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Week 7 + 9 tasks :

Task 1: First Come First Serve (FCFS):

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

```
int main()
```

```
{
```

```
    int n,bt[20],wt[20],tat[20],avwt=0,avtat=0,i,j;
```

```
    printf("Enter total number of processes(maximum 20):");
```

```
    scanf("%d",&n);
```

```
    printf("\nEnter Process Burst Time\n");
```

```
    for(i=0;i<n;i++)
```

```
    {
```

```
        printf("P[%d]:",i+1);
```

```
        scanf("%d",&bt[i]);
```

```
    }
```

```
    wt[0]=0; //waiting time for first process is 0
```

```
    //calculating waiting time
```

```
    for(i=1;i<n;i++)
```

```
    {
```

```
        wt[i]=0;
```

```
        for(j=0;j<i;j++)
```

```
            wt[i]+=bt[j];
```

```

}

printf("\nProcess\t\tBurst Time\tWaiting Time\tTurnaround Time");

//calculating turnaround time
for(i=0;i<n;i++)
{
    tat[i]=bt[i]+wt[i];
    avwt+=wt[i];
    avtat+=tat[i];
    printf("\nP[%d]\t\t%d\t\t%d\t\t%d",i+1,bt[i],wt[i],tat[i]);
}

avwt/=i;
avtat/=i;
printf("\n\nAverage Waiting Time:%d",avwt);
printf("\n\nAverage Turnaround Time:%d\n",avtat);

return 0;
}

```

Output:

```

saqib@saqib-VirtualBox:~/Week 7 and 8 tasks$ ./a1
Enter total number of processes(maximum 20):3

Enter Process Burst Time
P[1]:4
P[2]:1
P[3]:7

Process          Burst Time      Waiting Time     Turnaround Time
P[1]              4                0                4
P[2]              1                4                5
P[3]              7                5               12

Average Waiting Time:3
Average Turnaround Time:7

```

Task 2: Priority Scheduling Algorithm:

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

```
int main()
```

```
{
```

```
    int bt[20],p[20],wt[20],tat[20],pr[20],i,j,n,total=0,pos,temp,avg_wt,avg_tat;
```

```
    printf("Enter Total Number of Process:");
```

```
    scanf("%d",&n);
```

```
    printf("\nEnter Burst Time and Priority\n");
```

```
    for(i=0;i<n;i++)
```

```
    {
```

```
        printf("\nP[%d]\n",i+1);
```

```
        printf("Burst Time:");
```

```
        scanf("%d",&bt[i]);
```

```
        printf("Priority:");
```

```
        scanf("%d",&pr[i]);
```

```
        p[i]=i+1;        //contains process number
```

```
    }
```

```
    //sorting burst time, priority and process number in ascending order using selection sort
```

```
    for(i=0;i<n;i++)
```

```
    {
```

```
        pos=i;
```

```
        for(j=i+1;j<n;j++)
```

```
        {
```

```
            if(pr[j]<pr[pos])
```

```
                pos=j;
```

```
        }
```

```

temp=pr[i];
pr[i]=pr[pos];
pr[pos]=temp;

temp=bt[i];
bt[i]=bt[pos];
bt[pos]=temp;

temp=p[i];
p[i]=p[pos];
p[pos]=temp;
}

wt[0]=0; //waiting time for first process is zero

//calculate waiting time
for(i=1;i<n;i++)
{
    wt[i]=0;
    for(j=0;j<i;j++)
        wt[i]+=bt[j];

    total+=wt[i];
}

avg_wt=total/n;    //average waiting time
total=0;

```

```

printf("\nProcess\t Burst Time \tWaiting Time\tTurnaround Time");

for(i=0;i<n;i++)
{
    tat[i]=bt[i]+wt[i]; //calculate turnaround time
    total+=tat[i];

    printf("\nP[%d]\t\t %d\t\t %d\t\t\t%d",p[i],bt[i],wt[i],tat[i]);
}

avg_tat=total/n; //average turnaround time
printf("\n\nAverage Waiting Time=%d",avg_wt);
printf("\n\nAverage Turnaround Time=%d\n",avg_tat);

return 0;
}

```

Output:

```

saqib@saqib-VirtualBox:~/Week 7 and 8 tasks$ ./2
Enter Total Number of Process:4

Enter Burst Time and Priority

P[1]
Burst Time:3
Priority:2

P[2]
Burst Time:7
Priority:4

P[3]
Burst Time:6
Priority:1

P[4]
Burst Time:2
Priority:6

Process      Burst Time      Waiting Time      Turnaround Time
P[3]          6                0                 6
P[1]          3                6                 9
P[2]          7                9                16
P[4]          2                16                18

Average Waiting Time=7
Average Turnaround Time=12

```

Task 3: Shortest Job First:

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

```
void main()
```

```
{
```

```
    int bt[20],p[20],wt[20],tat[20],i,j,n,total=0,pos,temp;
```

```
    float avg_wt,avg_tat;
```

```
    printf("Enter number of process:");
```

```
    scanf("%d",&n);
```

```
    printf("\nEnter Burst Time:\n");
```

```
    for(i=0;i<n;i++)
```

```
    {
```

```
        printf("p%d:",i+1);
```

```
        scanf("%d",&bt[i]);
```

```
        p[i]=i+1;        //contains process number
```

```
    }
```

```
    //sorting burst time in ascending order using selection sort
```

```
    for(i=0;i<n;i++)
```

```
    {
```

```
        pos=i;
```

```
        for(j=i+1;j<n;j++)
```

```
        {
```

```
            if(bt[j]<bt[pos])
```

```
                pos=j;
```

```
        }
```

```

temp=bt[i];
bt[i]=bt[pos];
bt[pos]=temp;

temp=p[i];
p[i]=p[pos];
p[pos]=temp;
}

wt[0]=0;    //waiting time for first process will be zero

//calculate waiting time
for(i=1;i<n;i++)
{
    wt[i]=0;
    for(j=0;j<i;j++)
        wt[i]+=bt[j];

    total+=wt[i];
}

avg_wt=(float)total/n;    //average waiting time
total=0;

printf("\nProcess\t Burst Time \tWaiting Time\tTurnaround Time");
for(i=0;i<n;i++)
{
    tat[i]=bt[i]+wt[i];    //calculate turnaround time

```

```

        total+=tat[i];

        printf("\np%d\t\t %d\t\t %d\t\t %d",p[i],bt[i],wt[i],tat[i]);
    }

    avg_tat=(float)total/n;    //average turnaround time
    printf("\n\nAverage Waiting Time=%f",avg_wt);
    printf("\n\nAverage Turnaround Time=%f\n",avg_tat);
}

```

Output :

```

saqib@saqib-VirtualBox:~/Week 7 and 8 tasks$ ./3
Enter number of process:3

Enter Burst Time:
p1:4
p2:1
p3:6

Process      Burst Time      Waiting Time      Turnaround Time
p2            1                0                 1
p1            4                1                 5
p3            6                5                11

Average Waiting Time=2.000000
Average Turnaround Time=5.666667

```

Task 4: Round Robin:

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

```
int main()
```

```
{
```

```
    int count,j,n,time,remain,flag=0,time_quantum;
```

```
    int wait_time=0,turnaround_time=0,at[10],bt[10],rt[10];
```

```
    printf("Enter Total Process:\t ");
```

```
    scanf("%d",&n);
```



```

remain=n;
for(count=0;count<n;count++)
{
    printf("Enter Arrival Time and Burst Time for Process Process Number %d
: ",count+1);

    scanf("%d",&at[count]);
    scanf("%d",&bt[count]);
    rt[count]=bt[count];
}
printf("Enter Time Quantum:\t");
scanf("%d",&time_quantum);
printf("\n\nProcess\t| Turnaround Time | Waiting Time\n\n");
for(time=0,count=0;remain!=0;)
{
    if(rt[count]<=time_quantum && rt[count]>0)
    {
        time+=rt[count];
        rt[count]=0;
        flag=1;
    }
    else if(rt[count]>0)
    {
        rt[count]-=time_quantum;
        time+=time_quantum;
    }
    if(rt[count]==0 && flag==1)
    {
        remain--;
    }
}

```

```

    printf("P[%d]\t|\t%d\t|\t%d\n",count+1,time-at[count],time-at[count]-
bt[count]);

    wait_time+=time-at[count]-bt[count];

    turnaround_time+=time-at[count];

    flag=0;
}
if(count==n-1)
    count=0;
else if(at[count+1]<=time)
    count++;
else
    count=0;
}

printf("\nAverage Waiting Time= %f\n",wait_time*1.0/n);
printf("Avg Turnaround Time = %f",turnaround_time*1.0/n);

return 0;
}

```

Output:

```

Enter Total Process:      3
Enter Arrival Time and Burst Time for Process Process Number 1 :3
4
Enter Arrival Time and Burst Time for Process Process Number 2 :1
5
Enter Arrival Time and Burst Time for Process Process Number 3 :2
6
Enter Time Quantum:      2

Process |Turnaround Time|Waiting Time
P[1]    |      5      |      1
P[2]    |     12      |      7
P[3]    |     13      |      7

Average Waiting Time= 5.000000
Avg Turnaround Time = 10.000000saqib@saqib-VirtualBox:~/Week 7 and 8 tasks$

```