आत्मा राम सनातन धर्म महाविद्यालय

Atma Ram Sanatan Dharma College

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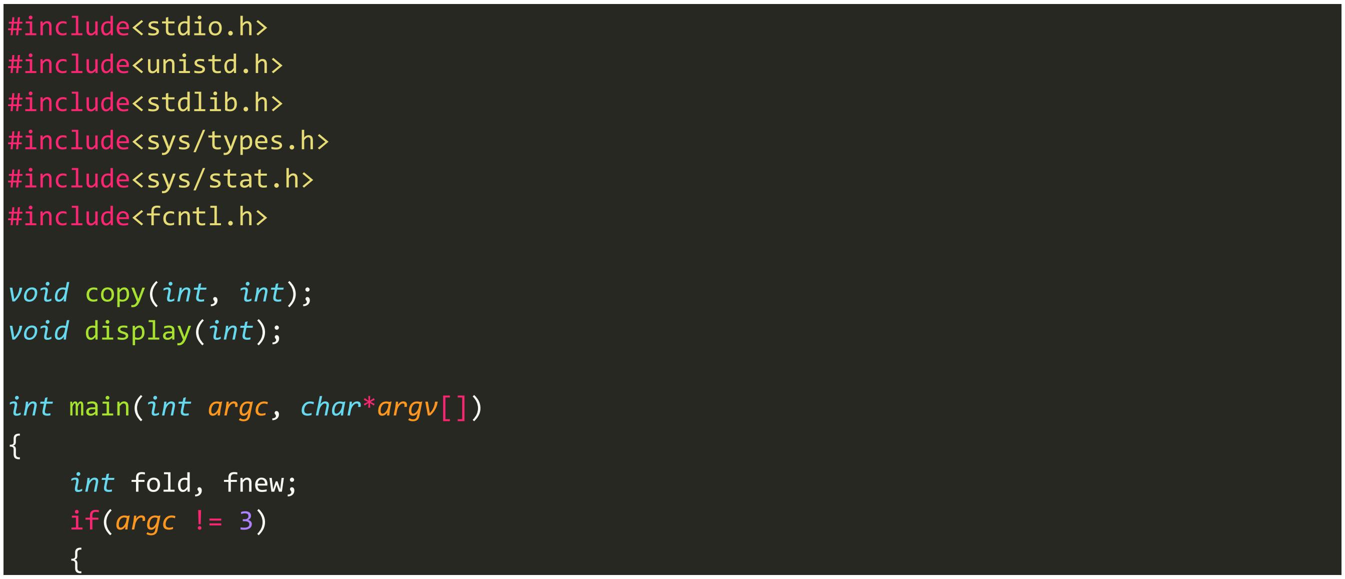
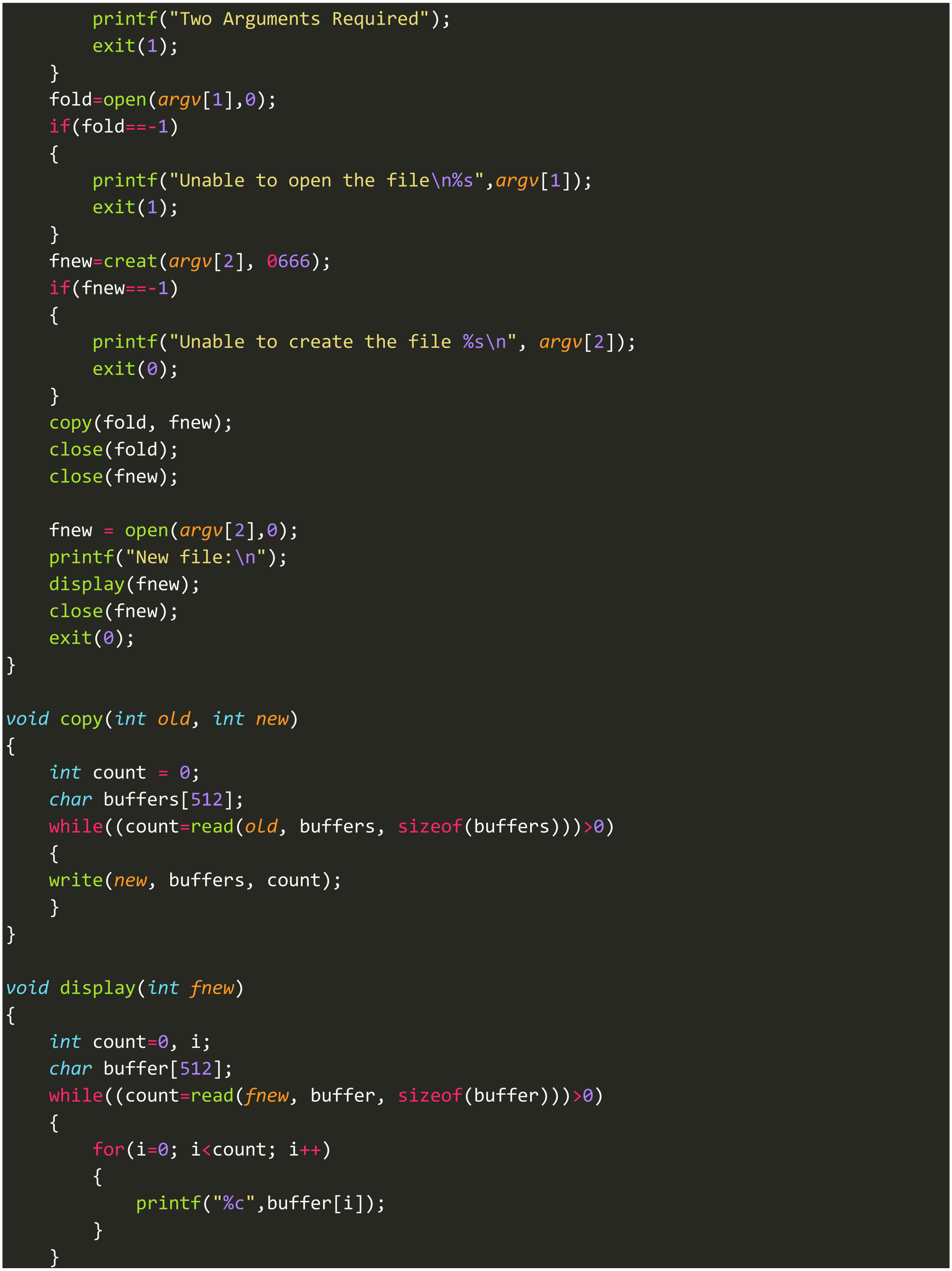
Q5. Write a program to copy files using system calls.

Answer

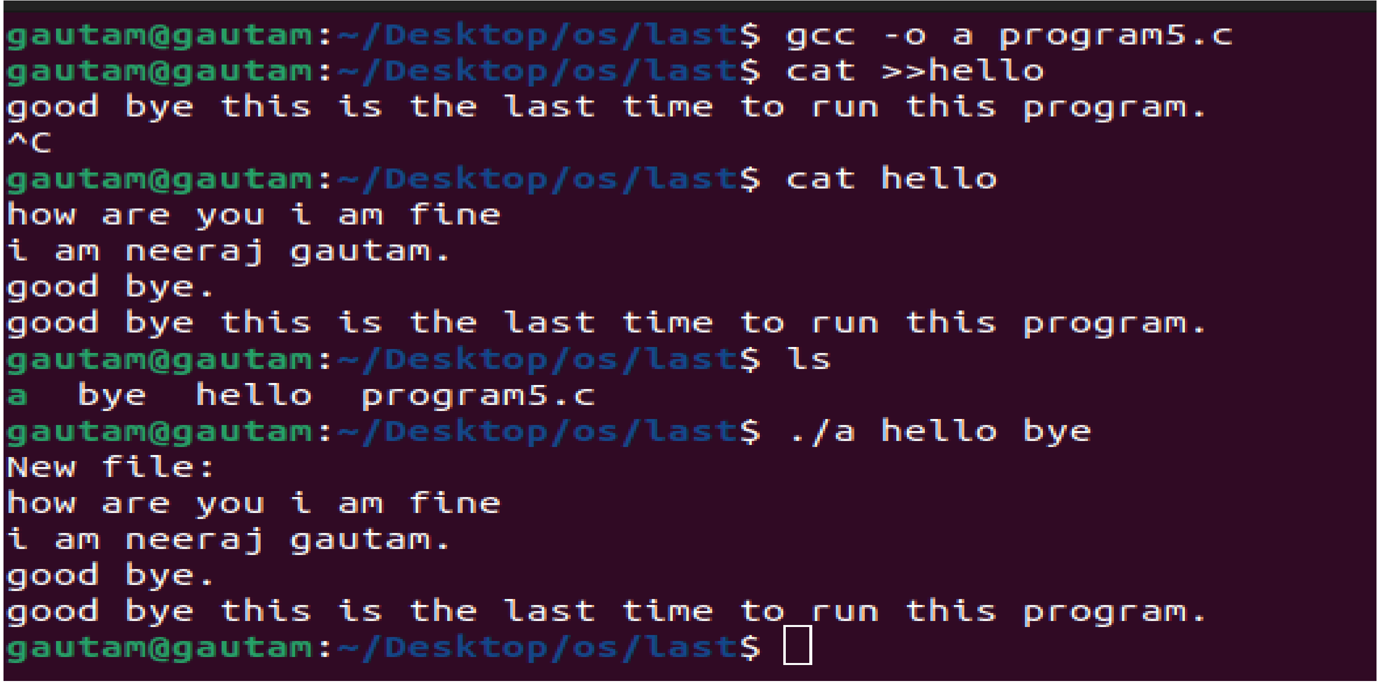


```c
#include<stdio.h>
#include<unistd.h>
#include<stdlib.h>
#include<sys/types.h>
#include<sys/stat.h>
#include<fcntl.h>

void copy(int, int);
void display(int);

int main(int argc, char*argv[])
{
    int fold, fnew;
    if(argc != 3)
    {
```



```
        printf("Two Arguments Required");
        exit(1);
    }
    fold=open(argv[1],0);
    if(fold==-1)
    {
        printf("Unable to open the file\n%s",argv[1]);
        exit(1);
    }
    fnew=creat(argv[2], 0666);
    if(fnew==-1)
    {
        printf("Unable to create the file %s\n", argv[2]);
        exit(0);
    }
    copy(fold, fnew);
    close(fold);
    close(fnew);

    fnew = open(argv[2],0);
    printf("New file:\n");
    display(fnew);
    close(fnew);
    exit(0);
}

void copy(int old, int new)
{
    int count = 0;
    char buffers[512];
    while((count=read(old, buffers, sizeof(buffers)))>0)
    {
    write(new, buffers, count);
    }
}

void display(int fnew)
{
    int count=0, i;
    char buffer[512];
    while((count=read(fnew, buffer, sizeof(buffer)))>0)
    {
        for(i=0; i<count; i++)
        {
            printf("%c",buffer[i]);
        }
    }
    for(i=0;i<count;i++)
    {
        printf("%c",buffer[i]);
    }

}
```

Output:-

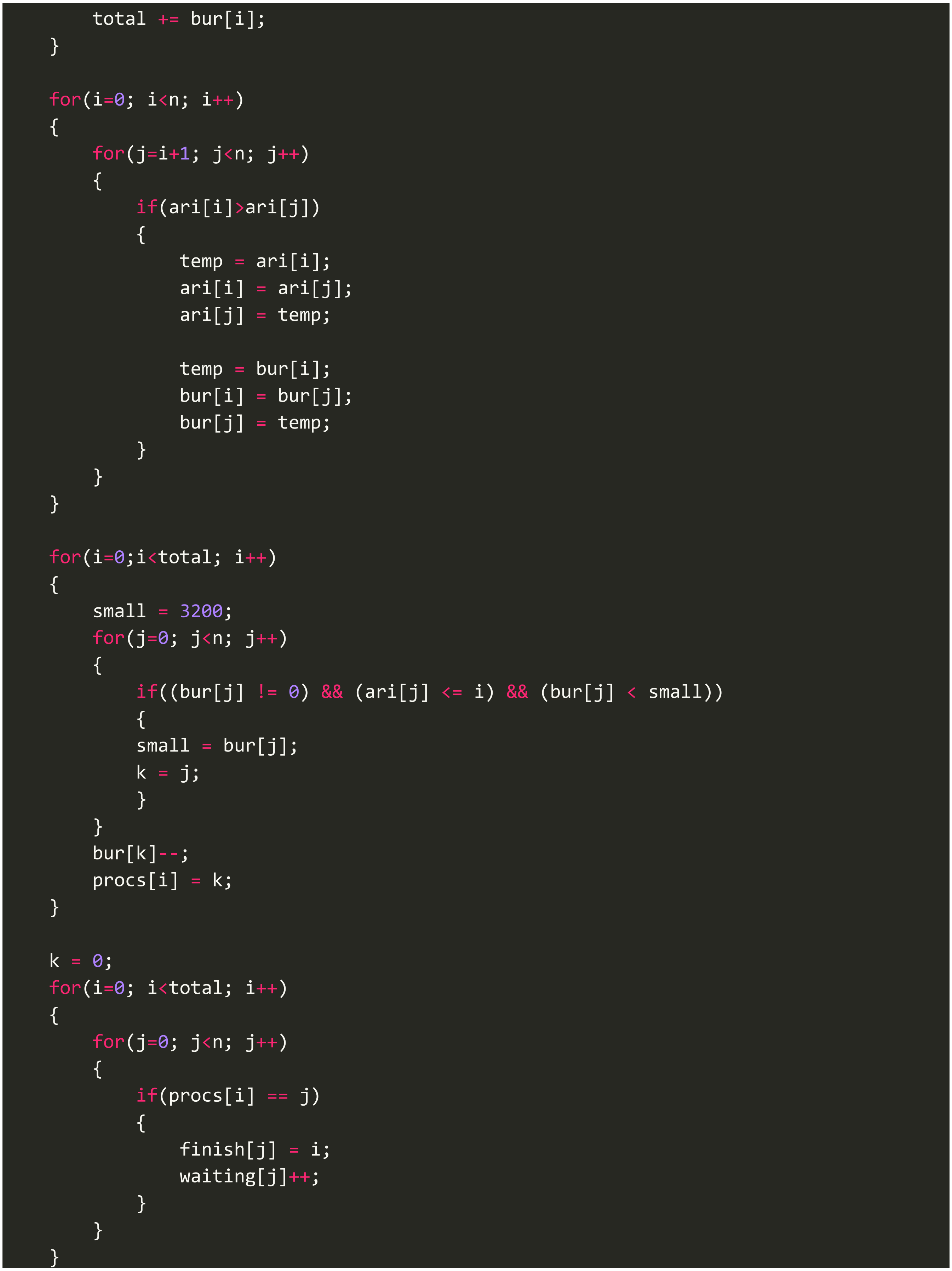


```
gautam@gautam:~/Desktop/os/last$ gcc -o a program5.c
gautam@gautam:~/Desktop/os/last$ cat >>hello
good bye this is the last time to run this program.
^C
gautam@gautam:~/Desktop/os/last$ cat hello
how are you i am fine
i am neeraj gautam.
good bye.
good bye this is the last time to run this program.
gautam@gautam:~/Desktop/os/last$ ls
a  bye  hello  program5.c
gautam@gautam:~/Desktop/os/last$ ./a hello bye
New file:
how are you i am fine
i am neeraj gautam.
good bye.
good bye this is the last time to run this program.
gautam@gautam:~/Desktop/os/last$ 
```

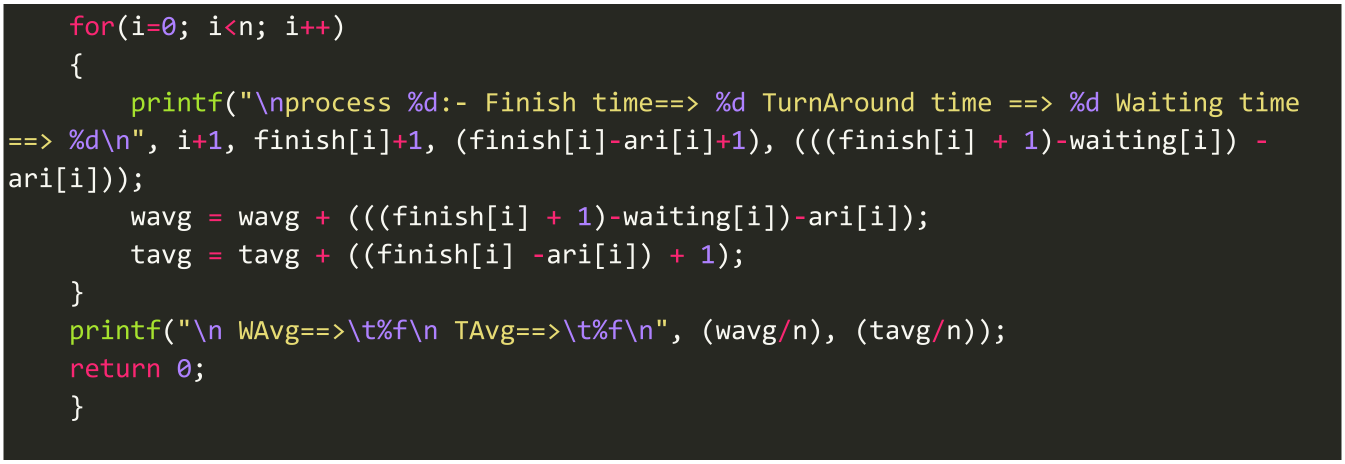
Q11 write a program to implement SRJF scheduling algorithm.

Answer

```
#include<stdio.h>

int main()
{
    int n, ari[10], bur[10], total = 0, i, j, small, temp, procs[100], k, waiting[10],
finish[10];
    float tavg=0.0, wavg=0.0;
    printf("Enter the number of process: ");
    scanf("%d", &n);
    for(i = 0; i<n; i++)
    {
        printf("Enter the arrival time of process %d:\t", i);
        scanf("%d", &ari[i]);
        printf("Enter the burst time of process %d:\t",i);
        scanf("%d", &bur[i]);
        waiting[i] = 0;
```

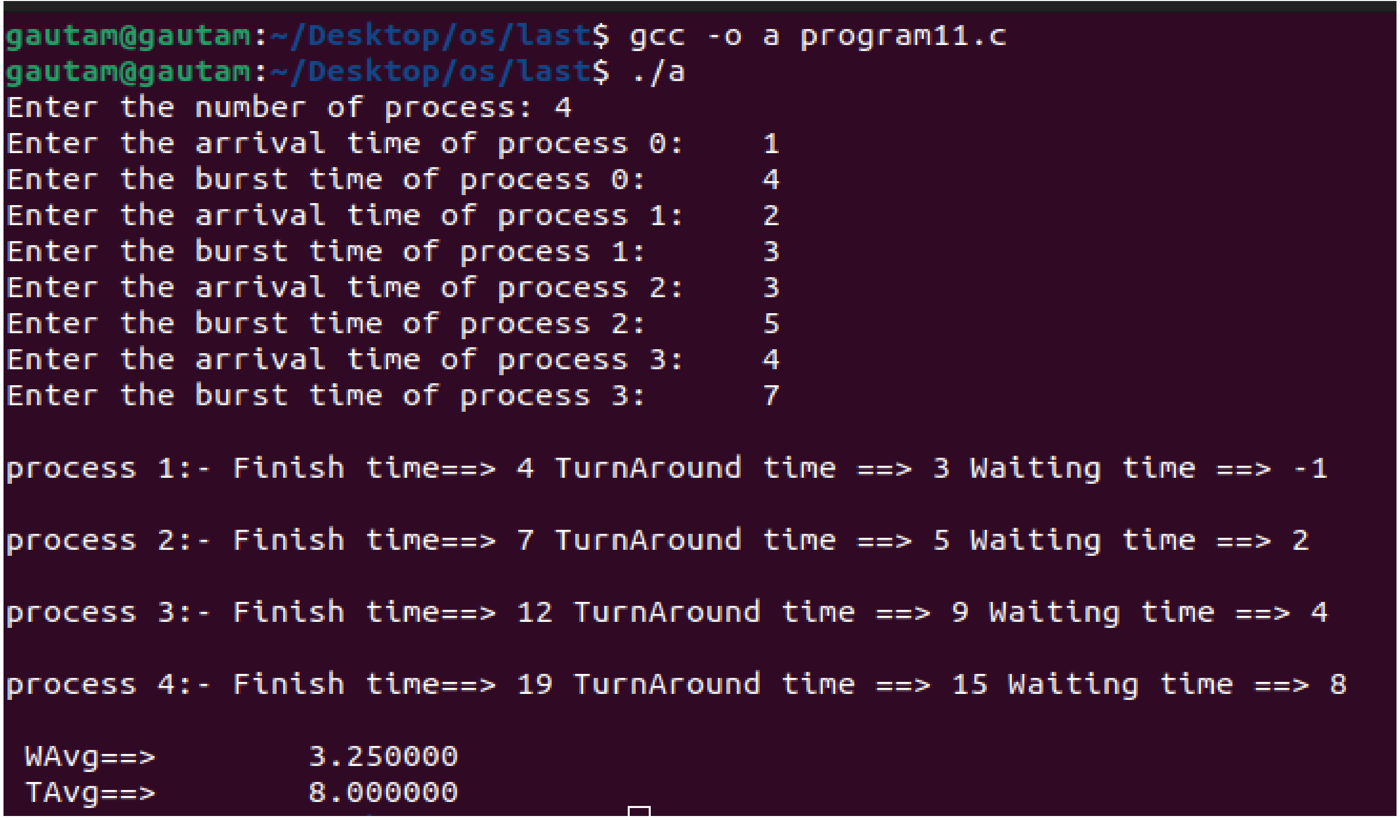


```
        total += bur[i];
    }

    for(i=0; i<n; i++)
    {
        for(j=i+1; j<n; j++)
        {
            if(ari[i]>ari[j])
            {
                temp = ari[i];
                ari[i] = ari[j];
                ari[j] = temp;

                temp = bur[i];
                bur[i] = bur[j];
                bur[j] = temp;
            }
        }
    }

    for(i=0;i<total; i++)
    {
        small = 3200;
        for(j=0; j<n; j++)
        {
            if((bur[j] != 0) && (ari[j] <= i) && (bur[j] < small))
            {
            small = bur[j];
            k = j;
            }
        }
        bur[k]--;
        procs[i] = k;
    }

    k = 0;
    for(i=0; i<total; i++)
    {
        for(j=0; j<n; j++)
        {
            if(procs[i] == j)
            {
                finish[j] = i;
                waiting[j]++;
            }
        }
    }
```



```
    for(i=0; i<n; i++)
    {
        printf("\nprocess %d:- Finish time==> %d TurnAround time ==> %d Waiting time
==> %d\n", i+1, finish[i]+1, (finish[i]-ari[i]+1), (((finish[i] + 1)-waiting[i]) -
ari[i]));
        wavg = wavg + (((finish[i] + 1)-waiting[i])-ari[i]);
        tavg = tavg + ((finish[i] -ari[i]) + 1);
    }
    printf("\n WAvg==>\t%f\n TAvg==>\t%f\n", (wavg/n), (tavg/n));
    return 0;
    }
```

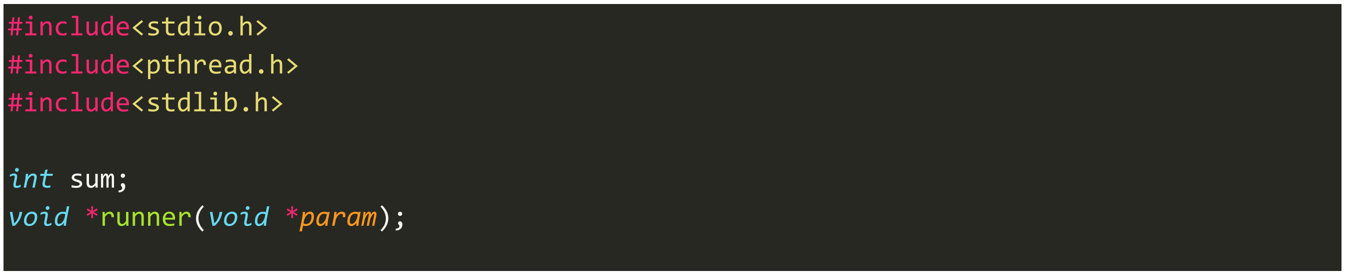
Output:-



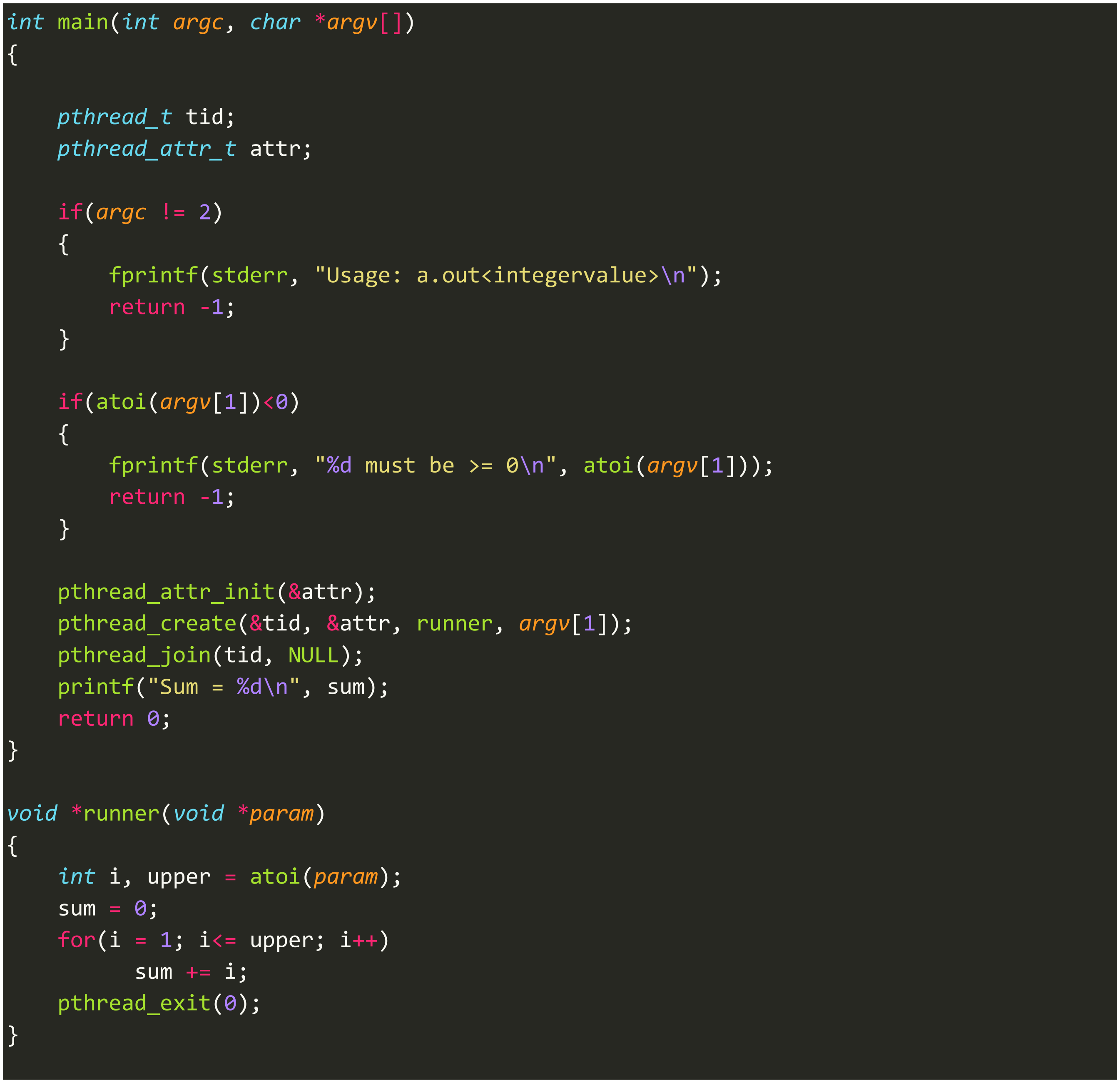
```
gautam@gautam:~/Desktop/os/last$ gcc -o a program11.c
gautam@gautam:~/Desktop/os/last$ ./a
Enter the number of process: 4
Enter the arrival time of process 0:    1
Enter the burst time of process 0:      4
Enter the arrival time of process 1:    2
Enter the burst time of process 1:      3
Enter the arrival time of process 2:    3
Enter the burst time of process 2:      5
Enter the arrival time of process 3:    4
Enter the burst time of process 3:      7

process 1:- Finish time==> 4 TurnAround time ==> 3 Waiting time ==> -1

process 2:- Finish time==> 7 TurnAround time ==> 5 Waiting time ==> 2

process 3:- Finish time==> 12 TurnAround time ==> 9 Waiting time ==> 4

process 4:- Finish time==> 19 TurnAround time ==> 15 Waiting time ==> 8

 WAvg==>        3.250000
 TAvg==>        8.000000
```

Q12 write a program to calculate sum of n numbers using thread library.

Answer

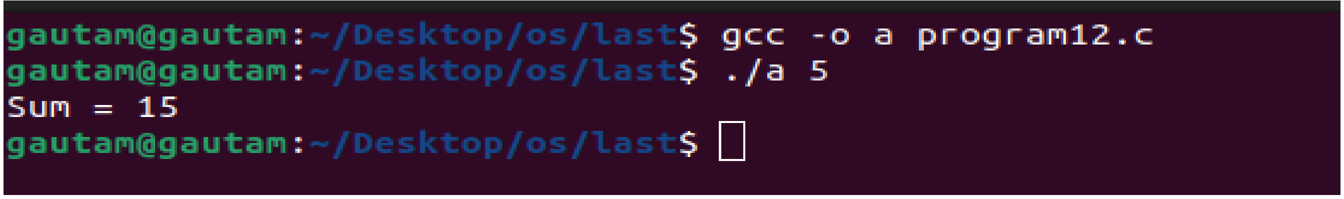


```
#include<stdio.h>
#include<pthread.h>
#include<stdlib.h>

int sum;
void *runner(void *param);
```



```c
int main(int argc, char *argv[])
{

    pthread_t tid;
    pthread_attr_t attr;

    if(argc != 2)
    {
        fprintf(stderr, "Usage: a.out<integervalue>\n");
        return -1;
    }

    if(atoi(argv[1])<0)
    {
        fprintf(stderr, "%d must be >= 0\n", atoi(argv[1]));
        return -1;
    }

    pthread_attr_init(&attr);
    pthread_create(&tid, &attr, runner, argv[1]);
    pthread_join(tid, NULL);
    printf("Sum = %d\n", sum);
    return 0;
}

void *runner(void *param)
{
    int i, upper = atoi(param);
    sum = 0;
    for(i = 1; i<= upper; i++)
          sum += i;
    pthread_exit(0);
}
```

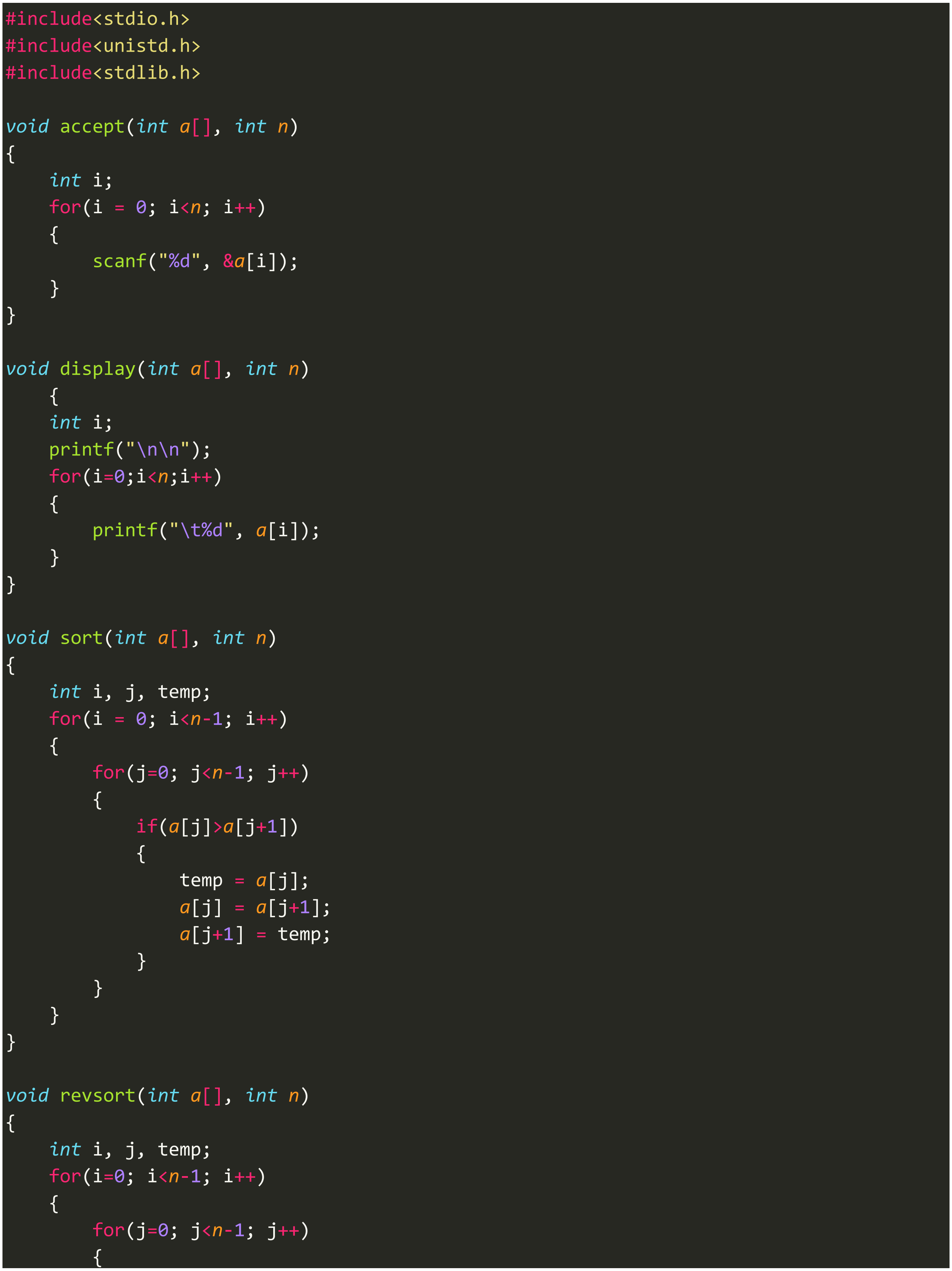
Output:-



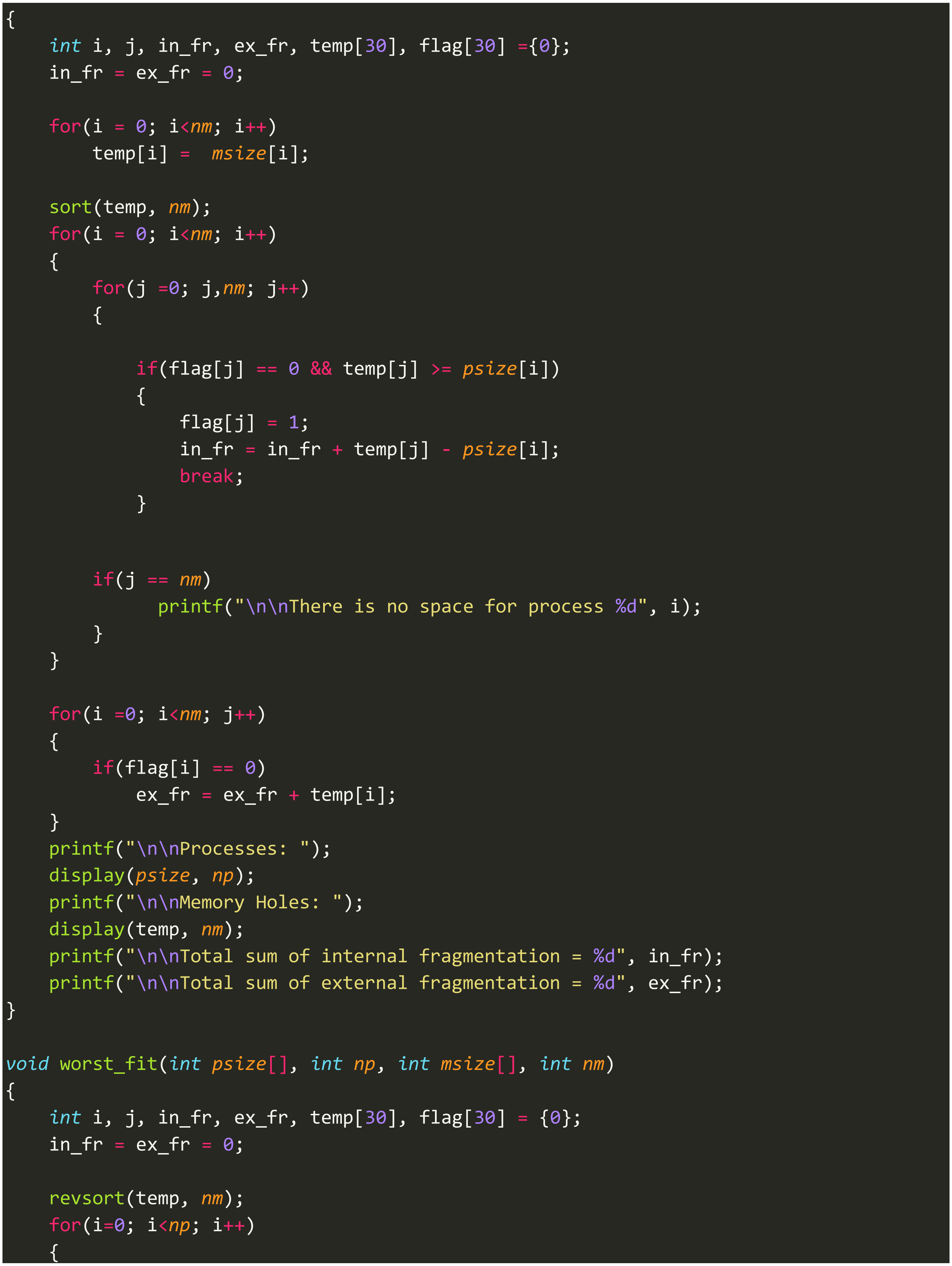
```
gautam@gautam:~/Desktop/os/last$ gcc -o a program12.c
gautam@gautam:~/Desktop/os/last$ ./a 5
Sum = 15
gautam@gautam:~/Desktop/os/last$ 
```

Q13 write a program to implement first-fit, best-fit and worst-fit allocation strategies.

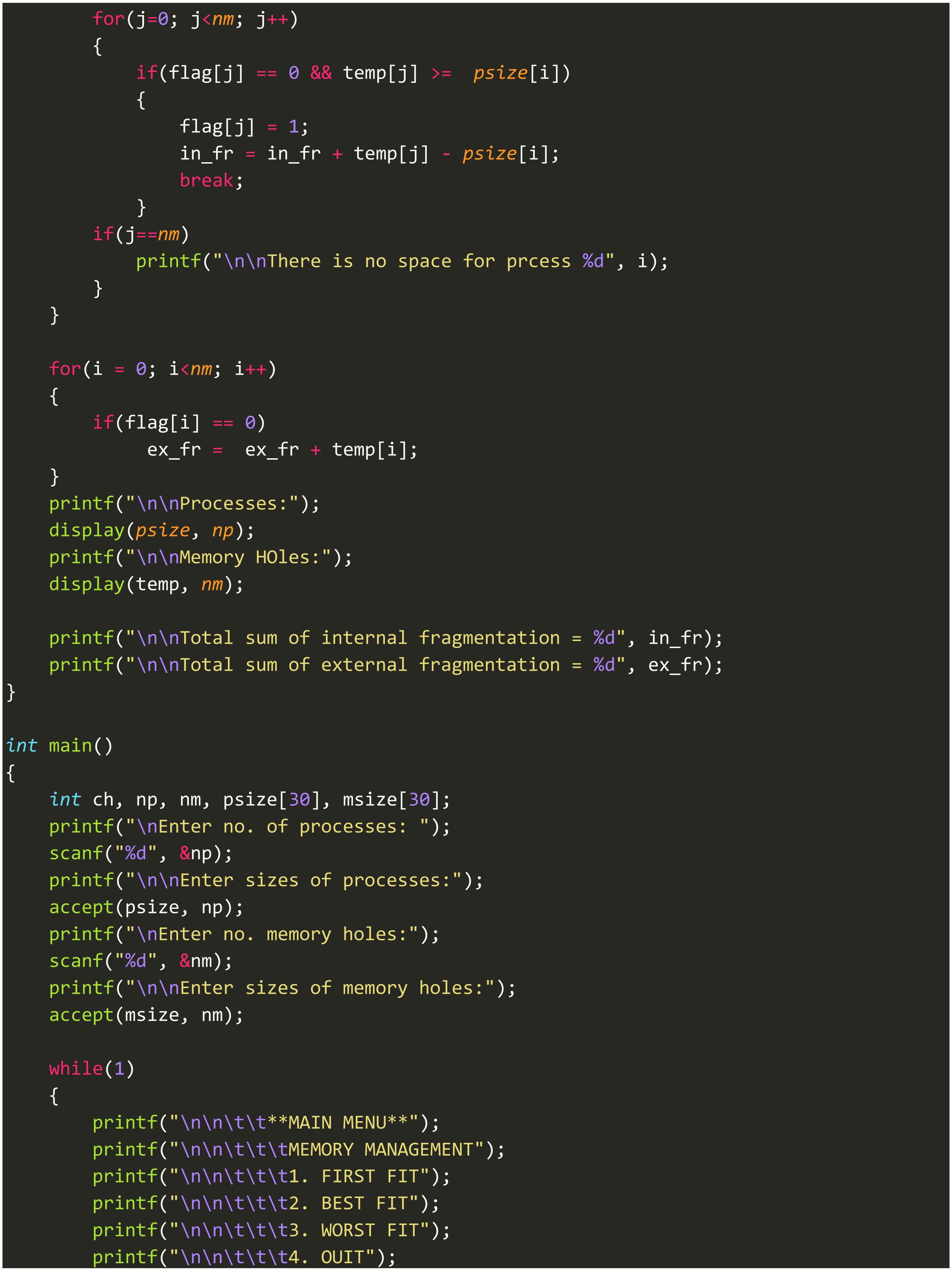
Answer



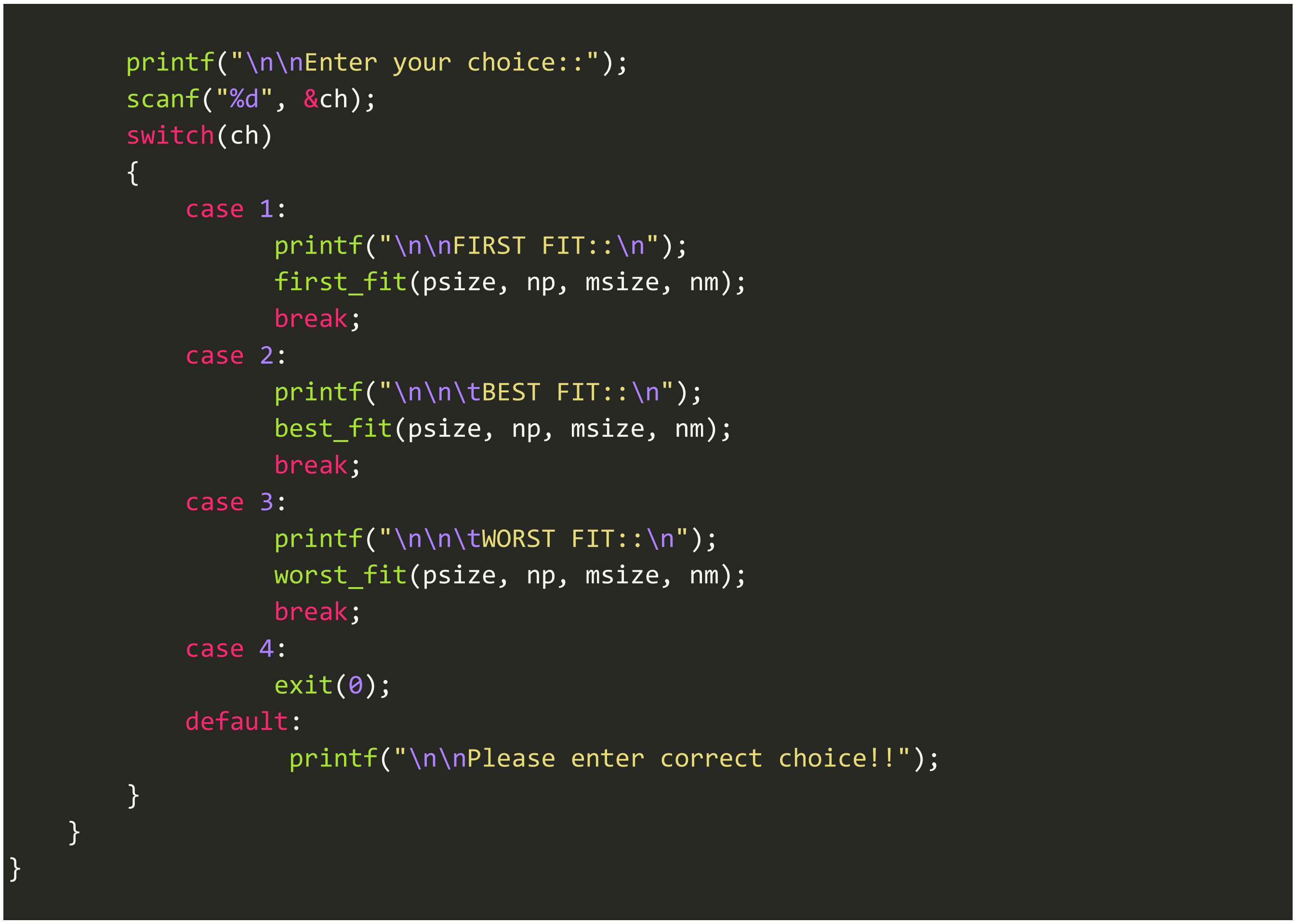
```
#include<stdio.h>
#include<unistd.h>
#include<stdlib.h>

void accept(int a[], int n)
{
    int i;
    for(i = 0; i<n; i++)
    {
        scanf("%d", &a[i]);
    }
}

void display(int a[], int n)
    {
    int i;
    printf("\n\n");
    for(i=0;i<n;i++)
    {
        printf("\t%d", a[i]);
    }
}

void sort(int a[], int n)
{
    int i, j, temp;
    for(i = 0; i<n-1; i++)
    {
        for(j=0; j<n-1; j++)
        {
            if(a[j]>a[j+1])
            {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
}

void revsort(int a[], int n)
{
    int i, j, temp;
    for(i=0; i<n-1; i++)
    {
        for(j=0; j<n-1; j++)
        {
            if(a[j]<a[j+1])
            {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
}

void first_fit(int psize[], int np, int msize[], int nm)
{
    int i, j, in_fr, ex_fr, flag[30]={0};
    in_fr = ex_fr = 0;

    for(i=0; i<np; i++)
    {
        for(j=0; j<nm; j++)
        {
            if(flag[j] == 0 && msize[j] >= psize[i])
            {
                flag[j] = 1;
                in_fr = in_fr+msize[j]-psize[i];
                break;
            }


        if(j==nm)
             printf("\n\nThere is no space for process %d", i);
        }
    }

    for(i = 0; i<nm; i++)
    {
        if(flag[i] == 0)
            ex_fr = ex_fr + msize[i];
    }

    printf("\n\nProcesses: ");
    display(psize, np);
    printf("\n\nMemory Holes: ");
    display(msize, nm);
    printf("\n\nTotal sum of internal fragmentation = %d", in_fr);
    printf("\n\nTotal sum of external fragmentation = %d", ex_fr);
}

void best_fit(int psize[], int np, int msize[], int nm)
```



```
{
    int i, j, in_fr, ex_fr, temp[30], flag[30] ={0};
    in_fr = ex_fr = 0;

    for(i = 0; i<nm; i++)
        temp[i] =  msize[i];

    sort(temp, nm);
    for(i = 0; i<nm; i++)
    {
        for(j =0; j,nm; j++)
        {

            if(flag[j] == 0 && temp[j] >= psize[i])
            {
                flag[j] = 1;
                in_fr = in_fr + temp[j] - psize[i];
                break;
            }


        if(j == nm)
              printf("\n\nThere is no space for process %d", i);
        }
    }

    for(i =0; i<nm; j++)
    {
        if(flag[i] == 0)
            ex_fr = ex_fr + temp[i];
    }
    printf("\n\nProcesses: ");
    display(psize, np);
    printf("\n\nMemory Holes: ");
    display(temp, nm);
    printf("\n\nTotal sum of internal fragmentation = %d", in_fr);
    printf("\n\nTotal sum of external fragmentation = %d", ex_fr);
}

void worst_fit(int psize[], int np, int msize[], int nm)
{
    int i, j, in_fr, ex_fr, temp[30], flag[30] = {0};
    in_fr = ex_fr = 0;

    revsort(temp, nm);
    for(i=0; i<np; i++)
    {
```

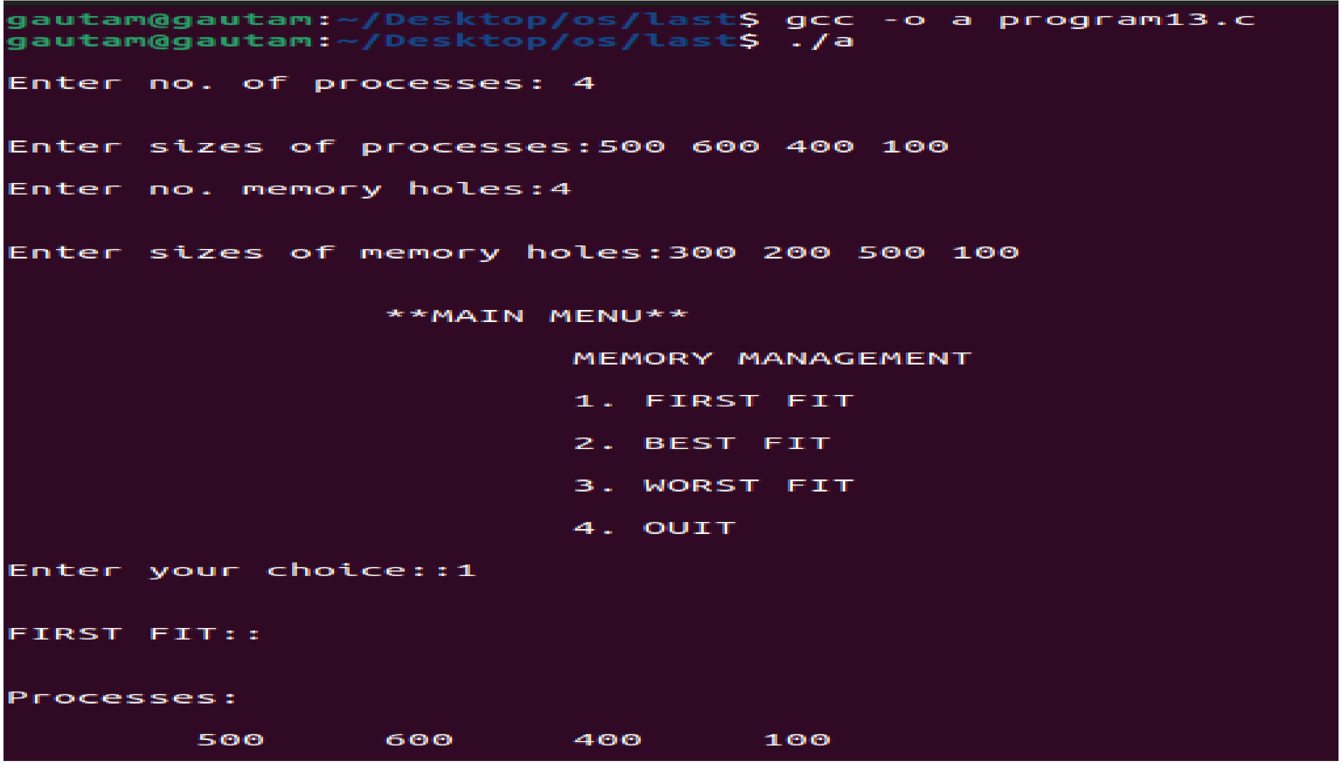


```
        for(j=0; j<nm; j++)
        {
            if(flag[j] == 0 && temp[j] >=  psize[i])
            {
                flag[j] = 1;
                in_fr = in_fr + temp[j] - psize[i];
                break;
            }
        if(j==nm)
            printf("\n\nThere is no space for prcess %d", i);
        }
    }

    for(i = 0; i<nm; i++)
    {
        if(flag[i] == 0)
             ex_fr =  ex_fr + temp[i];
    }
    printf("\n\nProcesses:");
    display(psize, np);
    printf("\n\nMemory HOles:");
    display(temp, nm);

    printf("\n\nTotal sum of internal fragmentation = %d", in_fr);
    printf("\n\nTotal sum of external fragmentation = %d", ex_fr);
}

int main()
{
    int ch, np, nm, psize[30], msize[30];
    printf("\nEnter no. of processes: ");
    scanf("%d", &np);
    printf("\n\nEnter sizes of processes:");
    accept(psize, np);
    printf("\nEnter no. memory holes:");
    scanf("%d", &nm);
    printf("\n\nEnter sizes of memory holes:");
    accept(msize, nm);

    while(1)
    {
        printf("\n\n\t\t**MAIN MENU**");
        printf("\n\n\t\t\tMEMORY MANAGEMENT");
        printf("\n\n\t\t\t1. FIRST FIT");
        printf("\n\n\t\t\t2. BEST FIT");
        printf("\n\n\t\t\t3. WORST FIT");
        printf("\n\n\t\t\t4. QUIT");
```

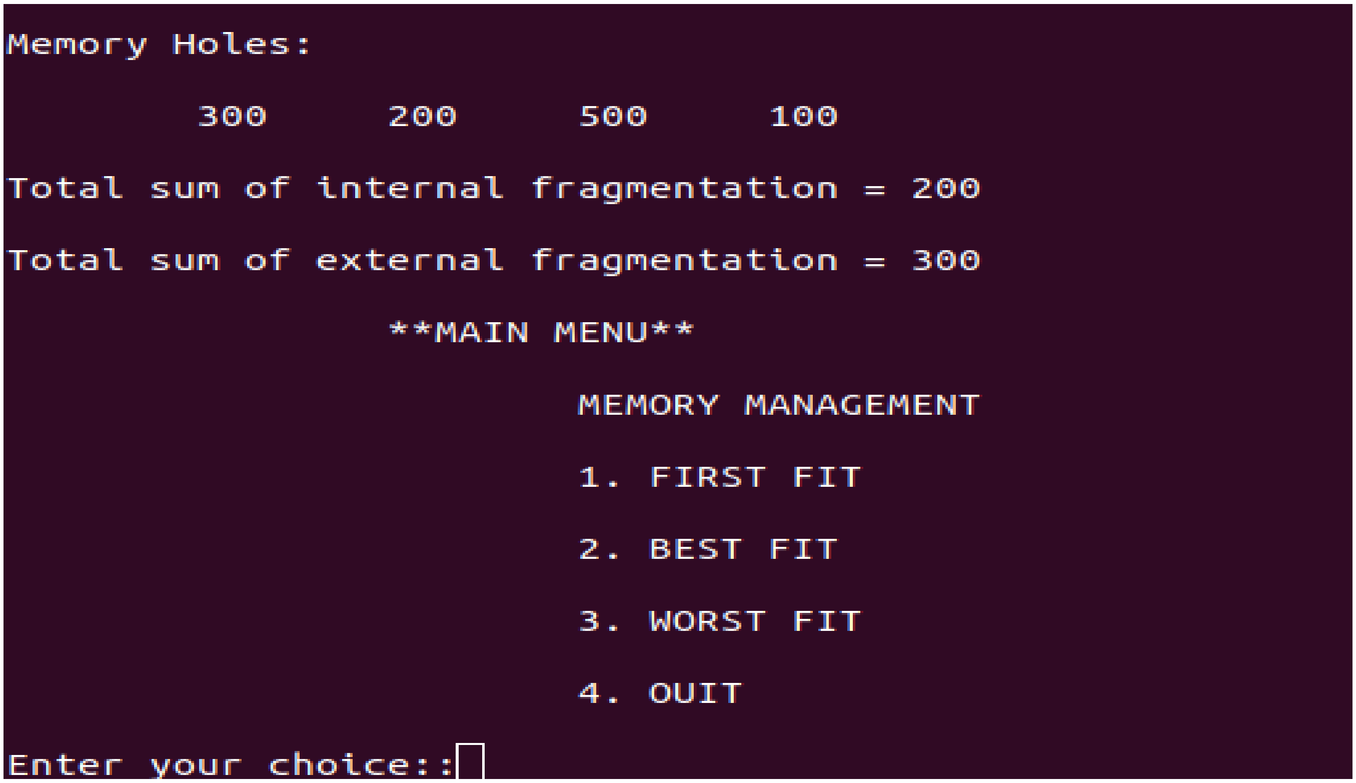


```
        printf("\n\nEnter your choice::");
        scanf("%d", &ch);
        switch(ch)
        {
            case 1:
                  printf("\n\nFIRST FIT::\n");
                  first_fit(psize, np, msize, nm);
                  break;
            case 2:
                  printf("\n\n\tBEST FIT::\n");
                  best_fit(psize, np, msize, nm);
                  break;
            case 3:
                  printf("\n\n\tWORST FIT::\n");
                  worst_fit(psize, np, msize, nm);
                  break;
            case 4:
                  exit(0);
            default:
                   printf("\n\nPlease enter correct choice!!");
        }
    }
}
```

Output:-



```
gautam@gautam:~/Desktop/os/last$ gcc -o a program13.c
gautam@gautam:~/Desktop/os/last$ ./a

Enter no. of processes: 4

Enter sizes of processes:500 600 400 100
Enter no. memory holes:4

Enter sizes of memory holes:300 200 500 100

                **MAIN MENU**
                        MEMORY MANAGEMENT
                        1. FIRST FIT
                        2. BEST FIT
                        3. WORST FIT
                        4. QUIT
Enter your choice::1

FIRST FIT::

Processes:
        500     600     400     100
```



```
Memory Holes:

        300     200     500     100

Total sum of internal fragmentation = 200

Total sum of external fragmentation = 300

                **MAIN MENU**

                        MEMORY MANAGEMENT

                        1. FIRST FIT

                        2. BEST FIT

                        3. WORST FIT

                        4. OUIT

Enter your choice::
```