

Computer Science & Engineering 150A

Problem Solving Using Computers – Laboratory

Lecture 09 - Loop

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Announcement: CodeLab assignment

CSCE150A

Assignment

while
operators
for
do-while

- The 4rd CodeLab assignment

Due: 23:59, Mar 21

```
while ( condition )
```

```
{
```

```
    executable1;
```

```
    ...
```

```
    change variable in conditional statement
```

```
}
```

- Condition: any boolean value or expression
- Test condition. If it's true: execute loop body, repeats; false: skipped.
- Must make a change in conditional variable within the loop to avoid infinite loop.
- Get program to stop: "CTRL+C"

- Compound assignment operators

- $x = x + 1;$ $\langle == \rangle$ $x += 1;$
- $y = y - 15;$ $\langle == \rangle$ $y -= 15;$
- $\text{count} = \text{count} * 3;$ $\langle == \rangle$ $\text{count} *= 3 ;$
- $k = k / 3;$ $\langle == \rangle$ $k /= 3 ;$
- $z = z \% 3;$ $\langle == \rangle$ $z \% = 3;$

- Increment and decrement operators

- $x = x + 1;$ $\langle == \rangle$ $x++$ (or $++x$);
- $y = y - 1;$ $\langle == \rangle$ $y--$ (or $--y$);

- Repetition: for a fixed number of times

```
int x;  
for ( x = 0; x < maxValue; x++)  
{  
    executable1;  
    ...  
}
```

- Should NOT make a change in conditional variable!

for loop: example

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- Example: Sum of 1,2,3,... 100

```
int x, sum=0;
for ( x = 1; x <= 100; x++ )
    sum += x;
```

- Counter initialized
- Condition is tested and loop repeated if condition holds
- Counter is incremented (or decremented)

OR

```
int x, sum=0;
for ( x = 100; x >= 1; x-- )
    sum += x;
```

do while loop

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- Repetition: At least once

```
do
{
    executable1;
    ...
    change variable in conditional statement;
} while ( check condition );
```

- Similar to while loop
- Execute loop body at least once
- Don't miss ";"

do while loop: example

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- Example:

```
int num;  
do  
{  
    printf("Input a positive integer number:");  
    scanf("%d", &num);  
} while(num<=0);
```

- Loop is entered the first cycle
- Condition is tested after each loop is completed
- Loop is repeated as long as condition holds
- Conditional variable changed, otherwise, infinite loop

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Assignment

while

operators

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do-while

```
while ( condition )
```

```
{
```

```
    code...
```

```
}
```

```
do
```

```
{
```

```
    code...
```

```
} while ( condition );
```

```
for ( i = 0; i < n; i++ )
```

```
{
```

```
    code...
```

```
}
```