# Week 1 solutions

## Hello world!

Create a file (`hello.c`) with the following content:

```c
#include <stdio.h>

int main(void)
{
  printf("Hello World!\n");
  return 0;
}
```

Create a file `Makefile` with the following content:

```
CFLAGS= -Wall -std=c99
LDLIBS= -lm
```

Notice the flag `-lm` assigned to the `LDLIBS` variable. This tells the linker to link against the math library `libm` which is needed in some of the exercises since we will be using the `floor` function defined in the header file `math.h`.

Compile and run the program using the following commands:

```
$ make hello
$ ./hello
Hello World!
```

## Exercise 2-3

Create a file (`exercise_2_3.c`) with the following content:

```c
#include <stdio.h>

int main(void)
{
  int quantity1 = 0, quantity2 = 0;
  const float price1 = 3.50, price2 = 5.50;

  printf("Product 1 (standard edition) : $3.50 ea\n"
         "Product 2 (deluxe edition)   : $5.50 ea\n");
  printf("Please enter quantity of product 1: ");
  scanf("%d", &quantity1);
  printf("Please enter quantity of product 2: ");
  scanf("%d", &quantity2);
```

```
  printf("Total price: $%.2f\n",
         quantity1*price1 + quantity2*price2);

  return 0;
}
```

Notice that the first `printf` statement includes a single argument which consists of two strings on separate lines—these are automatically concatenated by the compiler.

Compile and run the program using the following commands:

```
$ make exercise_2_3
$ ./exercise_2_3
```

## Exercise 2-4

Create a file (`exercise_2_4.c`) with the following content:

```
#include <stdio.h>
#include <math.h>

int main(void)
{
  float wage = 0.0, hours = 0.0, hourly = 0.0;

  printf("Please enter your weekly pay in dollars: ");
  scanf("%f", &wage);
  printf("Please enter number of hours: ");
  scanf("%f", &hours);
  hourly = wage/hours;
  printf("Your hourly pay rate is %.0f dollars and %.0f cents.\n",
          floorf(hourly),100*(hourly-floorf(hourly)));

  return 0;
}
```

Compile and run the program using the following commands:

```
$ make exercise_2_4
$ ./exercise_2_4
```

## Hex representation of integer

The number 2,343,432,205 is larger than $2^{31} - 1$ but smaller than $2^{32} - 1$, so it can be represented as an unsigned 32 bit integer. (Recall that the range of a signed 32-bit integer is from $-2^{31}$ to $2^{31} - 1$ whereas the range of an unsigned 32-bit integer is from 0 to $2^{32} - 1$.)

Create a file (`hexrepr.c`) with the following content:

```c
#include <stdio.h>

int main(void)
{
  unsigned long a = 2343432205UL;

  printf("The hex representation of %lu is: %lx\n",a,a);

  return 0;
}
```

Compile and run the program using the following commands:

```
$ make hexrepr
$ ./hexrepr
The hex representation of 2343432205 is: 8badf00d
```