C++ Variables

Instructor: Andy Abreu
Variables in C++

• Allows storage of data internally for the program
• Allows storage of information from the user
• There are different types of variables which services different needs
• Examples:
  – Variables that store texts
  – Variables that store integers (positive & negative numbers)
  – Variables that store decimals (floating point numbers)
Declare / Create Variables

• In order to use a variable in C++, we must first declare it. Think of declaring a variable as creating the variable.

• Model:

  \[ \text{variable\_type variable\_name} \; ; \]

  – variable\_type: The type of the variable, different type stores different type of information.
  – variable\_name: The name of the variable, how they will be referred to in the rest of the program.
Legal Variable Names

• C++ rules for legal variable names
  – 1. Must start with a letter, can end with numbers
  – 2. Must not have a space in the name
  – 3. Can not have special characters
    • Only allow character is _ (underscore)
  – 4. Must not be a C++ keyword

• Suggestions for variable names
  – Variable names should be meaningful
  – Variable names should be easy to read
Illegal Variable Names

• Example of illegal variable names
  – int number of cakes;
    • space
  – int 1number;
    • Begins with number
  – int discount%;
    • symbols
  – double int;
    • keyword
  – int string;
    • keyword
Important Note

• C++ is case sensitive!!

• Examples:

  – int hello; //declares a variable hello
  – int Hello; //declares another variable Hello
  – Int hello; //error, Int is not a C++ type
  – Double amount; //error, Double is not a type
Types of variables
String

• Variable declaration
  – string name;
  – string address;
  – string day;

• Examples of strings
  – name = "Vincent";
  – address = "65-30 Kissena Blvd.";
  – day = "2";

• Examples of INVALID strings
  – name = 'Vincent';
  – address = 65-30 Kissena Blvd.;
  – day = 2;
int (integers)

• Variable declaration
  – int number;
  – int year;
  – int age;

• Examples of integers
  – number = 14;
  – year = 2011;
  – age = 30;

• Examples of INVALID int
  – number = "14";
  – year = '2011';
  – age = "thirty";
  – age = 34.5;
double (decimals, high precision)

- Variable declaration
  - double pi;
  - double e;
- Examples of double (decimals)
  - pi = 3.1415926535;
  - e = 2.71828;
- Examples of INVALID double
  - pi = "3.141";
  - pi = ' 3.141 ';

char (characters)

• Variable declaration
  – char c;
  – char newline;
  – char code;
• Examples of char (characters)
  – c = 'c';
  – newline = '\n';
  – code = 65; //max number is 127
• Example of INVALID char
  – code = 456;
  – newline = "\n";
bool (boolean: true or false)

• Variable declaration
  – bool answer;
  – bool reply;
• Examples of bool (boolean)
  – answer = true;
  – answer = false;
  – reply = 0;
  – reply = 1;
• Examples of INVALID bool
  – answer = "false";
  – reply = '0'; //will be true