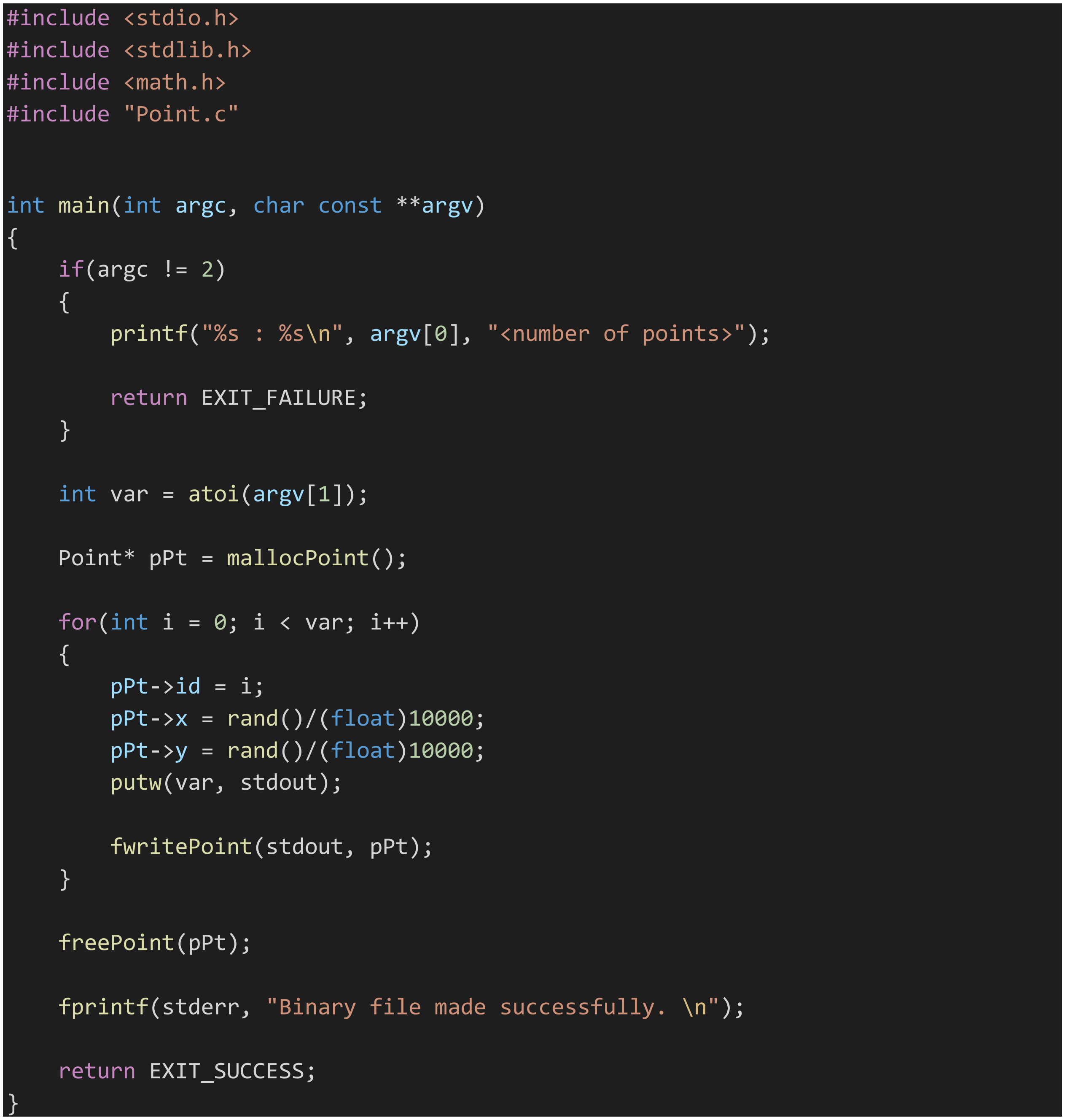
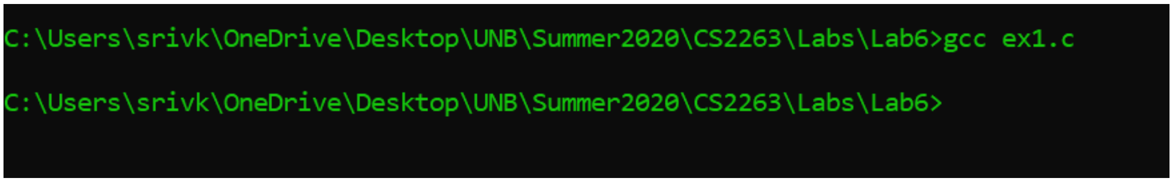
Exercise 1

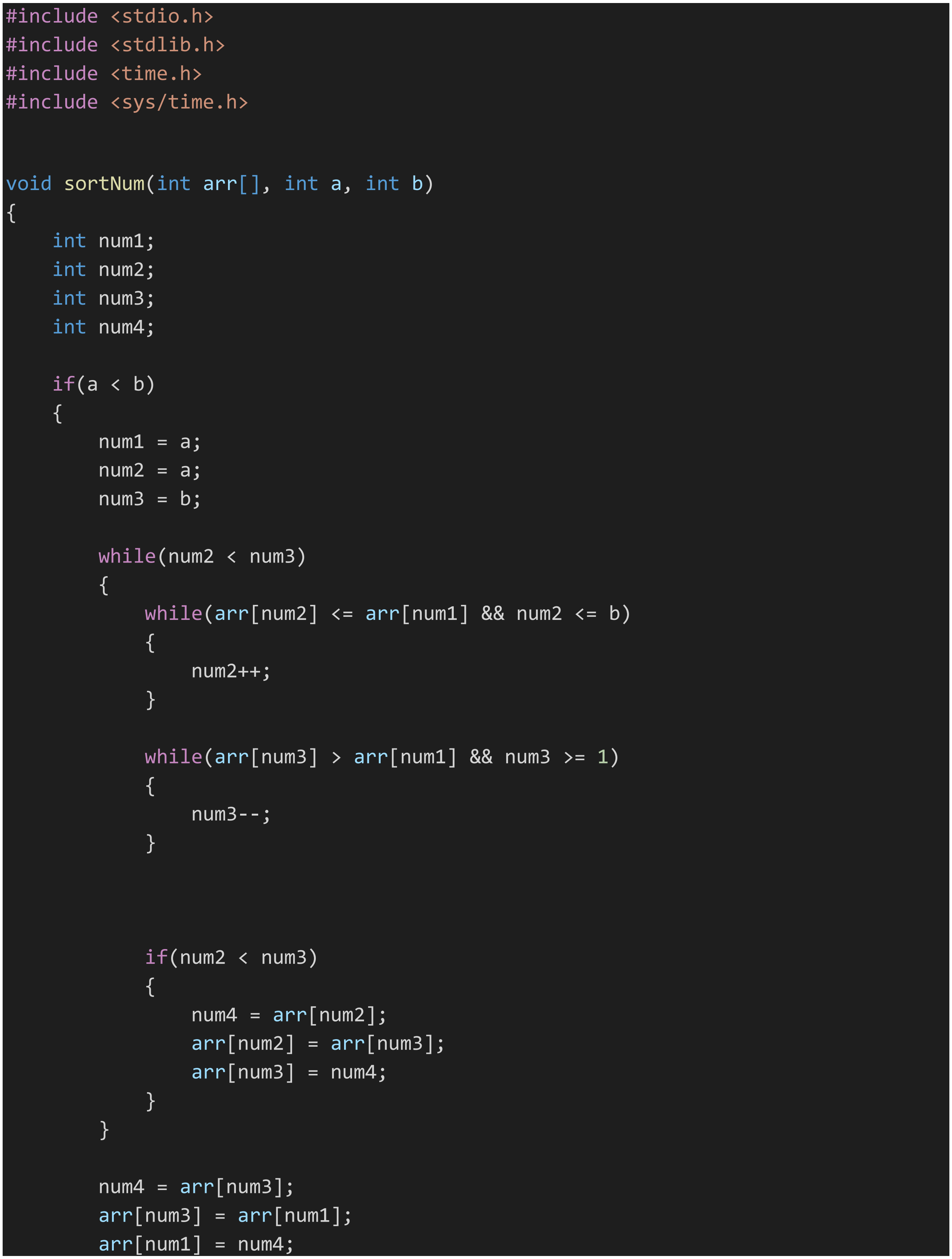


```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
#include "Point.c"


int main(int argc, char const **argv)
{
    if(argc != 2)
    {
        printf("%s : %s\n", argv[0], "<number of points>");

        return EXIT_FAILURE;
    }

    int var = atoi(argv[1]);

    Point* pPt = mallocPoint();

    for(int i = 0; i < var; i++)
    {
        pPt->id = i;
        pPt->x = rand()/(float)10000;
        pPt->y = rand()/(float)10000;
        putw(var, stdout);

        fwritePoint(stdout, pPt);
    }

    freePoint(pPt);

    fprintf(stderr, "Binary file made successfully. \n");

    return EXIT_SUCCESS;
}
```



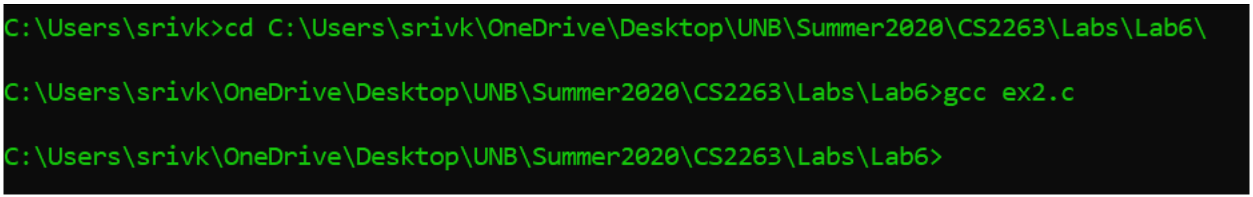
```
C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>gcc ex1.c

C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>
```

Exercise 2

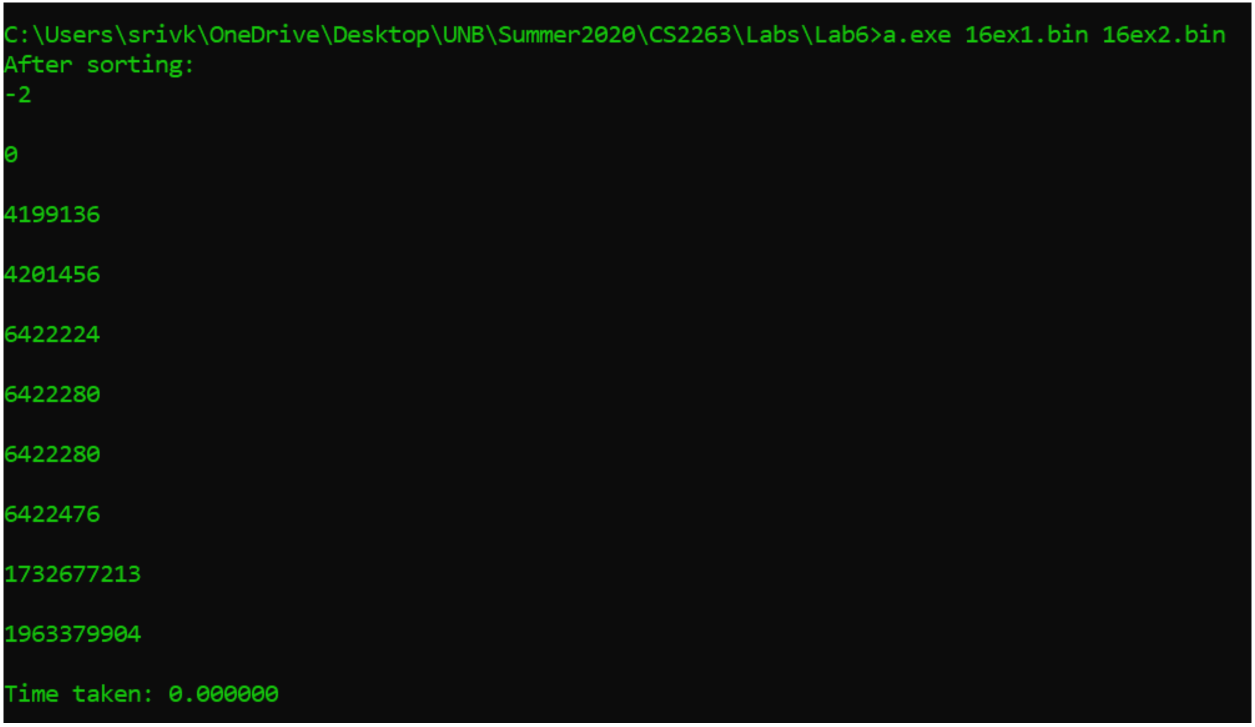


```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include <sys/time.h>


void sortNum(int arr[], int a, int b)
{
    int num1;
    int num2;
    int num3;
    int num4;

    if(a < b)
    {
        num1 = a;
        num2 = a;
        num3 = b;

        while(num2 < num3)
        {
            while(arr[num2] <= arr[num1] && num2 <= b)
            {
                num2++;
            }

            while(arr[num3] > arr[num1] && num3 >= 1)
            {
                num3--;
            }



            if(num2 < num3)
            {
                num4 = arr[num2];
                arr[num2] = arr[num3];
                arr[num3] = num4;
            }
        }

        num4 = arr[num3];
        arr[num3] = arr[num1];
        arr[num1] = num4;
        sortNum(arr, 1, num3-1);

        sortNum(arr, num3+1, b);
    }
}


int main(int argc, char** argv)
{
    struct timeval start;
    struct timeval end;

    float done;

    gettimeofday(&start, NULL);

    int array[10];

    gettimeofday(&end, NULL);

    FILE *fptr1 = fopen(argv[1], "rb");
    FILE *fptr2 = fopen(argv[2], "wb");

    fread(array, sizeof(int)*10, 1, fptr1);

    sortNum(array, 0, 9);

    printf("After sorting: \n");
    for(int i = 0; i < 10; i++)
    {
        printf("%d\n", array[i]);
        printf("\n");
    }

    fread(array, sizeof(int)*10, 1, fptr2);

    done = (end.tv_sec - start.tv_sec) + 1e-6*(end.tv_usec - start.tv_usec);
    printf("Time taken: %f\n", done);

    return 0;

}
```

Screenshots:

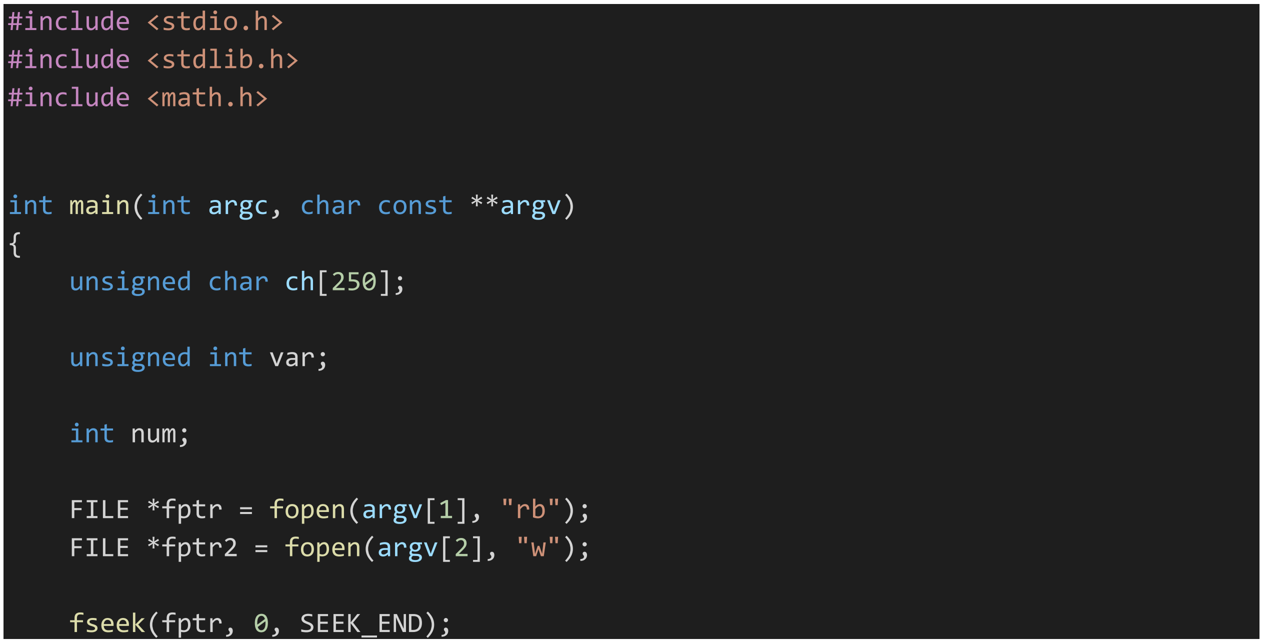


```
C:\Users\srivk>cd C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6\

C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>gcc ex2.c

C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>
```

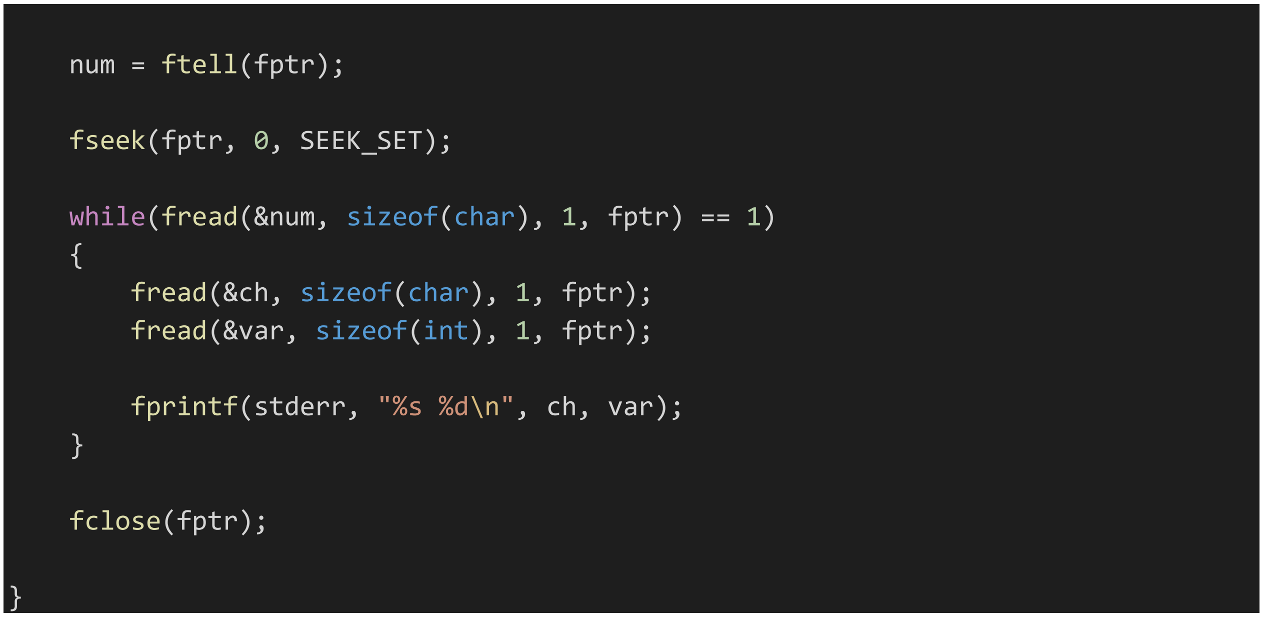


```
C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>a.exe 16ex1.bin 16ex2.bin
After sorting:
-2

0

4199136

4201456

6422224

6422280

6422280

6422476

1732677213

1963379904

Time taken: 0.000000
```

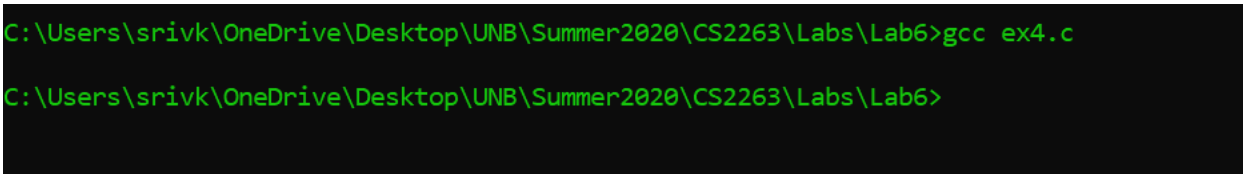
Exercise 4



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


int main(int argc, char const **argv)
{
    unsigned char ch[250];

    unsigned int var;

    int num;

    FILE *fptr = fopen(argv[1], "rb");
    FILE *fptr2 = fopen(argv[2], "w");

    fseek(fptr, 0, SEEK_END);
```



```
    num = ftell(fptr);

    fseek(fptr, 0, SEEK_SET);

    while(fread(&num, sizeof(char), 1, fptr) == 1)
    {
        fread(&ch, sizeof(char), 1, fptr);
        fread(&var, sizeof(int), 1, fptr);

        fprintf(stderr, "%s %d\n", ch, var);
    }

    fclose(fptr);

}
```



```
C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>gcc ex4.c

C:\Users\srivk\OneDrive\Desktop\UNB\Summer2020\CS2263\Labs\Lab6>
```