COMPUTER SCIENCE 1: STARTING COMPUTING CSCI 1300

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Ioana Fleming / Vipra Gupta
Spring 2018
Lecture 12

Agenda

- This week
  - for loops
  - arrays

Announcements

- Rec 5 due on 2/17
- Hmwk 4 (1st Project) due 2/18
- Practicum 1 has been scheduled:
  - February 21st, 2018
  - In lecture. 50 minutes. Bring a laptop!
  - Review: in lecture on 2/19
  - Visible in *Tentative Schedule* on Moodle

Here is what will be on the Practicum

- Multiple Choice Questions (4 or 5 questions)
- Write 3 functions to solve 3 tasks
- Tasks will require you apply
  - Declare functions (return value, parameters)
  - Declare and assign values to variables
  - Use boolean expression for conditionals
  - IF statements
  - IF-ELSE statements
  - Nested IF statements (IF-ELSE IF - …)
  - Iteration via a WHILE statement

Practicum - logistics

- Bring your student ID (knowing your number is not enough)
- 50 minutes
- No cheat sheet
- No communication: no phones, smart watches, messaging apps, no windows open except Moodle and Cloud9
- You have access to all previous created solutions in Cloud9

Practice, practice, practice!

- Review all previous Moodle programming questions from previous recitation and homework assignments
- Review examples we did in class
- Time is short; prepare accordingly.
- Two Practice Practicum Quizzes:
  - one with programming questions
  - one with multiple-choice questions

Tips for Timed Exam

- Read the Questions
  - read them not once, but **TWICE** before starting the code
  - follow all the instructions explicitly (especially for names and order of parameters)

- Create or Modify a Code
  - know your C++ syntax

- Create and Use an IF, IF ELSE
  - know your C++ syntax
  - know how to create a condition

- Create and Use a WHILE
  - know your C++ syntax
  - know how to iterate through a string's characters

- Passing parameters
  - know your C++ syntax

for Loop Syntax

```
for (Init_Action; Bool_Exp; Update_Action)
    Body_Statement
```

- Like if-else, Body_Statement can be a block statement
  - Much more typical

for Loop Example

-
  ```
  for (count=0;count<3;count++)

  {
   cout << "Hi ";   // Loop Body
  }
  ```
- How many times does loop body execute?
- Initialization, loop condition and update all "built into" the for-loop structure!
- A natural "counting" loop

While loops vs for loops

- Cloud9 examples: *liftoff.cpp*

Loop Issues

- Loop’s condition expression can be ANY boolean expression
- Examples:

```
while (count<3 && done!=0)
{
     // Do something
}
for (index=0;index<10 && entry!=-99)
{
     // Do something
}
```

Loop Pitfalls: Misplaced ;

- Watch the misplaced ; (semicolon)
  - Example:

```
while (response != 0) ;←
{
     cout << "Enter val: ";
     cin >> response;
}
```

  - Notice the ";" after the while condition!
- Result here: INFINITE LOOP!

Loop Pitfalls: Infinite Loops

- Loop condition must evaluate to false at some iteration through loop
  - If not → infinite loop.
  - Example:
    ```
    while (1)
    {
            cout << "Hello ";
    }
    ```
  - A perfectly legal C++ loop → **always infinite!**
- Can we create an infinite *for* loop?

Loop Pitfalls: Infinite Loops

- Can we create an infinite *for* loop?

- In the case of *for* loops, if we modify the loop variable
  - Example:

```
for (i = 0; i < 5; i++)
{
        cout << "Hello ";
         i--;
}
```

Practice Problem

Read string from the user. If string is email address display “You have mail!”

- looking for the @ character

Nested Loops

- Recall: ANY valid C++ statements can be inside body of loop
- This includes additional loop statements!
  - Called "nested loops"
- Requires careful indenting:

```
for (outer=0; outer<5; outer++)
    for (inner=7; inner>2; inner--)
        cout << outer << inner;
```

  - Notice no { } since each body is one statement
  - Good style dictates we use { } anyway