

A First Program: helloWorld

```
1: #include <stdio.h>
2: int main(void)
3: {
4:     printf("Hello_World\n"); /*one line of output*/
5:     return 0;
6: }
```

- note: no class or objects mentioned
- line 1 includes standard IO library interface (header file)
- main() is a special function – in this case with no arguments
 - can use `int main(int argc, char *argv[])` to access the command line parameters
- prints the string "Hello_World" followed by a new line
- returns the function's result (to the operating system)
 - '0' signifies normal termination

Basic C Program Structure

```
/*    */           comment line
#include <...>      directives
int main(void)     function main() heading
{
    declarations   variables declared

    statements     body of main()
    return 0;      return statement
}
```

- we could write

```
int main(void){ printf("Hello_World\n"); return 0; }
```

... but it would be bad style! (and C allows you to do worse...)

Compiling and Running your C Program

- if your program is in a single file called `helloWorld.c`, create an executable program by using the following command:

```
gcc -Wall -o helloWorld helloWorld.c
```

where:

```
gcc           → the GNU C compiler
-Wall        → show all warnings
-o helloWorld → name of executable
```

- run your program by typing the name of the executable

```
partch:~/comp2300/C1> ./helloWorld
Hello World
partch:~/comp2300/C1>
```

- with program made of multiple C files, separate compilation and linking is best - we will discuss this later

Basic Data Types

- integer (signed or unsigned):
 - char (8 bit integer)
 - short int (small integer)
 - int (standard integer)
 - long int (long integer)
- floating-point:
 - float (standard precision float - 32 bit)
 - double (higher precision float - 64 bit)
- typeless/valueless:
 - void
- no Boolean data type; instead: 0 is 'false' and non-0 is 'true'
- sizes are not explicitly defined, but relative size is respected


```
1: #include <stdio.h>
2: #define COURSE "comp2300"
3: int main(void) {
4:     int day=2, year=2006;
5:     char month[]="March";
6:
7:     printf("Hello_%s\n", COURSE);
8:     printf("Today's_date_is_%d,_%s,_%d\n", day, month, year);
9:     printf("\n\n\t\t(it's_Thursday)\n");
10:
11:     return 0;
12: }
```

- what's the value of the following C expression?

$7+4*2\%6*4$

- is the following true or false?

$(16-3<4*3+4) \ || \ (7*2==28/2) \ \&\& \ !(16-3<12+6)$

- are the following all equal?

$3*4/2$

$4*3/2$

$3/2*4$

$4/2*3$

- remember: C is *not* Java!

printf(): Fancy Formats

- look at King ch 3 and consider...

```
1: #include <stdio.h>
2: int main(){
3:     int i=0;
4:     float fx=5.0/3.0;
5:     char me[]="Peter_Christen";
6:     printf("_character_%c_integer_%d_\n", 65, 'A');
7:     for (i=0; i<128; i++){
8:         printf("_character_%c_%d_%o_%x_\n", i, i, i, i);
9:     }
10:     printf("%10.2f_%-10.2f_+10.2f\n", fx, fx, fx);
11:     printf("%s%20s%20.4s%-20.4s\n", me, me, me, me);
12:     return 0;
13: }
```