

Module 17: do-while loops

Intro to Computer Science 1 - C++
Professor Scott Frees

Textbook

This topic is covered in section 5.3

Motivation...

Write a loop that keeps asking the user to enter a number until they enter -1.

Pre-test vs. Post-test

- A while loop is a **pre-test** loop:
 - Before executing any statements within the loop, the boolean expression is checked.
- Often, we will want to execute **at least** once...
 - Execute the statements, *then* test to see if we should repeat...

```
do {  
    statements...  
} while ( boolean expression ) ;
```

- Always executes at least 1 **iteration**.

Programming Example 18

Ask the user to enter a series of numbers

- They can stop by entering “-1”
- Compute and display the average of all the numbers entered.

This is an *accumulation* problem

Working with user input

Read in a series of numbers until the user enters -1.
Then print out the average of all the numbers entered:

Whenever you see “until”, it implies you will likely need a loop

Whatever comes after “until” is probably going to be your “test” - need to express as boolean expression

The -1 is referred to as a sentinel - indicates the user is complete
(we can pick any number, but -1 is customary)

Input validation

do-while loops are great for error checking:

Instead of :

```
cin >> x;
if ( x < 0 ) {
    cout << "Enter positive number" << endl;
    return 0; // exit program
}
```

Use do-while:

```
do {
    cout << "Enter positive number" << endl;
    cin >> x
}while (x < 0 );
```

Programming Example 19

Allow a user to enter a series of **positive** numbers, and print the square root after each.

Do not allow any negative numbers (except -1) to be entered.

Stop when the user enters -1.

Lab 06

Implement a “guessing game”.

- Initially, compute a random number between 0 and 10 - don't print it out!
- Ask the user for guesses
 - If they guess too low print “Too low”
 - If they guess too high print “Too high”
 - If they get it right, say congratulations
 - Tell them how many guesses it took them

+3 extra credit: After guessing correctly, let them play **again**, making sure to initialize the random number and the guess count again.