

COLLEGE OF ENGINEERING School of Election and Computer

School of Electrical Engineering and Computer Science

## CS 161 Intro to CS I

#### What is CS all about?

# **Odds and Ends**



- Assignment 1 Due Sunday, 11:59pm
- Questions?



## **Reflections**

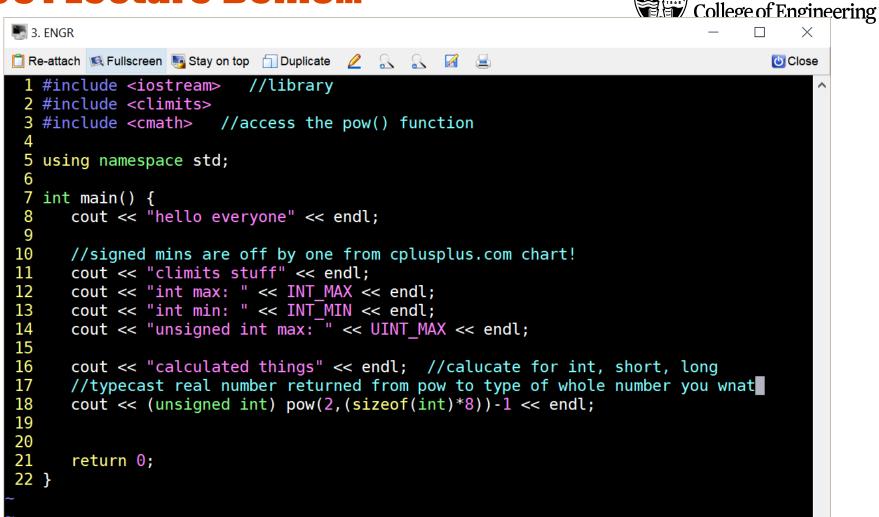
- What do the following Linux commands do?
   -Is 1; st contents of directory/folder
   -mkdir create directory
   -cd change directory
- What is vi/vim? Lext ed, tor
- How do get into the insert mode? Command mode?

# 001 Code/002 will finish Friday



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# **001 Lecture Demo...**



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## **002 Lecture Demo...**

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                                                                                     \times
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 1 #include <iostream> //brings in library, by preprocessor directive
                                                                                             ~
 2 #include <climits>
 3 #include <cmath>
 4
 5 using namespace std;
 6
 7 int main() {
      cout << "hello" << endl;</pre>
 8
 9
      cout << "climits" << endl;</pre>
10
      cout << "LONG MAX: " << LONG MAX << endl;</pre>
11
      cout << "SHRT MAX: " << SHRT MAX << endl;
12
      cout << "SHRT MIN: " << SHRT MIN << endl;</pre>
13
      cout << "USHRT MAX: " << USHRT MAX << endl;
14
15
      cout << "sizeof" << endl; //calucate for int, short, long</pre>
      //typecast real number returned from pow to type of whole number you wnat
16
17
      cout << (unsigned short) pow(2,sizeof(short)*8)-1 << endl;</pre>
18
      cout << pow(2,sizeof(long)*8)-1 << endl; //without typecast, you get real #</pre>
19
      cout << (unsigned long) pow(2,sizeof(long)*8)-1 << endl;</pre>
20
21
      return 0;
                   //there are no problems
22 }
```

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### More C++

- Programming Style: please read your class style guide
  - Program Header/Description
  - Placement of {}
  - Indentation: spaces vs. tabs
- String Literal in quotations, ""
  - Not single quotes!
    - INCORRECT: std::cout << `Hello World';
  - Do not span more than one line!
    - INCORRECT: std::cout << "Hello World";

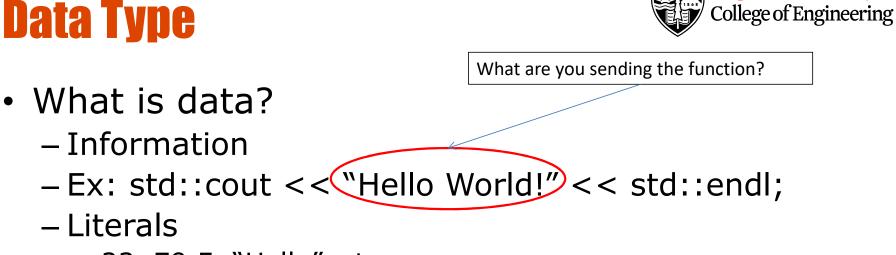


## More C++

- Escape Sequences
  - Display special characters
  - Use backslash,  $\$ , before special character to print
- Examples:

std::cout << "\"Hello World\"\n";</pre>

 Refer online for common escape sequences: <u>http://en.cppreference.com/w/cpp/language/es</u> <u>cape</u>



- 23, 79.5, "Hello", etc.
- What is a data type?
  - Description of the kind of information
    - Primitive Data
    - User Created (we will cover later)

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# **C++ Primitive Types**

- char, double, float, int, long, short, bool
- Fundamental
  - **short/int/long**: whole numbers, e.g. 45, -89, 0
  - float/double: real numbers, e.g. 2.612, -30.5, 2.3e5
  - char: characters, e.g. 'A', '&', 'x', '\"
- Signed by default, need to preface with unsigned keyword
  - unsigned int
  - unsigned float
  - unsigned char

# Assignment #1 Macros



- C++: <climits>
- Use MIN and MAX macros from library <u>http://www.cplusplus.com/reference/clibrary/climits/</u> (Note that the values listed are not the values on our system!!!)
  - INT\_MAX
  - INT\_MIN
  - LONG\_MAX
  - LONG\_MIN
  - SHRT\_MAX
  - SHRT\_MIN
- Remember unsigned too...

# What is an expression?



 Set of operations producing a value 12 \* 4 + 6 \* 10 ((12 \* 4) + 6) \* 10



# **Pieces of an Expression**

- **Operators**: indicate operation
  - -Add +
  - Subtract -
  - Multiply \*
  - Divide /
  - Remainder %
- **Operands**: values in the expression
- Evaluation: process of obtaining results from operations on operands



## **Arithmetic**

### Integer Arithmetic

std::cout << 3/8; /\*prints 0\*/
std::cout << 34/5; /\*prints 6\*/</pre>

### Floating Point Arithmetic

std::cout << 34.0/5.0; /\*prints 6.8\*/
std::cout << 3.0/8; /\*prints .375\*/
std::cout << 3/8.0; /\*prints .375\*/</pre>



# **Type Casting**

### Casting

std::cout << 34 / (int) 5.0; /\*prints 6\*/
std::cout << (int) (34 / 5.0); /\*prints 6\*/
std::cout << (float) 34 / 5; /\*prints 6.8\*/</pre>

 What is wrong with these? std::cout << (int) 34 / 5.0; /\*prints 6.8\*/ std::cout << (float) (34/5); /\*prints 6.0\*/</li>



## **Precedence**

- What is precedence?
  - Binding power of operator

-(\*,/, %) vs. (+, -)

- How do we override precedence?
   Parenthesis!
- Examples:

12 \* 4 + 6 \* 10 vs. ((12 \* 4) + 6) \* 10

## **Size of Things Demo...**



