CSCI-1411 Fundamentals Of Computing Lab

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Fall 2015

Lab 1: Introduction to Programming and the Translation Process

- Overview:
  - Components of a Lab
    - Lab Sections (1.1, 1.2, ...)
    - Comments
    - Style
    - Exercises
    - Writing your own program
    - Design Documents
  - Lab 1
    - Syntax Errors
    - Logic Errors
    - Runtime Errors

C++ Comments and Exercise Questions

☐ Comments are ignored by the C++ compiler (GCC)

- ◻ Utilized to explain 'what' the code does or 'why'

- ◻ Use comments at the end of your source file to answer the questions to the exercises

- ◻ C++ Has two forms of comments:
  - ■ Line Comments (// …)
  - ■ Block Comments (/* … */)

C++ Comments and Exercise Questions

☐ **Line and (inline) Comments**

```cpp
// This is a line comment, everything on this line is ignored
int main()
{
    int radius = 4; // The radius of the user circle.
}
```

☐ **Block Comments**

```cpp
int main()
{
    double c = 1.0;
}
/*
 * Block Comment:
 * Here, everything is a comment and will be
 * ignored. Use this space to answer the exercise questions.
 */
```

C++ Quick Style Guide

☐ Quick Rules for Proper Styling

 ◘ Properly indent code

 ◘ Ensure that the "{ }" curly braces are well formed

 ◘ Use adequate variable names:
  ▪ int a, b, c, d, e, f; ← What do any of these mean?
  ▪ int userRadius, calculatedCircumference; // Better

 ◘ Example

C++ Quick Style Guide

```cpp
#include <iostream>
using namespace std;


int main()
{
    int numberOfApples= 4;

    // If there are a lot of apples, then print a message
    // to the user.
    if ( numberOfApples >= 4 )
    {
        cout << "That is a lot of apples." << endl;
    }

    return 0;
}
```
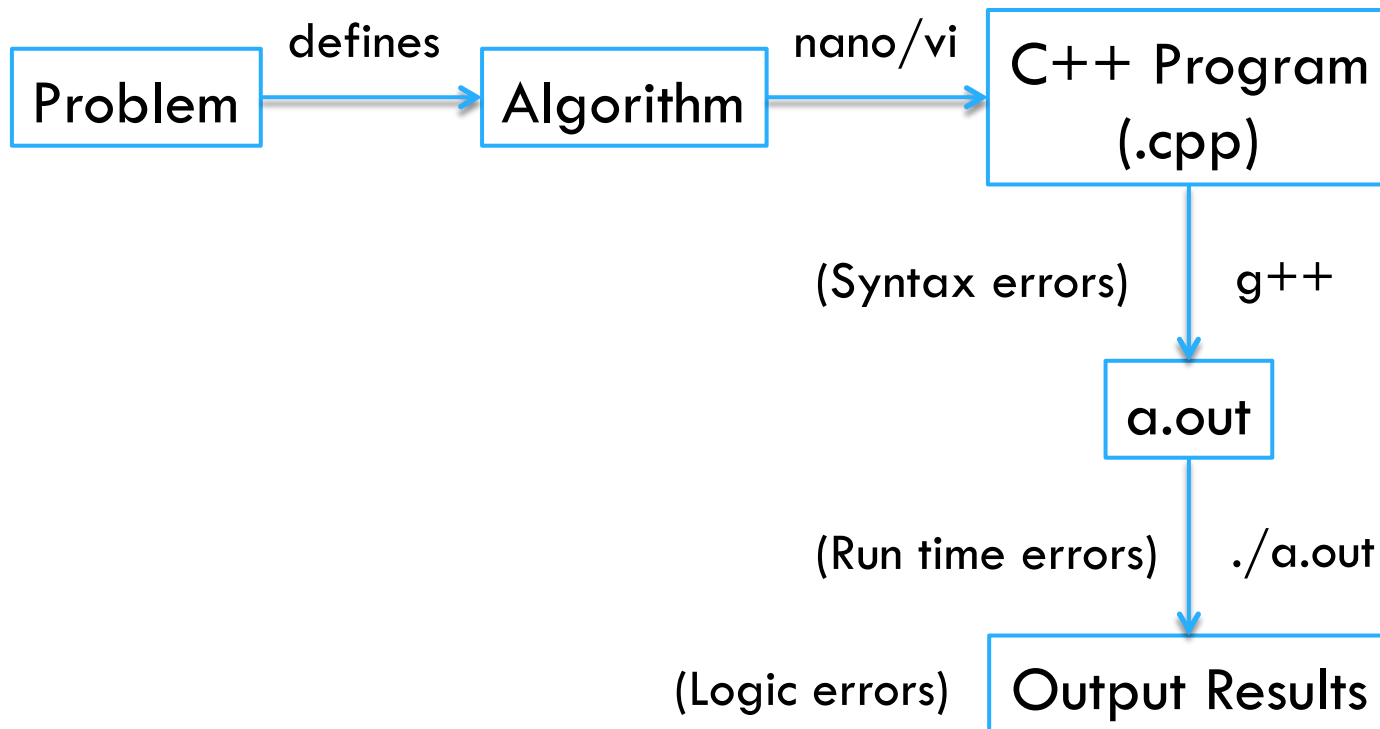
~~C++ Quick Style Guide~~

```cpp
#include <iostream>
using namespace std;int main(){int numberOfApples=4;if(numberOfApples>=4){
cout<<"That is a lot of apples."<<endl;}return 0;}
```

☐ Source code is for humans! The Compiler doesn't care.

C++ Programming Process

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- 1.1 Opening, Compiling and Running your First Program
  - (firstprog.cpp)
  - Answer questions asked in exercise 4

- 1.2 Compiling a Program with a Syntax Error
  - Syntax Errors are detected by the compiler (g++)
  - (semiprob.cpp)
  - Answer questions asked in exercise 3 and 4

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- 1.3 Running a Program with a Run Time Error
  - Does something unexpected that may prevent the program from continuing execution (Division by zero)
  - (runprob.cpp)
  - Answer questions asked in exercise 4 and 5

- 1.4 Working with Logic Errors
  - Logical errors are harder to detect
  - The program compiles and executes, but does not do what we 'intended'
  - (logicprob.cpp)
  - Answer questions asked in exercise 3

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- 1.5 Writing Your First Program (Not optional)
  - Write a design document
    - Description of the algorithm
    - Input / Output
    - Flow-Chart, diagrams, Explanations, Equations
    - Expected Results
    - Save as (*.doc, *.docx, *.pdf, *.txt, *.rtf)
  - Save this source file as: (kilotomiles.cpp)
  - Answer questions asked in exercise 3

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- Submission File Checklist
  - Submit all files on Canvas (One at a time or all of them in a single zip file). Be sure to include all source files and documents.

  - 1.1 firstprog.cpp
  - 1.2 semiprob.cpp
  - 1.3 runprob.cpp
  - 1.4 logicprob.cpp
  - 1.5: kilotomiles.cpp
  - 1.5: designdocument.pdf