# C Reference Sheet v0.3

Made for CS-2113 by Dr. T. Wood @ GWU

## The Simplest Program

```
#include <stdio.h>
int main ()
{
   printf("CRUSH all humans!\n");
   return 0;
}
```

## Control Structures

```
/* if-statement: */
if (i == 1) {
    printf ("one\n");
}
else if (i == 2 || i == 3) {
    printf ("two or three\n");
}
else {
    printf ("not 1, 2, or 3\n");
}

/* for-loop example: */
int i; // cannot declare inside loop
printf ("Numbers 0 through 9: \n");
for (i=0; i < 10; i++) {
    printf (" %d\n", i);
}

/* while-loop example*/
float f = 0;
printf ("Some floats < 10: \n");
while (f < 10) {
    printf (" %f\n", f);
    f+=1.75;
}

/* switch statement example: */
switch (i) {
  case 1: {
    printf ("one\n");
    break;
  }
  case 2: {
    printf ("two\n");
    break;
  }
  default: {
    printf ("something else\n");
  }
}
```

## Variables and Arrays

```
int i; // must declare at top of block
float j = 10.341; // declare and set

int profits[52];
profits[0] = 100; // first entry
profits[51] = 1000; // last entry

float temps[10]; // can use any type
temps[4] = 84.512;
```

**Warning: vars start filled with junk!**

| Type | Storage* | Range | printf label |
|---|---|---|---|
| (unsigned) char | 1 byte | one letter (or -128 to 128) | %c or %d |
| (unsigned) int | 4 bytes | -2,147,483,648 to 2,147,483,647 | %d (%u) |
| (unsigned) short | 2 bytes | -32,768 to 32,767 | %d (%u) |
| (unsigned) long | 4 or 8 bytes | -2,147,483,648 to 2,147,483,647 | %ld (%lu) |
| (unsigned) long long | 8 bytes | -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807 | %lld (%llu) |

| Type | Storage | Approximate Precision | printf label |
|---|---|---|---|
| float | 4 Bytes | 6 decimal places | %f |
| double | 8 Bytes | 15 decimal places | %lf |
| long double | 10 Bytes | 19 decimal places | %llf |

*Exact storage size varies by system. These are typical for 32bit architectures.

## Compiling, and Running Code

```
gcc file.c -o execname
./execname
```