Student Name: Venkata Srikar Korlepara
Student ID: 11606884
Email Address: srikar.k.v.20@gmail.com
GitHub Link:
Code: Question no. 2

```
#include<stdio.h>
#include<unistd.h>
#include<stdlib.h>
#include<malloc.h>
#include<time.h>
#include<pthread.h>
#include<semaphore.h>
struct Process {
 int time,Atime,Btime,id;
 clock_t arrival;
 int flag,completed,p;
 sem_t se;
 struct Process *next;
 int priority;
 int WT;
};
int i=0,k=0;
typedef struct Process node;
clock_t start;
float A_TAT=0,A_WT=0;
node *Sp1=NULL,*Sp2=NULL,*temp;
void *processor(node *S) {
 clock_t count;
 while(1) {
        sem_wait(&S->se);
        if((S->Atime<=(clock()-start)/CLOCKS_PER_SEC && S-
>p==1)) {
                S->p=0;
                count=clock();
        }
```

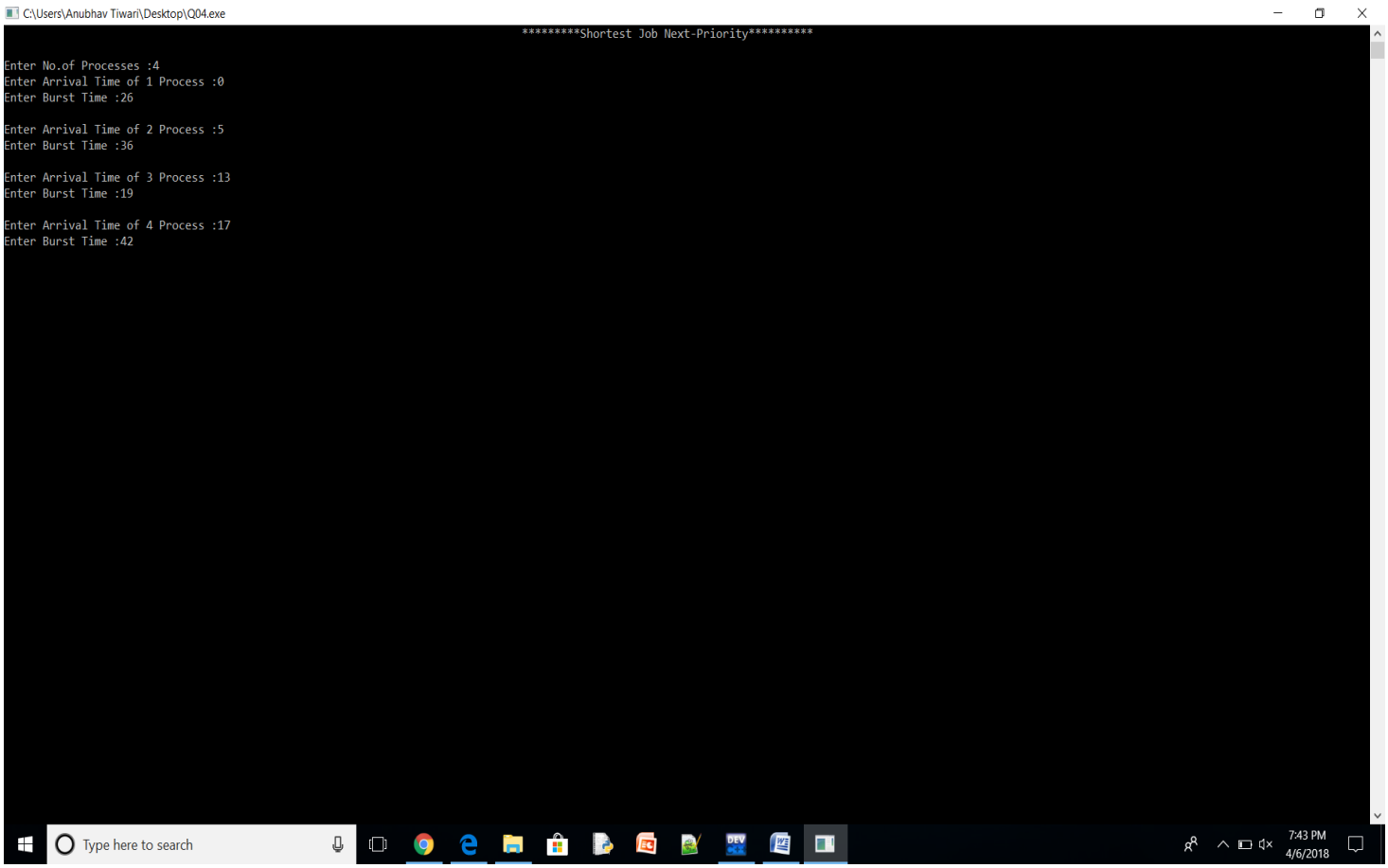
```
        if(S->flag==1) {
                printf("\nProcess-%d Running \nTimer :%d",S-
>id,(clock()-start)/CLOCKS_PER_SEC);
                S->flag=0;
                S->arrival=clock();
        }
        if((clock()-count)/CLOCKS_PER_SEC==1) {
                count=clock();
                printf("\nTimer :%d",(clock()-
start)/CLOCKS_PER_SEC);
                S->time-=1;
                if(S->time==0) {
                        S->WT=((clock()-start)/CLOCKS_PER_SEC)-S-
>Btime-S->Atime;
                        A_TAT+=(clock()-start)/CLOCKS_PER_SEC-S-
>Atime;
                        A_WT+=((clock()-start)/CLOCKS_PER_SEC)-S-
>Btime-S->Atime;
                        sleep(2);
                        node *start=Sp2;
                        while(start!=NULL) {
                                if(start->next==S) {
                                        start->next=S->next;
                                        break;
                                }
                                if(Sp2==S) {
                                        Sp2=Sp2->next;
                                        break;
                                }
                                start=start->next;
                        }
                        printf("\nProcess-%d Completed ",S->id);
                        if(Sp2!=NULL){
                                printf("next Process-%d",Sp2->id);
                        }
```

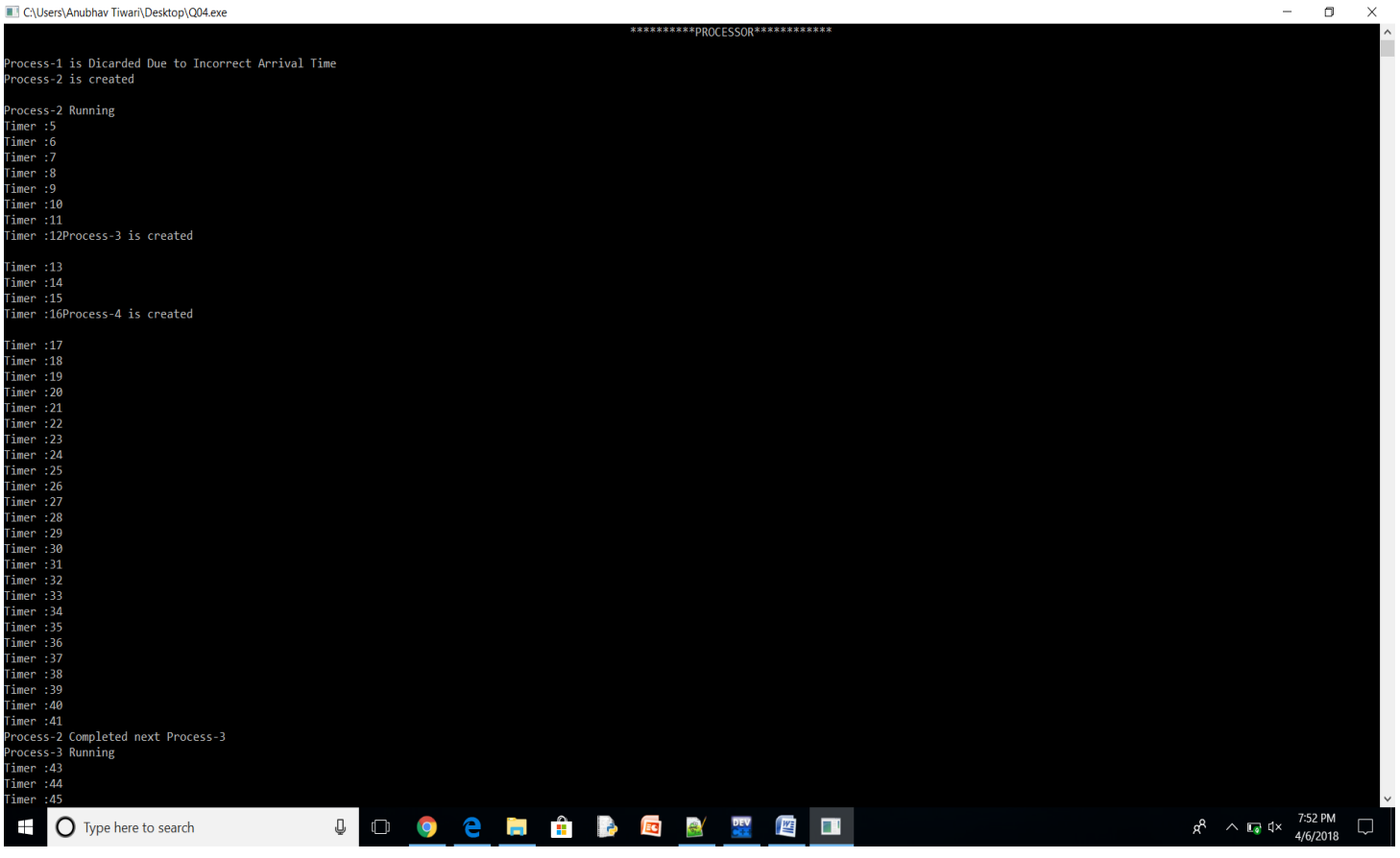
```
                        S->completed=7;
                        if(Sp2!=NULL){
                                sem_post(&Sp2->se);
                        }
                }
                }
                                if(S->completed==7) {
                break;
        }
 sem_post(&S->se);
 }
}
void spush(node *temp) {
 int k;
 node *start=Sp2;
 k=temp->priority;
 k=1+(temp->WT/temp->time);
 if(Sp2==NULL) {
        Sp2=temp;
        Sp2->next=NULL;
 }
 else{
 int t=temp->time;
 if(start->priority<k){
        temp->next = Sp2;
      Sp2=temp;
 }
 else if (start->time > t) {
        temp->next = Sp2;
        Sp2=temp;
        }
   else {
        while (start->next != NULL && start->next->time< t) {
                        start = start->next;
        }
```

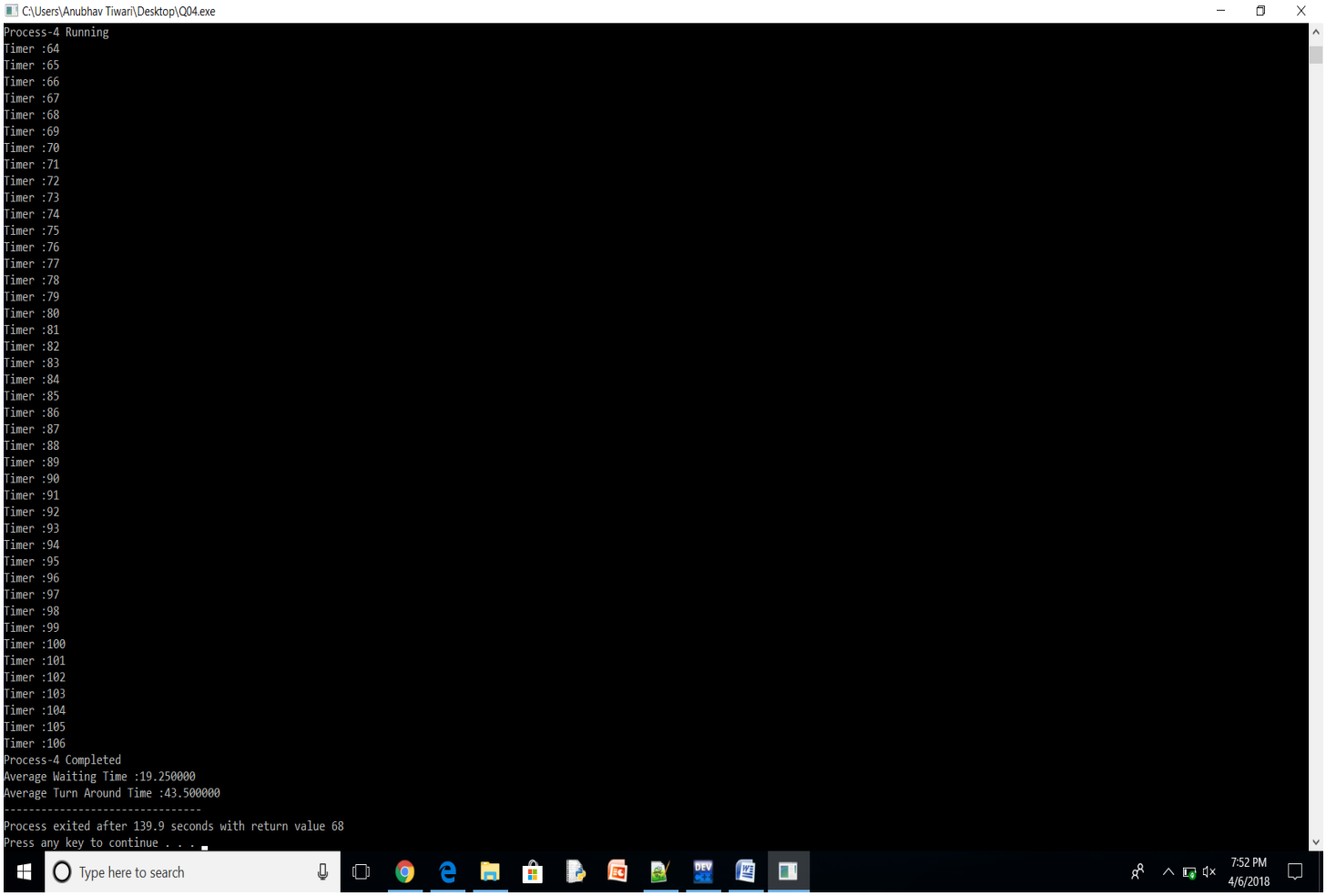
```
        temp->next = start->next;
        start->next = temp;
    }
  }
}
void push() {
 temp=(node *)malloc(sizeof(node));
 printf("\nEnter Arrival Time of %d Process :",(i+1));
 scanf("%d",&temp->Atime);
 printf("Enter Burst Time :");
 scanf("%d",&temp->time);
 temp->id=i+1;
 temp->p=1;
 temp->flag=1;
 temp->Btime=temp->time;
 temp->priority=1+(temp->WT/temp->time);
 sem_init(&temp->se,0,0);
 int t=temp->Atime;
 node *start=Sp1;
 if (start->Atime > t) {
          temp->next = Sp1;
          Sp1=temp;
          }
          else {
          while (start->next != NULL && start->next->Atime < t) {
                        start = start->next;
          }
        temp->next = start->next;
        start->next = temp;
    }
}
void main() {
 printf("\t\t\t\t\t\t\t\t\t*********Shortest Job Next-
Priority**********\n");
 int n,l=1;
```

```
 pthread_t p[10];
 printf("\nEnter No.of Processes :");
 scanf("%d",&n);
 while(i<n) {
        if(Sp1==NULL) {
                Sp1=(node *)malloc(sizeof(node));
                printf("Enter Arrival Time of %d Process :",(i+1));
                scanf("%d",&Sp1->Atime);
                printf("Enter Burst Time :");
                scanf("%d",&Sp1->time);
                Sp1->id=i+1;
                Sp1->flag=1;
                Sp1->p=1;
                Sp1->WT=0;
                Sp1->Btime=Sp1->time;
                Sp1->priority=1+(Sp1->WT/Sp1->time);
                sem_init(&Sp1->se,0,0);
                Sp1->next=NULL;
        }
        else {
                push();
        }
        i++;
 }
 i=0;
 system("cls");
 printf("\t\t\t\t\t\t\t\t\t\t\t\**********PROCESSOR**********\n\n")
;
 start=clock();
 while(i<n) {
        temp=Sp1;
        if(temp->Atime<=0) {
                printf("Process-%d is Dicarded Due to Incorrect Arrival
Time\n",temp->id);
                Sp1=temp->next;
```

```
                temp=Sp1;
                i++;
        }
        if(l==1) {
                        l=0;
                        sem_post(&temp->se);
                }
        if((clock()-start)/CLOCKS_PER_SEC==temp->Atime) {
        printf("Process-%d is created\n",temp->id);
                pthread_create(&p[i],NULL,processor,temp);
                Sp1=Sp1->next;
                spush(temp);
                i++;
        }}
 for(i=0;i<n;i++) {
        pthread_join(p[i],NULL);
 }
 printf("\nAverage Waiting Time :%f\nAverage Turn Around Time
:%f",(float)A_WT/n,(float)A_TAT/n);
}
```


C:\Users\Anubhav Tiwari\Desktop\Q04.exe
********Shortest Job Next-Priority*********
Enter No.of Processes :4
Enter Arrival Time of 1 Process :0
Enter Burst Time :26
Enter Arrival Time of 2 Process :5
Enter Burst Time :36
Enter Arrival Time of 3 Process :13
Enter Burst Time :19
Enter Arrival Time of 4 Process :17
Enter Burst Time :42
Type here to search
7:43 PM
4/6/2018


C:\Users\Anubhav Tiwari\Desktop\Q04.exe
*********PROCESSOR**********
Process-1 is Dicarded Due to Incorrect Arrival Time
Process-2 is created
Process-2 Running
Timer :5
Timer :6
Timer :7
Timer :8
Timer :9
Timer :10
Timer :11
Timer :12Process-3 is created
Timer :13
Timer :14
Timer :15
Timer :16Process-4 is created
Timer :17
Timer :18
Timer :19
Timer :20
Timer :21
Timer :22
Timer :23
Timer :24
Timer :25
Timer :26
Timer :27
Timer :28
Timer :29
Timer :30
Timer :31
Timer :32
Timer :33
Timer :34
Timer :35
Timer :36
Timer :37
Timer :38
Timer :39
Timer :40
Timer :41
Process-2 Completed next Process-3
Process-3 Running
Timer :43
Timer :44
Timer :45
Type here to search
7:52 PM
4/6/2018


C:\Users\Anubhav Tiwari\Desktop\Q04.exe
Process-4 Running
Timer :64
Timer :65
Timer :66
Timer :67
Timer :68
Timer :69
Timer :70
Timer :71
Timer :72
Timer :73
Timer :74
Timer :75
Timer :76
Timer :77
Timer :78
Timer :79
Timer :80
Timer :81
Timer :82
Timer :83
Timer :84
Timer :85
Timer :86
Timer :87
Timer :88
Timer :89
Timer :90
Timer :91
Timer :92
Timer :93
Timer :94
Timer :95
Timer :96
Timer :97
Timer :98
Timer :99
Timer :100
Timer :101
Timer :102
Timer :103
Timer :104
Timer :105
Timer :106
Process-4 Completed
Average Waiting Time :19.250000
Average Turn Around Time :43.500000

Process exited after 139.9 seconds with return value 68
Press any key to continue . . .
Type here to search
7:52 PM
4/6/2018