CIS 1057 Chapter 6

Pointers and Modular Programming

A datum has an address in memory

- Computer memory
  - Arranged in cells with addresses
- Declare an int with a value
  - int i = 5;
- Get address of I
  - int *i_ptr = &i;
- What happens in memory when data is declared?

Addresses and indirection

- The & is the address of or reference operator
  - scanf("%d", &n);
- The * is the indirection or dereference operator

Passing data by reference

- Pass by value return result
  - int n = add(a, b);
- Pass by reference
  - Using scanf()
  - int i = 0;
  - printf("Enter an integer: ");
  - scanf("%d", &i); ← &i is the address of i

Multiple output parameters

- Functions can actually return more than one value.
  - Pass by reference: get_frac(int &n, int &d);
- Can mix value and reference parameters in functions

Multiple calls with I/O params

- Sort 3 ints
  - The order() function

Pointer arithmetic

- Will perform math ops based on size of data
  - Char
  - Short
  - Int
  - Float
  - Double
  - Pointer

Scope of data

- Global – all functions
- Local – in a function

Fractions – Passing Addresses

- Get op → return a single char
- Get a fraction
  - Use parameters as outputs
  - Return more than one primitive data type
- Swap → Swap two parameter values
- Do op + → mixes pass by value and reference
- GCD → Accept 2 ints by value return one int
- Reduce → Accept 2 references
- Do ops for –, * /