Exercise 1

```
#include <stdio.h>
int main(void)
{
	printf("Hello world!\n");
	return 0;
}
/*utilizing terminal to write command*/
/*utilizing cd and dir to check directory*/
/*compiling the file by using gcc HelloWorld.c -o HelloWorld*/
/*run the file by using ./HelloWorld*/
```

Exercise 2

In C programming pointer variable is holding an address of variable and contain the data type. The difference between pointer and non-pointer is that while the variable is not declared as a pointer, the memory will be allocated during compiling and cannot be referenced to different address. For example, *ip is a pointer variable which save the address of integer variable.

Exercise 3

Interpreted code execute the instructions directly and freely without compiling into machine language and there is one process from source code to execution. We can modify during the running. On the other hand, the compiled code will be transformed to machine language and execute by the transformed language. There are at least two process from source code to execution. The difference between compiled and interpreted code is that compiled code will perform faster which convert all the code and the compiled code will be debug first after running.

Exercise 4

(a)0x1E: 16*1+14=30 (base 10), 00011110 (base 2), msb=0
(b)0x32: 16*3+2=50 (base 10), 00110010 (base 2), msb=0
(c)0xFE: 16*15+14=254 (base 10), 11111110 (base 2), msb=1
(d)0xC4: 16*12+4=196 (base 10), 11000100 (base 2), msb=1

Exercise 6

16*16=256 bits

Exercise 7

(a) ch =’k’, 107 (decimal)

(b) ch =’5’, 53 (decimal)

(c) ch =’=’, 61 (decimal)

(d) ch =’?’, 63 (decimal)

Exercise 8

Unsigned char: 0 to 255

Short: -32768 to 32767

Double: ±1.7e-308 to ±1.7e308

Exercise 10

Unsigned integers mean the range include positive and negative numbers.

Signed integers mean the range only include positive numbers and also include 0.

Exercise 11

(a) char: 1bit, range: -128 to 127

int: 4 bits, range: -2^31 to 2^31-1

Char use less memory than int. However, the range of the char is smaller than int.

(b) float: 4 bits, range: -2^256 to 2^256

double: 8bits, range: -2^2048 to 2^2048

Float use less memory than double. However, the range of the float is smaller than double.

(c) char: 1bit, range: -128 to 127

float: 4 bits, range: -2^256 to 2^256

Char use less memory than float which cause less calculating time. However, the range of the char is smaller than float.

Exercise 16

In an integer, with 4 bytes memory space the range is from -2147483648 to 2147483647. In a float, with 4 bytes memory space the range is from ±3.4e-38 to ± 3.4e38. In 32 bits in floating numbers, 1 bit represents the sign of the number, and the m is equal to 23 which is the 2^23, and the n equals to 8. The pointer to type double is the most similar to floating point data type.

Exercise 17

(b) kp equals to pointer of integer i which is known

(c) j equals to the value of i which is unknown

(d) i equals to 0xAE
(e) np equals to kp which is the pointer of integer i
(f) *&i equals to 0x12 which i is 0x12
(g) j equals to i which is 0x12