

EXPERIMENT NO. 1

Name:Karan Santosh Salunkhe

Roll no:73

Branch:AIDS

Batch:A4

1) C++ Program for implementation of FCFS

```
#include<iostream>
using namespace std;

void findWaitingTime(int processes[], int n, int bt[], int wt[]){
    wt[0] = 0;
    for(int i = 1; i < n; i++){
        wt[i] = bt[i-1] + wt[i-1];
    }
}

void findTurnAroundTime(int processes[], int n, int bt[], int wt[], int tat[]){
    for(int i = 0; i<n; i++){
        tat[i] = bt[i]+wt[i];
    }
}

void findAvgTime(int processes[], int n, int bt[]){
    int wt[n], tat[n], total_wt =0, total_tat = 0;

    findWaitingTime(processes, n, bt, wt);

    findTurnAroundTime(processes, n, bt, wt, tat);

    cout<<"Processes"<<" Burst Time"<<" Waiting Time"<<" Turn around time\n";

    for(int i = 0; i < n; i++){
        total_wt = total_wt + wt[i];
        total_tat = total_tat + tat[i];
        cout<<" "<<i+1<<"\t"<<bt[i]<<"\t "<<wt[i]<<"\t"<<tat[i]<<endl;
    }
    cout<<"average Waiting Time = "<<(float)total_wt/(float)n;
    cout<<"\nAverage Turn Around Time = "<<(float)total_tat/(float)n;

}

int main(){
cout<<"Program by Karan Salunkhe, AIDS – A4, Roll No – 73\n";
int processes[] = { 1,2,3};
int n = sizeof processes / sizeof processes[0];
int burst_time[] = { 10, 5, 8};
findAvgTime(processes, n, burst_time);
```

```
return 0;
}
```

OUTPUT

```
admin1@admin1-M5-7048: ~$ g++ r1.cpp
admin1@admin1-M5-7048: ~$ ./a.out
Processes Burst Time Waiting Time Turn around time
1          10          0          10
2           5          0          15
3           8          0          23
average Waiting Time = 8.33333
Average Turn Around Time =16
admin1@admin1-M5-7048: ~$
```

Experiment No:2

Name:Karan Santosh Salunkhe

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Code:

```
#include<iostream>
using namespace std;

int mat[10][6];

void swap(int* a,int* b)
{
    int temp=*a;
    *a=*b;
    *b=temp;
}
void arrangeArrival(int num,int mat[][6])
{
    for(int i=0;i<num;i++)
    {
        for(int j=0;j<num-i-1;j++)
        {
            if(mat[j][1]>mat[j+1][1])
            {
                for(int k=0;k<5;k++)
                {
                    swap(mat[j][k],mat[j+1][k]);
                }
            }
        }
    }
}
void completionTime(int num,int mat[][6])
{
    int temp,val;
    mat[0][3]=mat[0][1]+mat[0][2];
    mat[0][5]=mat[0][3]-mat[0][1];
    mat[0][4]=mat[0][5]-mat[0][2];
    for(int i=1;i<num;i++)
    {
        temp=mat[i-1][3];
        int low=mat[i][2];
        for(int j=i;j<num;j++)
        {
            if(temp>=mat[j][1]&& low>=mat[j][2])
            {
                low=mat[j][2];
                val=j;
            }
        }
    }
}
```

```

    }
    mat[val][3]=temp+mat[val][2];
    mat[val][5]=mat[val][3]-mat[val][1];
    mat[val][4]=mat[val][5]-mat[val][2];
    for(int k=0;k<6;k++)
    {
        swap(mat[val][k],mat[i][k]);
    }
}
}

int main()
{
    cout<<"program by Karan: roll-no=73 ,batch=A4, branch=AIDS";
    int num,temp;
    cout<<"Enter number of processes:";
    cin>>num;
    cout<<"Enter the processes id..\n";
    for(int i=0;i<num;i++)
    {
        cout<<"process"<<i+1<<"..\n";
        cout<<"Enter process id:";
        cin>>mat[i][0];
        cout<<"Enter arrival time :";
        cin>>mat[i][1];
        cout<<"Enter burst time :";
        cin>>mat[i][2];

    }
    cout << "Before Arrange...\n";
    cout << "Process ID\tArrival Time\tBurst Time\n";
    for (int i = 0; i < num; i++)
    {
        cout << mat[i][0] << "\t\t" << mat[i][1] << "\t\t"
        << mat[i][2] << "\n";

    }

    arrangeArrival(num, mat);
    completionTime(num, mat);
    cout << "Final Result...\n";
    cout << "Process ID\tArrival Time\tBurst Time\tWaiting "

    "Time\tTurnaround Time\n";

    for (int i = 0; i < num; i++) {
        cout << mat[i][0] << "\t\t" << mat[i][1] << "\t\t"
        << mat[i][2] << "\t\t" << mat[i][4] << "\t\t"
        << mat[i][5] << "\n";

    }
}

```

OUTPUT:

```
Terminal
Sep 13 11:18
admin1@admin1-MS-7D48: ~
admin1@admin1-MS-7D48: ~
admin1@admin1-MS-7D48: ~
(base) admin1@admin1-MS-7D48:~$ ./a.out
program by Karan,roll-no=73 ,batch=A4, branch=AIDS..
Enter number of processes:2
Enter the processes id..
process1..
Enter process id:2
Enter arrival time :3
Enter burst time :5
process2..
Enter process id:5
Enter arrival time :6
Enter burst time :7
Before Arrange...
Process ID      Arrival Time      Burst Time
2                3                5
5                6                7
Final Result...
Process ID      Arrival Time      Burst Time      Waiting Time      Turnaround Time
2                3                5                0                5
5                6                7                2                9
(base) admin1@admin1-MS-7D48:~$
```

Experiment No:3

Name:Karan Santosh Salunkhe

Roll no:73

Branch:AIDS

Batch:A4

Code:

```
#include<iostream>
#include<mutex>
using namespace std;
struct semaphore
{
int mutex;
int rcount;
int rwait;
bool wrt;
};
void addReader(struct semaphore *s)
{
if(s->mutex == 0 && s->rcount == 0)
{
cout<<"Sorry, File isopen in Write mode.\nNew Reader added to queue."<<endl;
s->rwait++;
}
else
{
cout<<"Reader Process added."<<endl;
s->rcount++;
s->mutex--;
}
return ;
}

void addWriter(struct semaphore *s)
{
if(s->mutex==1)
{
s->mutex--;
s->wrt=1;
cout<<"\nWriter Process added."<<endl;
}
else if(s->wrt)
cout<<"Sorry, Writer already operational."<<endl;
else
cout<<"Sorry, File open in Read mode."<<endl;
return ;
}

void removeReader(struct semaphore *s)
{
if(s->rcount == 0) cout<<"No readers to remove."<<endl;
else
```

```

{
cout<<"Reader Removed."<<endl;
s->rcount--;
s->mutex++;
}
return ;
}
void removeWriter(struct semaphore *s)
{
if(s->wrt==0) cout<<"No Writer to Remove"<<endl;
else
{
cout<<"Writer Removed"<<endl;
s->mutex++;
s->wrt=0;
if(s->rwait!=0)
{
s->mutex-=s->rwait;
s->rcount=s->rwait;
s->rwait=0;
cout<<"waiting Readers Added:"<<s->rcount<<endl;
}
}
}

int main()
{
struct semaphore S1={1,0,0};
while(1)
{
cout<<"Options"<<endl<<"1. Add Reader."<<endl<<"2. Add Writer."<<endl<<"3. Remove
Reader."<<endl<<"4.Remove Writer."<<endl<<"5. Exit.<<Choice : "<<endl;
int choice;
cin>>choice;
switch(choice)
{
case 1: addReader(&S1); break;
case 2: addWriter(&S1); break;
case 3: removeReader(&S1); break;
case 4: removeWriter(&S1); break;
case 5: cout<<"\n\tGood Bye!";break;
default: cout<<"\nInvalid Entry!";
}
}
return 0;
}

```

OUTPUT:

```
(base) admin1@admin1-MS-7D48:~$ g++ qwe.cpp
(base) admin1@admin1-MS-7D48:~$ ./a.out
Options
1. Add Reader.
2. Add Writer.
3. Remove Reader.
4.Remove Writer.
5. Exit.<<Choice :
1
Reader Process added.
Options
1. Add Reader.
2. Add Writer.
3. Remove Reader.
4.Remove Writer.
5. Exit.<<Choice :
2
Sorry, File open in Read mode.
Options
1. Add Reader.
2. Add Writer.
3. Remove Reader.
4.Remove Writer.
5. Exit.<<Choice :
3
Reader Removed.
Options
1. Add Reader.
2. Add Writer.
3. Remove Reader.
4.Remove Writer.
5. Exit.<<Choice :
2
Writer Process added.
Options
1. Add Reader.
2. Add Writer.
3. Remove Reader.
4.Remove Writer.
5. Exit.<<Choice :
1
Sorry, File isopen in Write mode.
New Reader added to queue.
Options
1. Add Reader.
2. Add Writer.
3. Remove Reader.
4.Remove Writer.
5. Exit.<<Choice :
```