EECS 161
Intro to Programming I

Finish Variables/Constants &
Begin User Input
Chap. 1.2 – 1.4
Expressions

• What is an expression?
  – Set of operations producing a value
  • Combining simple values
  
  \[ 12 \times 4 + 6 \times 10 \text{ vs. } ((12 \times 4) + 6) \times 10 \]
Expressions cont.

• Pieces of an Expression:
  – Operators
    • Indicate operation, e.g. +, *, /, -, %
  – Operands
    • Values in the expression
  – Evaluation
    • Process of obtaining results from operations on operands
Arithmetic Operators

- **Add**
  
  34 + 23

- **Subtract**
  
  34 - 23

- **Multiply**
  
  2 * 23

- **Divide**
  
  40 / 10

- **Remainder/Mod**
  
  34 % 5
Arithmetic

• Integer Arithmetic
  std::cout << 3/8;  /*prints 0*/
  std::cout << 34/5;  /*prints 6*/

• 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*/
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*/

• What is wrong with these?
  std::cout << (int) 34 / 5.0; /*prints 6.8*/
  std::cout << (float) (34/5);  /*prints 6.0*/
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
How do we read into a variable in C++?

- Declare a variable
- Read value from user and store at variable location
- How do we do this?

```cpp
#include <iostream>

int main() {
    int x;
    std::cin >> x;
    std::cout << x;
    return 0;
}
```