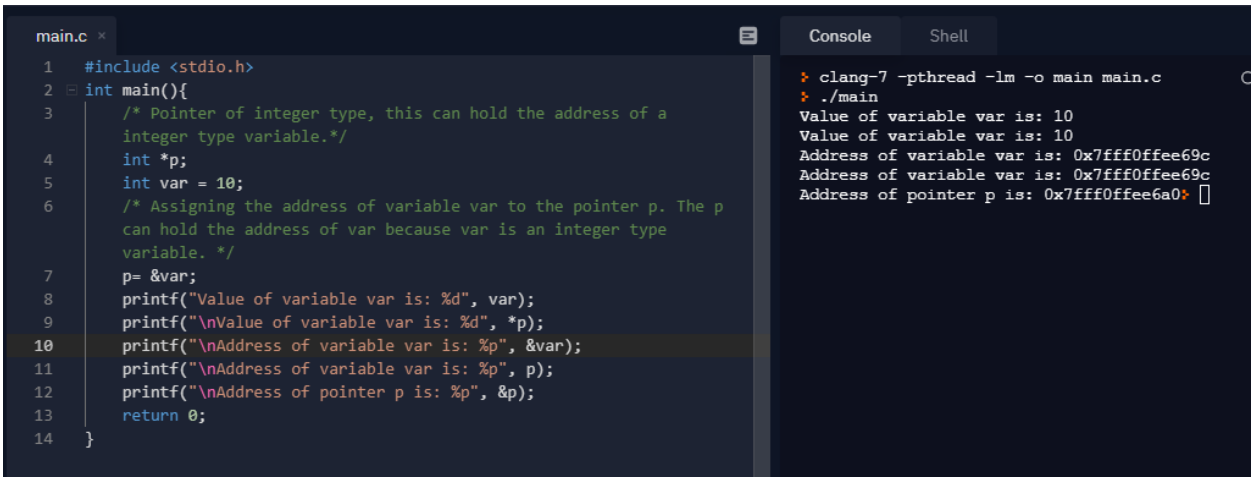
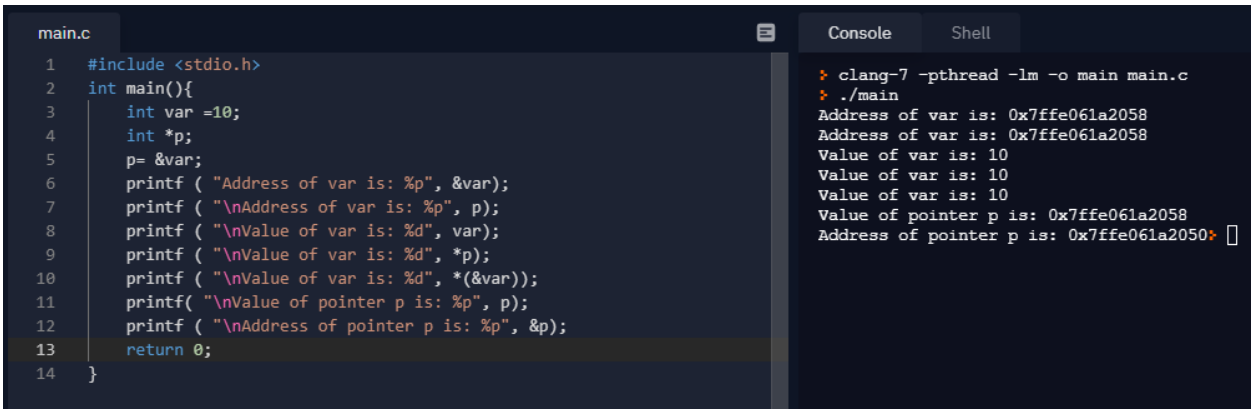
Exercise 1



```c
#include <stdio.h>
int main(){
    /* Pointer of integer type, this can hold the address of a
    integer type variable.*/
    int *p;
    int var = 10;
    /* Assigning the address of variable var to the pointer p. The p
    can hold the address of var because var is an integer type
    variable. */
    p= &var;
    printf("Value of variable var is: %d", var);
    printf("\nValue of variable var is: %d", *p);
    printf("\nAddress of variable var is: %p", &var);
    printf("\nAddress of variable var is: %p", p);
    printf("\nAddress of pointer p is: %p", &p);
    return 0;
}
```

```
clang-7 -pthread -lm -o main main.c
./main
Value of variable var is: 10
Value of variable var is: 10
Address of variable var is: 0x7fff0ffee69c
Address of variable var is: 0x7fff0ffee69c
Address of pointer p is: 0x7fff0ffee6a0
```

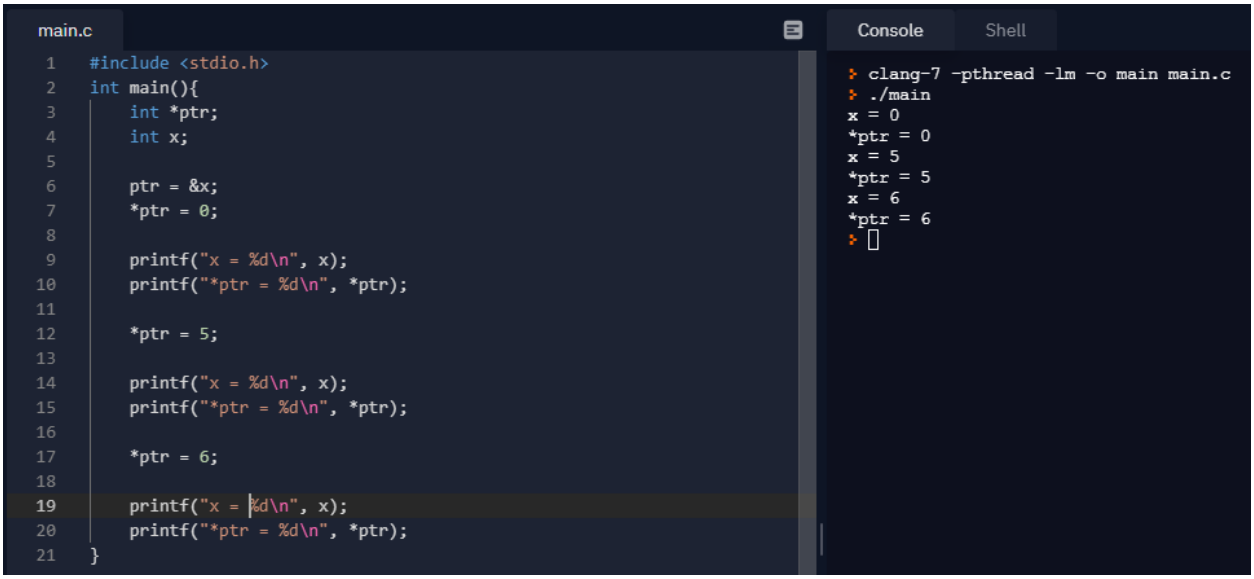
Exercise 2



```c
#include <stdio.h>
int main(){
    int var =10;
    int *p;
    p= &var;
    printf ( "Address of var is: %p", &var);
    printf ( "\nAddress of var is: %p", p);
    printf ( "\nValue of var is: %d", var);
    printf ( "\nValue of var is: %d", *p);
    printf ( "\nValue of var is: %d", *(&var));
    printf( "\nValue of pointer p is: %p", p);
    printf ( "\nAddress of pointer p is: %p", &p);
    return 0;
}
```

```
clang-7 -pthread -lm -o main main.c
./main
Address of var is: 0x7ffe061a2058
Address of var is: 0x7ffe061a2058
Value of var is: 10
Value of var is: 10
Value of var is: 10
Value of pointer p is: 0x7ffe061a2058
Address of pointer p is: 0x7ffe061a2050
```

Exercise 3



```c
#include <stdio.h>
int main(){
    int *ptr;
    int x;

    ptr = &x;
    *ptr = 0;

    printf("x = %d\n", x);
    printf("*ptr = %d\n", *ptr);

    *ptr = 5;

    printf("x = %d\n", x);
    printf("*ptr = %d\n", *ptr);

    *ptr = 6;

    printf("x = %d\n", x);
    printf("*ptr = %d\n", *ptr);
}
```

```
clang-7 -pthread -lm -o main main.c
./main
x = 0
*ptr = 0
x = 5
*ptr = 5
x = 6
*ptr = 6
```

Exercise 4

main.c

```c
#include <stdio.h>
int main(){
    int fno, sno, *ptr, *qtr, sum;

    printf("\n\n Pointer : Add two numbers :\n");
    printf("-------------------------------\n");

    printf(" Input the first number : ");
    scanf("%d", &fno);
    printf(" Input the second number : ");
    scanf("%d", &sno);

    ptr = &fno;
    qtr = &sno;

    sum = *ptr + *qtr;

    printf(" The sum of the entered numbers is : %d\n\n",sum);

    return 0;
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main


 Pointer : Add two numbers :
-------------------------------
 Input the first number : 10
 Input the second number : 20
 The sum of the entered numbers is : 30
```

Exercise 5

main.c

```c
#include <stdio.h>
long addTwoNumbers(long *, long *);

int main(){
    long fno, sno, *ptr, *qtr, sum;
    printf("\n\n Pointer : Add two numbers using call by
    reference:\n");
    printf
    ("-------------------------------------------------------\n");
    printf(" Input the first number : ");
    scanf("%ld", &fno);
    printf(" Input the second number : ");
    scanf("%ld", &sno);
    sum = addTwoNumbers(&fno, &sno);
    printf(" The sum of %ld and %ld is %ld\n\n", fno, sno, sum);
    return 0;
}
long addTwoNumbers(long *n1, long *n2){
    long sum;
    sum = *n1 + *n2;
    return sum;
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main


 Pointer : Add two numbers using call b
---------------------------------------
----
 Input the first number : 10
 Input the second number : 40
 The sum of 10 and 40 is 50
```

Exercise 6

main.c

```c
#include <stdio.h>
int largenumber(int *, int *);

int main(){
    int fno, sno, largenum;
    printf(" Input the first number : ");
    scanf("%d", &fno);
    printf(" Input the second number : ");
    scanf("%d", &sno);
    largenum = largenumber(&fno, &sno);
    printf(" The large number is %d\n", largenum);
    return 0;
}

int largenumber(int *n1, int *n2){
    if (*n1 > *n2) {
        return *n1;
    }
    else {
        return *n2;
    }
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main
 Input the first number : 5
 Input the second number : 10
 The large number is 10
```

Exercise 7

main.c

```c
#include <stdio.h>

int add_two_number(int *a, int *b, int *result);
int main(void){
    int a, b, result;
    scanf("%d %d", &a, &b);
    result = add_two_number(&a, &b, &result);
    printf("%d + %d = %d\n", a, b, result);
    return 0;
}

int add_two_number(int* a, int* b, int* result){
    *result = *a + *b;
    return *result;
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main
654 981
654 + 981 = 1635
```

Exercise 8

main.c

```c
#include <stdio.h>

int sub_two_number(int *a, int *b, int *result);
int main(void){
    int a, b, result;
    int * a_ptr, *b_ptr, *result_ptr;
    a_ptr = &a;
    b_ptr = &b;
    result_ptr = &result;
    scanf("%d %d", &a, &b);
    result = sub_two_number(a_ptr, b_ptr, result_ptr);
    printf("%d - %d = %d\n", *a_ptr, *b_ptr, *result_ptr);
    return 0;
}

int sub_two_number(int* a, int* b, int* result){
    *result = *a - *b;
    return *result;
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main
654 981
654 - 981 = -327
```

Exercise 9

main.c

```c
#include <stdio.h>

int change_by_ptr(int* a, int b);
int change_by_double_ptr(int **a, int b);


int main(void){
   int a, b, c;
   int * a_ptr;
   int ** double_ptr;
   a_ptr = &a;
   double_ptr = &a_ptr;

   scanf("%d", &a);
   printf("change a to .. ");
   scanf("%d", &b);
   change_by_ptr(a_ptr, b);
   printf("now a is %d\n", a);
   printf("change a to .. ");
   scanf("%d", &c);
   change_by_double_ptr(double_ptr, c);
   printf("now a is %d\n", a);
   return 0;
}

int change_by_ptr(int* a, int b){
   *a = b;
   return 0;
}

int change_by_double_ptr(int** a, int b){
   int* mPtr = *a;
   *mPtr = b;
   return 0;
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main
10
change a to .. 5
now a is 5
change a to .. 7
now a is 7
```

Exercise 10

main.c

```c
#include <stdio.h>
int get_sum_and_diff(int a, int b, int * sum_ptr, int * diff_ptr);

int main(void) {
    int a, b;
    scanf("%d %d", &a, &b);
    get_sum_and_diff(a, b, &a, &b);
    printf("sum is : %d\n", a);
    printf("diff is : %d\n", b);
    return 0;
}

int get_sum_and_diff(int a, int b, int * sum_ptr, int * diff_ptr){
    int x, y;
    x = a;
    y = b;
    *sum_ptr=x+y;
    if(x-y>0) *diff_ptr=x-y;
    else *diff_ptr=y-x;
    return 0;
}
```

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main
15 20
sum is : 35
diff is : 5
```