DASL 130 – C Programming Course

Lecture 1

Compiler

- A compiler turns C code into machine code, in other words an executable file

- Dev-C++
  - http://www.bloodshed.net/devcpp.html

Basic Program

- “Hello World” Code:

```
#include <stdio.h>

int main()
{
  printf("Hello World!");
  scanf(" ");
  return 0;
}
```

Variables

- Format:
  - Type name = value;
  - Variable names: start with a letter, can not be a keyword
  - Convention is lowercase for variables, uppercase for constants

Types

- Char – 1 byte
  - Signed is -128 to 127
  - Unsigned is 0 to 255
  - ASCII Table converts char values to characters
  - Escape sequences:
    - \n – new line
    - \r – line return
    - \t – tab
    - \’ \” - quotes

Types

- Int
  - short int – at least 16 bits
  - int – no larger than long, no shorter than short
  - long int – at least 32 bits (-2 billion to 2 billion)
  - long long int – at least 64 bits
  - Escape sequences
    - Octal - \000
    - Hex - \x00

Types

- Float and Double
  - Float – 6 digit precision
  - Double – 12 digit precision
  - Precision is number of digits

sizeof() – returns size of a variable in bytes

Qualifiers and Casting

- Type Qualifiers
  - const – variable cannot be modified
  - volatile – prevents compiler from optimizing around variable
- Type Casting
  - Allows conversion of variable types
  - float test = (float)5

Operators

- Arithmetic

  + , - , * , / , % (modulus)

  ++ , -- (prefix and postfix incrementation)

  += , -= , *= , /= , %=

- Logical

  && , || , == , !=

- Bit Shifting

  << , >> , | , & , ^

Standard I/O

- Basic Output – printf()
  - printf("An integer is %d\n", int var);
  - d/i = int, f = floating point, e = exponential notation, c = single char, s = string, o = octal, x/X = hex, u = unsigned int
- Basic Input – scanf()