CONFIDENTIAL

C Programming Introduction

Week 8:Loops

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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

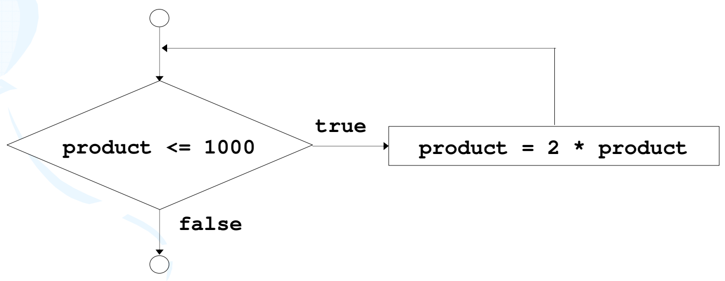
```
#include <stdio.h>
#define PERIOD '.'
main() {
   char C;
   while ((C = getchar())!= PERIOD)
      putchar(C);
   printf("Good Bye.\n");
}
```

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);
```

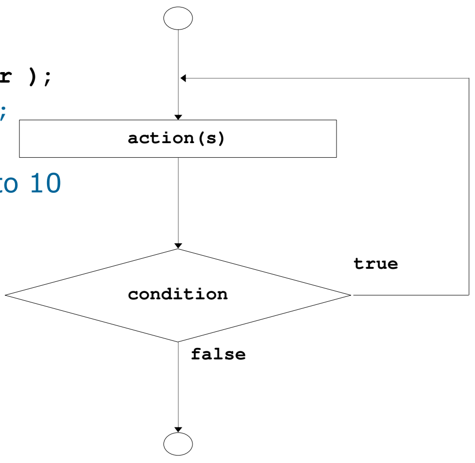
Result?

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.

Exercise 8.3

- Calculate square cube by using newton method.

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!.