

CONFIDENTIAL

C Programming Introduction

Week 8: Loops

Dept of Software Engineering
Hanoi University of
Technology

For HEDSPI Project

Topic of this week

- Loops
 - Class Lecture Review
 - The While,do Repetition Structure
 - Notes and Observations
 - Continue and break
 - Programming Exercises

The While,do Repetition Structure

- While Statement

- The expression is evaluated. If it is *true*, statement is executed and expression is reevaluated. This cycle continues until expression becomes *false*.

```
while (expression) {  
    Statement1;  
    Statement2;  
    ...  
}
```

The While,do Repetition Structure

- Example of While

```
#include <stdio.h>  
#define PERIOD '.'  
main() {  
    char C;  
    while ((C = getchar()) != PERIOD)  
        putchar(C);  
    printf("Good Bye.\n");  
}
```

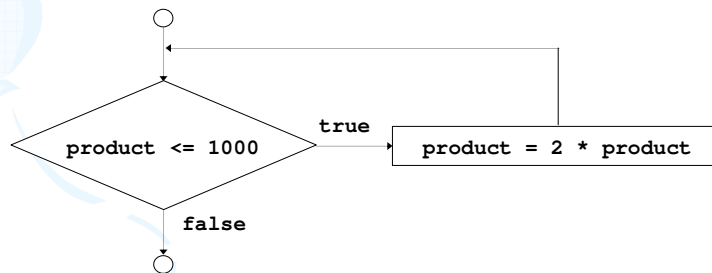


Result?

The While,do Repetition Structure

- Example:

```
int product = 2;  
while ( product <= 1000 )  
    product = 2 * product;
```



The While,do Repetition Structure

- Do-While Statement

- The do-while, tests at the bottom after making each pass through the loop body; the body is always executed at least once.

```
do {  
    statement1;  
    statement2;  
    ...  
} while (expression);
```

The While,do Repetition Structure

- Example of **Do-While**

```
int i = 1, sum = 0;
do {
    sum += i;
    i++;
} while (i <= 50);
printf("The sum of 1 to 50 is %d\n", sum);
```



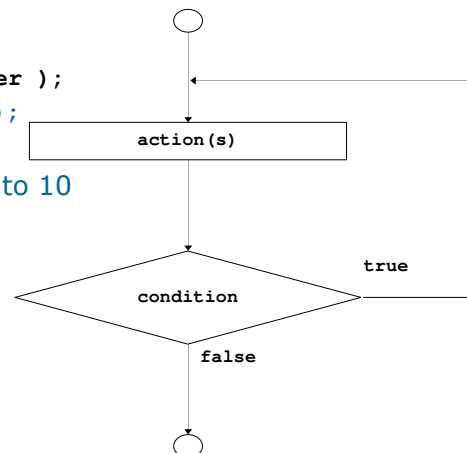
Result?

The While,do Repetition Structure

- Example (letting counter = 1)

```
do {
    printf( "%d ", counter );
} while (++counter <= 10);
```

Prints the integers from 1 to 10





Continue and Break

- **Break and Continue Statement**

- The **break** statement provides an early **exit** from for, while, and do.

```
break;
```

- The **continue** statement is related to break, but less often used; it causes the **next iteration** of the enclosing for, while, or do loop to **begin**.

```
continue;
```



Continue and Break

- **Example of Break and Continue**

```
int c;
while ((c = getchar()) != -1) {
    if (C == '.')
        break;
    else if (c >= '0' && c <= '9')
        continue;
    else putchar(c);
}
printf("*** Good Bye ***\n");
```



Exercise 8.1

- Write a program that copies content inputed from the keyboard to the screen, but replace the sequence of blank characters by only one blank character.
- You can use `getchar()` and `putchar()` method to carry out this program.



Exercise 8.2

- Write a program that replaces characters such as: `tab, \t, \b` by `\\` character in the input string and print out.
- You can use `getchar()` method to carry out this program.
- You can use *if* structure or *switch* structure.

Three balloons (green, blue, and purple) with yellow streamers are positioned on the left side of the slide.

Exercise 8.3

- Calculate square cube by using newton method.

Three balloons (green, blue, and purple) with yellow streamers are positioned on the left side of the slide.

Exercise 8.4

- How to compute the payroll for a company?
- Write and compile the program below to see how you can use while statement to do this task.



Exercise 8.5

- Write a program that use *while* structure to analysis of examination results: how many passed students and failed students.
- You can simply ask user to show that a student is passed or failed by entering a presented number: 1 is passed and 2 is failed.



Exercise 8.6

- Use do...while statement to print out integers that is smaller than a preceded number.
- Note that the do...while statement always performs one time at least.



Exercise 8.7

- We would like a program to average a set of grades.
- Algorithm notes:
 - We need a running sum of grades, and a running count of how many grades have been read so far.
 - We need to read until we get a sentinel value | let's use a negative grade to indicate we are done.
 - Need to be sure we print prompts.



Exercise 8.8

- Write a program that compute $n!$ using a loop.
- You can use:
 - Counter" variable, i , ranging from 1 to n .
 - Running product f , tracking $i!$.