to Java!");  
    count++;  
}  
while (count < 100);
```



- So, what is the difference between **while** and **do – while** loops ?

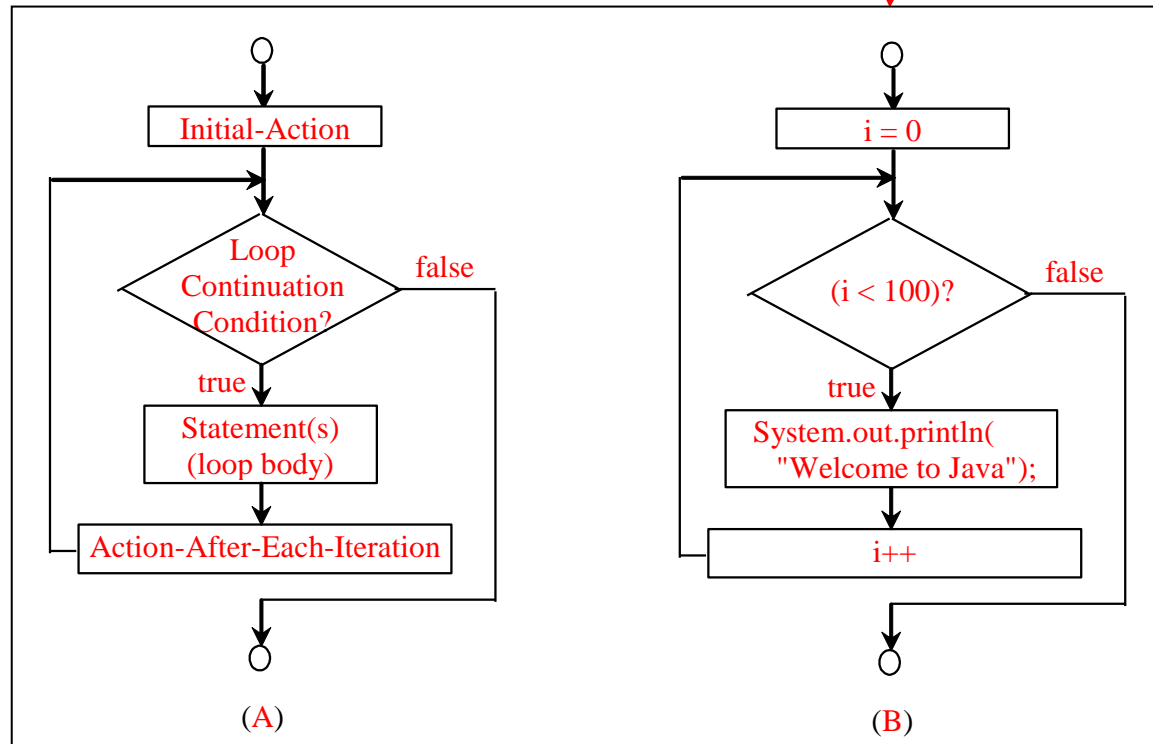




○ for loop

```
for (initial-action; loop-continuation-condition; action-after-each-iteration) {  
    // loop body;  
    Statement(s);  
}
```

```
for (int i = 0; i < 100; i++) {  
    System.out.println(  
        "Welcome to Java!");  
}
```



```
Ex1_week4.py
1 print ("Miles\tKilometers")
2 for i in range(1,11):
3     print(i,"\t",(i*1.609))
4

Shell
Python 3.7.9 (bundled)
>>> %cd 'Z:\Python 2021_Fall\Fall
>>> %Run Ex1_week4.py

Miles    Kilometers
1         1.609
2         3.218
3         4.827
4         6.436
5         8.045
6         9.654
7        11.263
8        12.872
9        14.481
10       16.09
```

```
public static void main(String[] args) {

System.out.println("Miles\tKilometers");
for (int i =1; i<11;i++) { // for loop
System.out.println(i+"\t"+i*1.609);
}

int j = 1; // while loop
System.out.println("Miles\tKilometers");
while (j<11) {
System.out.println(j+"\t"+j*1.609);
j++;
}

int k = 1; // do while loop
System.out.println("Miles\tKilometers");
do {
System.out.println(k+"\t"+k*1.609);
k++;
}
while(k<11);
}
```

- So, which one should we use?



○ Nested loops (self-study)

Use a nested loop to print the following pattern:

```
Ex4_week4.py x
1 x = 7
2 for i in range(7):
3     x = x - 1
4     j = x
5     while j >= 1:
6         print(j, end=" ")
7         j = j - 1
8     print("\n")
```

```
Shell x
Python 3.7.9 (bundled)
>>> %Run Ex4_week4.py
6 5 4 3 2 1
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
```

```
public static void main(String[] args)
{
    int x = 7;
    for (int i = 1; i < 7; i++) {
        x = --x;
        int j = x;
        while (j >= 1) {
            System.out.print(j);
            j--;
        }
        System.out.printf("\n");
    }
}
```



○ **Identify and fix errors in the code below:**



```
public class Test {  
    public static void main(string[] args)    {  
        for (int i = 0; i < 10; i++);  
        {  
            if (j > i) then  
                j++  
            else  
                j--;  
            }  
        }  
    }  
}
```





- What will be the output of the program below?

```
public class Test {  
    public static void main(String[] args) {  
        int i = 1;  
        while (i <= 4) {  
            int num = 1;  
            for (int j = 1; j <= i; j++) {  
                System.out.print(num + "bb");  
                num *= 3;  
            }  
            System.out.println();  
            i++;  
        }  
    }  
}
```

