

Programming Fundamentals Lecture 8

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Lecture Objectives

- Learn what is “for statement”.
- Learn what is “do While statement.”

Sentinels

In computer programming, data values used to signal the start or end of a data series are called sentinels.

```
while (grade <= HIGHGRADE)
{
total = total + grade;
cout << "Enter a grade: ";
cin >> grade;
}
```

break and **continue** Statements

A **break** statement, as its name implies, forces an immediate break, or exit, from the switch, while, for, and do-while statements

Example

```
while (count <= 10)
{
    cout << "Enter a number: ";
    cin >> num;
    if (num > 76)
    {
        cout << "You lose!\n";
        break; // break out of the loop
    }
    else
    {
        cout << "Keep on trucking!\n";
        count++;
    }
    // break jumps to here
}
```

break and continue Statements

The **continue** statement is similar to the break statement but applies only to loops created with while, do-while, and for statements. This is the general format of a continue statement:

continue;

Example

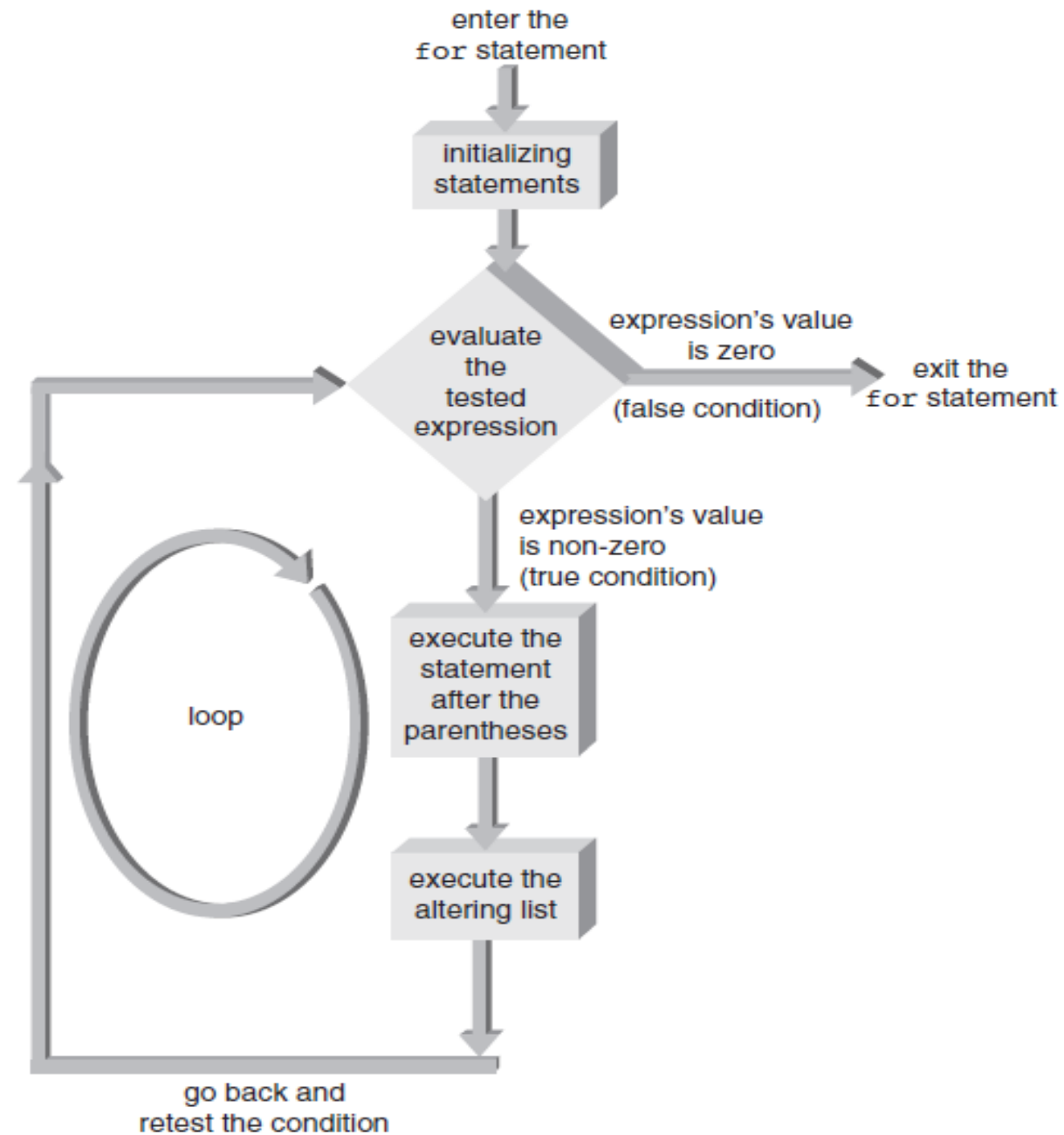
```
while (count < 30)
{
    cout << "Enter a grade: ";
    cin >> grade
    if(grade < 0 || grade > 100)
        continue;
    total = total + grade;
    count++;
}
```

for Loops

**for (initializing list; relational expression; altering list)
statement;**

for Loops

A for loop flowchart:



Example

```
for (count = 1; count < 10; count = count + 1)  
cout << count;
```

```
for (i = 5; i <= 15; i = i + 2)  
cout << i;
```

Example

```
int main() {  
    const int MAXCOUNT = 5;  
    int count;  
    cout << "NUMBER SQUARE  
ROOT\n";  
    cout << "-----\n";  
    cout <<  
setiosflags ios::showpoint);  
    for (count = 1; count <=
```

```
MAXCOUNT; count++)  
    cout << setw(4) << count  
    << setw(12) <<  
sqrt(double(count)) << endl;  
    return 0;  
}
```

Example

```
int main()
{
int count;
count = 2; // initializer outside
the for loop
for ( ; count <= 20; )
{
cout << count << " ";
```

```
count = count + 2; //
altering statement
}
return 0;
}
```

Example

```
int main() // all expressions inside for's parentheses
{
int count;
for (count = 2; count <= 20; cout << count << " ", count = count + 2);
return 0;
}
```

Null
statement



Example

```
for (count = 2; ; count = count + 1)  
cout << count;
```



Omitted
condition
We can use
break and
continue
statements

Example

$$y = 10x^2 + 3x - 2$$

Find the y value when the x value is : 1, 2, 3, 4, 5, and 6

Not3: arrnge the value of x and y as table.

Example

```
double x, y;  
cout << "x value y value\n"  
<< "-----\n";  
cout << setiosflags(ios::fixed)  
<< setiosflags(ios::showpoint)  
<< setprecision(5);  
for (x = 2.0; x <= 6.0; x = x + 0.5)  
{
```

```
y = 10 * pow(x,2.0) + 3.0 * x - 2.0;  
cout << setw(4) << x << setw(11)  
<< y << endl;  
}
```


Example

Write a program to calculate $[Z = y^x]$.

Example

Write a Program to read a character and find if it's in alphabet, digit or a special character.

Example

Write a program to find the equation $Z=x*y$ without using $*$ operation.

Example

Write a program to print out the following shape:

```
1  2  3  4
5  6  7
8  9
10
```

Example

Write a program to print out the following shape:

```
1  2  3  4
3  4  5
5  6
7
```

Example

Write a program to print out the following shape:

```
*  
**  
***  
****  
*****
```

Example

Write a program to print out the following shape:

```
  *  
 ***  
*****
```

Example

Write a program to print each digit in a given number.

Example

Write a program to convert a decimal number (n) to binary.

Example

Write a program to calculate $\sum_{i=1}^5 \frac{x!}{y!}$

Example

Write a program to print the capital letters from (A → Z).

Example

Write a program to calculate

➤ $s = 1! + 2! + 3! + \dots + n!$

➤ $s = x^1 + x^2 + x^3 + \dots + x^n$

➤ $s = \frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + \dots + \frac{n}{n!}$

➤ $s = \frac{1}{n!} + \frac{2}{(n-1)!} + \frac{3}{(n-2)!} + \dots + \frac{n}{1!}$

➤ $s = \frac{x}{1} + \frac{x}{2} + \frac{x}{3} + \dots + \frac{x}{n}$

THANK YOU FOR LISTENING

