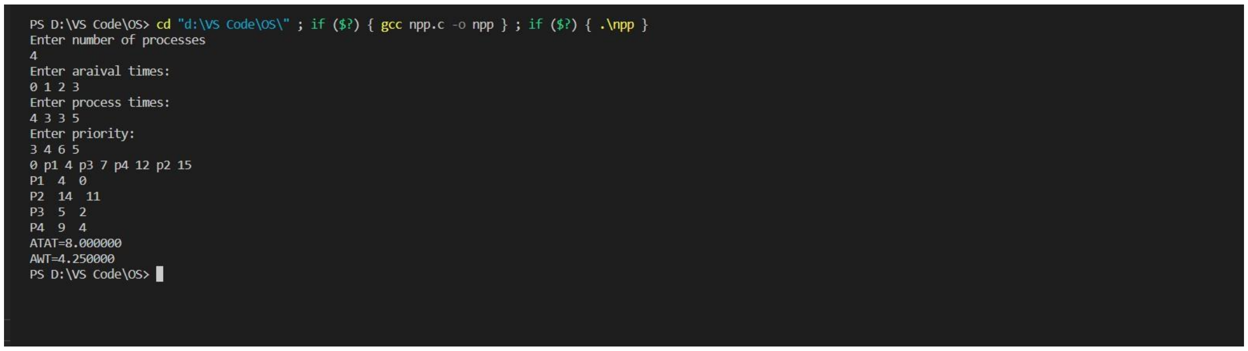
2. Write a C program to simulate the following CPU scheduling
   algorithm to find turnaround time and waiting time.
   Priority (pre-emptive & Non-pre-emptive)
   Round Robin (Experiment with different quantum sizes for RR
   algorithm)

Code:

```
#include<stdio.h>

int at[10],t,pt[10],tat[10],wt[10],n,time=0,i,ready[10],pry[10],op=0, maxpr,x,p[10];
float atat=0,awt=0;

void main()
{
    printf("Enter number of processes \n");
    scanf("%d",&n);

    printf("Enter araival times: \n");
    for(i=0;i<n;i++)
    scanf("%d",&at[i]);

    printf("Enter process times: \n");
    for(i=0;i<n;i++)
    scanf("%d",&pt[i]);

    printf("Enter priority: \n");
    for(i=0;i<n;i++)
    scanf("%d",&pry[i]);

    for(i=0;i<n;i++)
    ready[i]=0;

    for(i=0;i<n;i++)
    p[i]=pt[i];

    for(i=0;i<n;i++)
    time+=pt[i];
    t=n;
    while(t--)
    {
        for(i=0;i<n;i++)
        if(op>=at[i])
        ready[i]=1;
    for(i=0;i<n;i++)
    if(pt[i]==0)
    pry[i]=0;


    //finding index of max priority
    maxpr=pry[0];
    for(i=0;i<n;i++)
    if(ready[i]==1)
    if(pry[i]>maxpr)
    maxpr=pry[i];

    for(i=0;i<n;i++)
    if(maxpr==pry[i])
    x=i;

    //printing chart
    printf("%d p%d ",op,(x+1));


    op=op+pt[x];
    tat[x]=op;
    ready[x]=0;
    pry[x]=0;
}
printf("%d",op);

//finding avgtat and avg wt
for(i=0;i<n;i++)
{
    tat[i]=tat[i]-at[i];
}

for(i=0;i<n;i++)
{
    atat+=tat[i];
    wt[i]=tat[i]-pt[i];
}
for(i=0;i<n;i++)
awt+=wt[i];

awt=awt/n;
atat=atat/n;
```

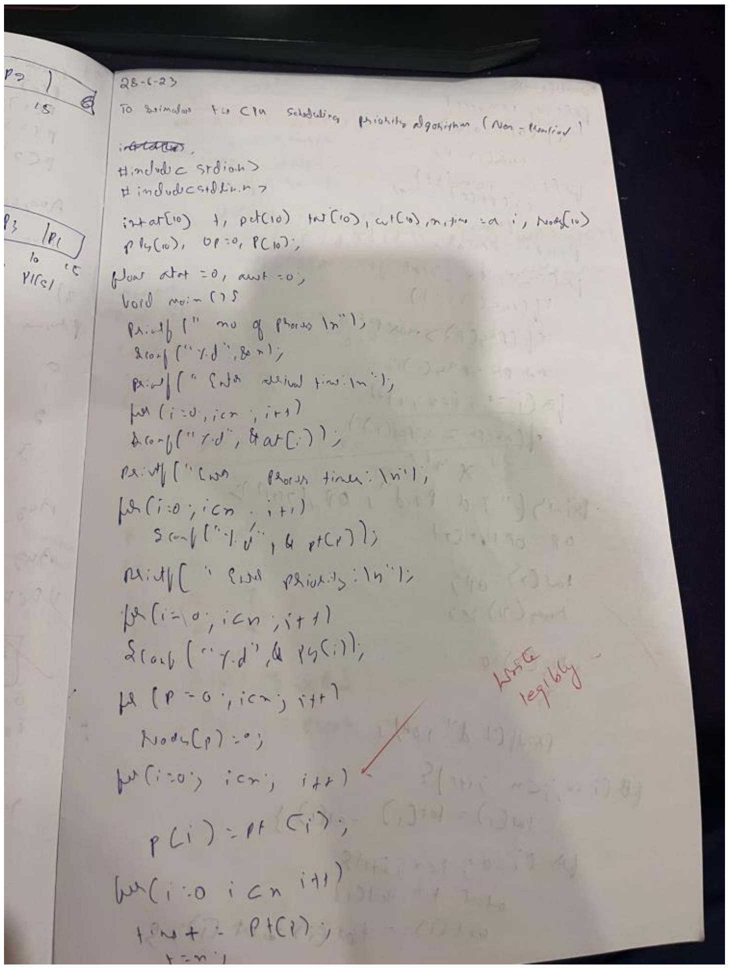
```
    //printing final values
    printf("\n");
    for(i=0;i<n;i++)
    printf("P%d  %d  %d \n",(i+1),tat[i],wt[i]);
    printf("ATAT=%f  \nAWT=%f ",atat,awt);
}
```

Output:

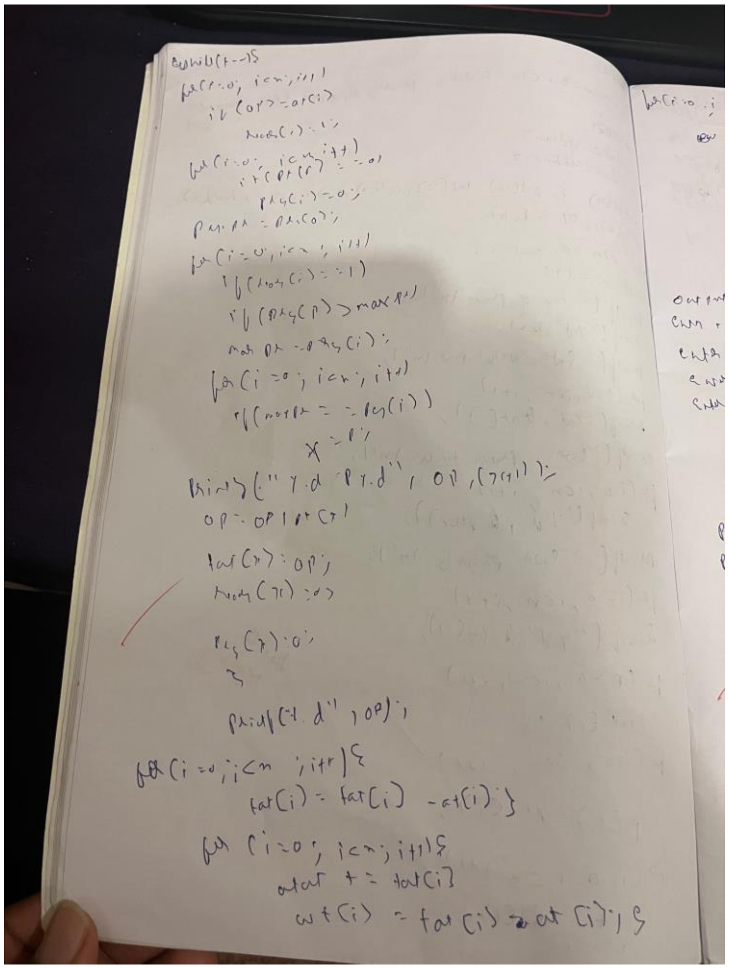


```
PS D:\VS Code\OS> cd "d:\VS Code\OS\" ; if ($?) { gcc npp.c -o npp } ; if ($?) { .\npp }
Enter number of processes
4
Enter araival times:
0 1 2 3
Enter process times:
4 3 3 5
Enter priority:
3 4 6 5
0 p1 4 p3 7 p4 12 p2 15
P1  4  0
P2  14  11
P3  5  2
P4  9  4
ATAT=8.000000
AWT=4.250000
PS D:\VS Code\OS> 
```

Observation :



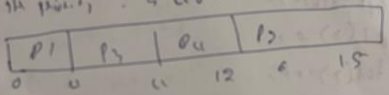
```
28-6-23
To simulate the CPU Scheduling priority algorithm (Non-Preemtive)

~~[illegible]~~,
#include<stdio.h>
#include<stdlib.h>

int at[10] t, pt[10] tat[10], wt[10], n, time =0 i, Node[10]
p ly[10], op=0, P[10];
float atat =0, awt =0;
void main () {
 Printf (" no of Process \n");
 scanf ("%d", &n);
 Printf (" Enter arrival time:\n");
 for (i=0; i<n ; i++)
 scanf("%d", &at[i]);
Printf ("Enter Process time: \n");
for (i=0 ; i<n ; i++)
    scanf ("%d", & pt[i]);
Printf (" Enter Priority : \n");
for (i=0 ; i<n ; i++)
scanf ("%d", & py[i]);
for (P=0 ; i<n; i++)
  Node[p]=0;
for (i=0; i<n; i++)
   p[i] = pt [i];
for(i=0 i<n i++)
 time + = Pt[i];
 t=n;
```
Write legibly



```
while(t--){
for(i=0; i<n; i++)
   if (op>=ar(i)
      node(i)=1;
 for(i=0; i<n; i++)
      if(pr(i)==0)
         pry(i)=0;
 max pr = pr(0);
 for(i=0; i<n; i++)
    if(node(i)==1)
    if(pry(p)>max pr)
    max pr = pry(i);
   for(i=0; i<n; i++)
     if(maxpr == pry(i))
          x = i;
 printf("%d P%d", op, (x+1));
  op = op + bt(x)

  tat(x) = op;
  node(x) = 0;

  pry(x) = 0;
  }
    printf("%d", op);
for(i=0; i<n ; i++){
        tat(i) = tat[i] - at(i); }
   for (i=0; i<n; i++){
       atat += tat[i]
         wt(i) = tat(i) - at [i]; }
```

```
for(i=0;i<n;i++)
   awt += wt(i);
     atat = awt/n;
   atat = atat/n;
   printf("\n");
   for(i=0; i<n ;i++)
    printf("P %d %d %d \n", (i+1), tat(i), wt(i));
    printf("ATAT = %f in awt = %f", atat, awt);
```

output
Enter the no of process: 4
Enter the arrival time: 0 1 0 3
Enter the burst time: 4 2 3 5
Enter the priority: 3 4 6 5



P1	4	0
P2	14	11
P3	5	2
P4	d	4

ATAT = 8.0000

AWT = 4.5000

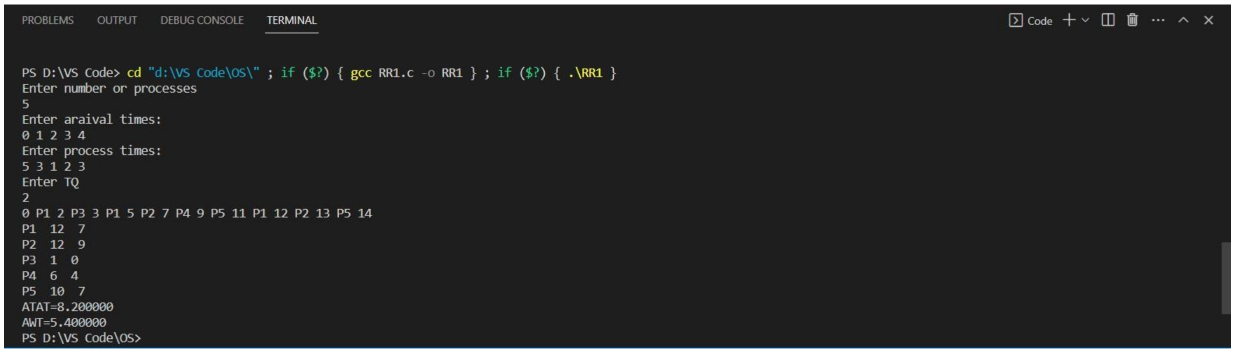
Code:

```
#include<stdio.h>

    int tq, at[10], pt[10], p[10], time=0, op=0, i,j ,n, ready[10],q[100];
    int r=-1,f=0,tat[10],wt[10],z,fg,y=9999,ch;
    float atat,awt;

int rr(int x)
{
    if(pt[x]>tq)
    {
        pt[x]-=tq;
        op+=tq;
    }
    else
    {
        op+=pt[x];
        pt[x]=0;
        tat[x]=op;
        ready[x]=0;
    }
    return x;
}

void main()
{
    printf("Enter number or processes \n");
    scanf("%d",&n);

    printf("Enter araival times: \n");
    for(i=0;i<n;i++)
    scanf("%d",&at[i]);

    printf("Enter process times: \n");
    for(i=0;i<n;i++)
    scanf("%d",&pt[i]);

    printf("Enter TQ \n");
    scanf("%d",&tq);

    for(i=0;i<n;i++)
    ready[i]=0;
```

```
for(i=0;i<n;i++)
q[i]=9999;

for(i=0;i<n;i++)
p[i]=pt[i];

for(i=0;i<n;i++)
time+=pt[i];


for(i=0;i<n;i++)
    if(op>=at[i])
    ready[i]=1;

for(i=0;i<n;i++)
    if(ready[i]==1)
    {
        q[++r]=i;
    }

while(op!=time)
{
    printf("%d ",op);
    if(z==y)
    q[++f];
    y=z;

    ch=q[f];
    if(pt[ch]!=0)
    {
    z=rr(q[f]);

    printf("P%d ",(z+1));

    for(i=0;i<n;i++)
    {
       if(op>=at[i] && pt[i]!=0)
       {
        fg=0;
        j=f;
        while(j<=r)
        {
            if(i==q[j])
            fg=1;
```

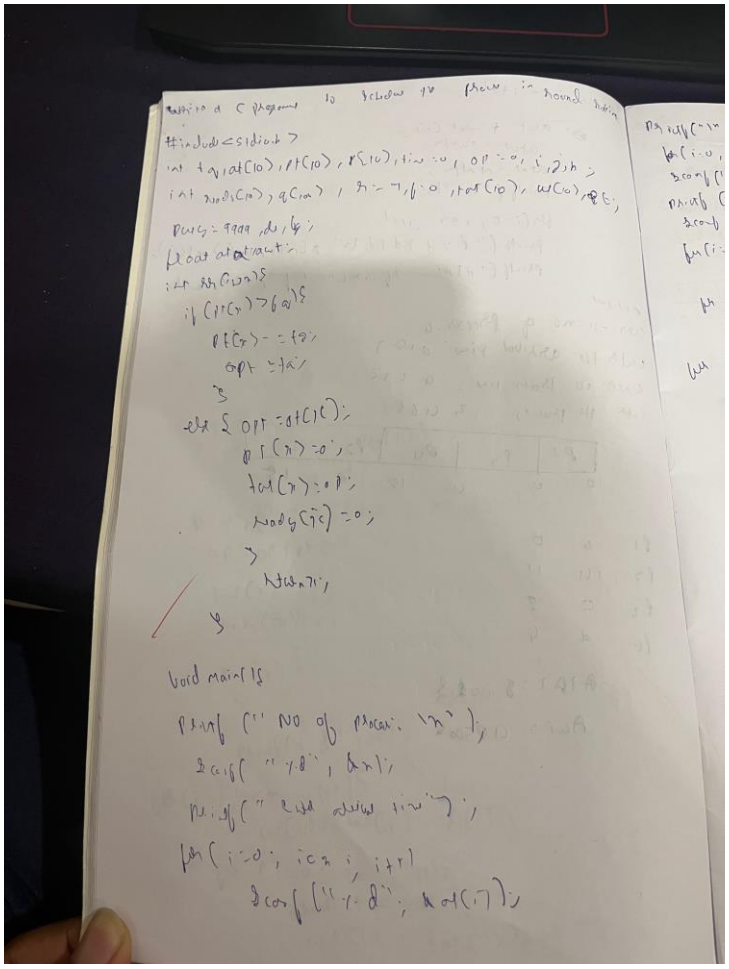
```
                j++;
            }
            if(fg==0)
            {
                q[++r]=i;
            }
           }
        }
        if(pt[z]!=0)
        q[++r]=z;
        }
        f++;
    }

    printf("%d ",op);

    for(i=0;i<n;i++)
    {
        tat[i]=tat[i]-at[i];
        wt[i]=tat[i]-p[i];
        atat+=tat[i];
        awt+=wt[i];
    }
    atat=atat/n;
    awt=awt/n;

    printf("\n");
    for(i=0;i<n;i++)
    printf("P%d %d %d \n",(i+1),tat[i],wt[i]);
    printf("ATAT=%f \nAWT=%f ",atat,awt);
}
```

Output:



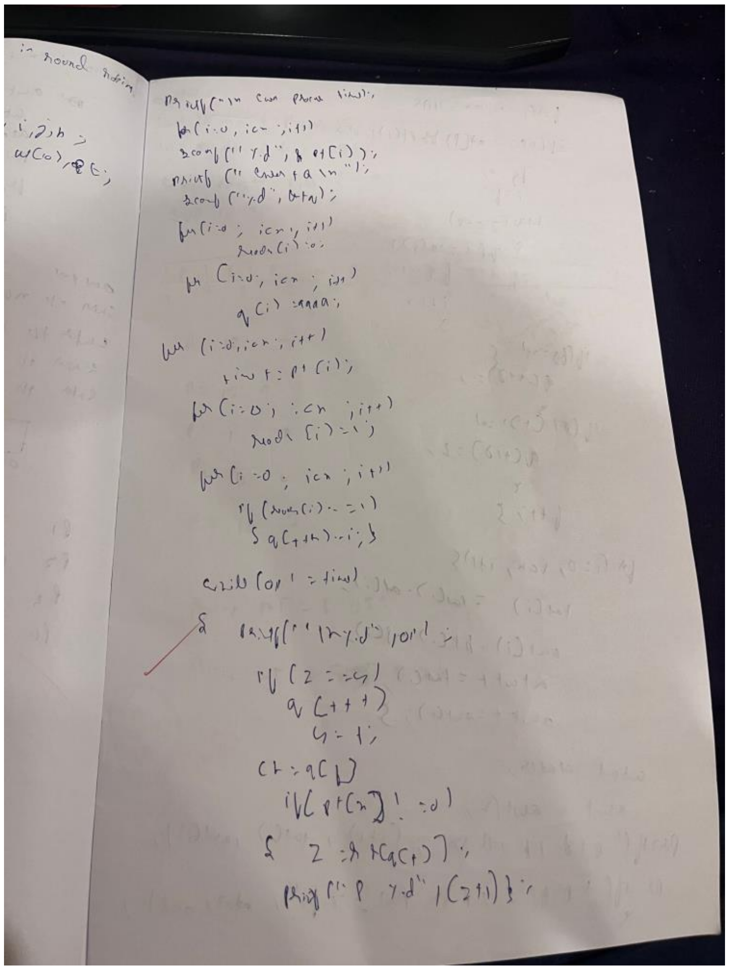
```
PS D:\VS Code> cd "d:\VS Code\OS\" ; if ($?) { gcc RR1.c -o RR1 } ; if ($?) { .\RR1 }
Enter number or processes
5
Enter araival times:
0 1 2 3 4
Enter process times:
5 3 1 2 3
Enter TQ
2
0 P1 2 P3 3 P1 5 P2 7 P4 9 P5 11 P1 12 P2 13 P5 14
P1  12  7
P2  12  9
P3  1  0
P4  6  4
P5  10  7
ATAT=8.200000
AWT=5.400000
PS D:\VS Code\OS>
```

Observation:

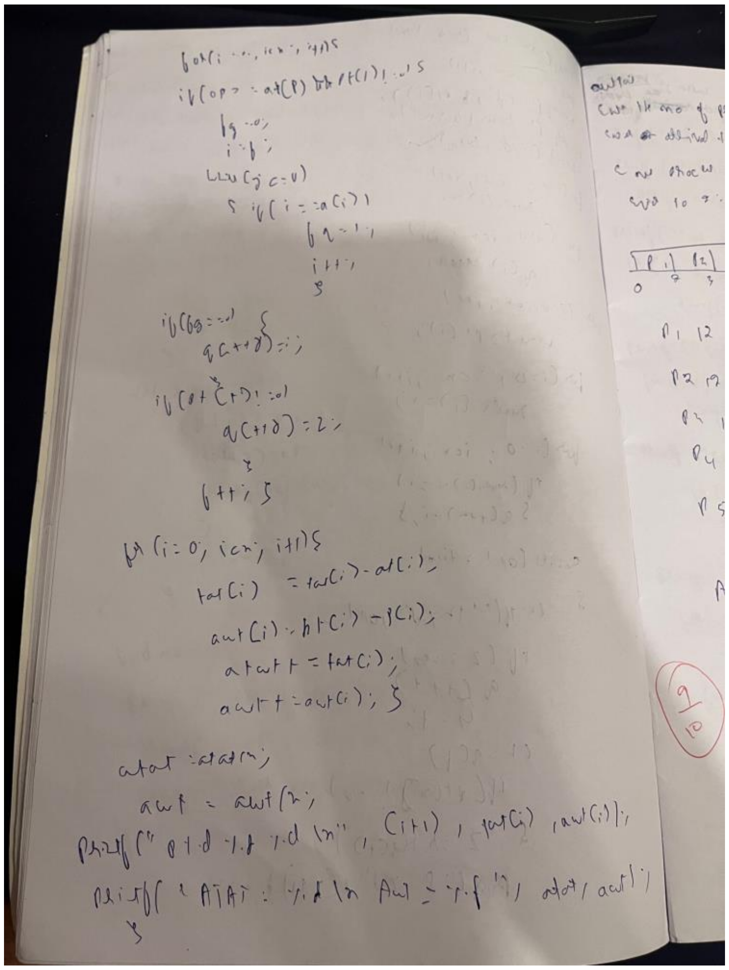


write a C program to schedule the process in round robin

```
#include<stdio.h>
int tq,at(10),pt(10),r(10),time=0, op=0, i,j,n;
int nodi(10),q(10) , r=-1,f=0 ,tat(10), w(10),[illegible];
pury=9999 ,d,tq;
float atat,awt;
int rr(int x){
  if (pt(x)>tq){
    pt(x)-=tq;
     opt +=tq;
   }
  else { opt =at(x);
        pt(x)=0;
        tat(x)=op;
        nody(x)=0;
        }
         return x;
   }

void main(){
 printf("No of process: \n");
  scanf( "%d", &n);
  printf(" enter arrival time");
 for( i=0; i<n ; i++)
       scanf("%d", &at(i));
```



```
in round robin
i,j,n;
w(10),&(;

printf("\n enter process time");
for(i=0, i<n;i++)
 scanf("%d", & pt[i]);
printf(" enter t a \n");
 scanf("%d", &tn);
for(i=0; i<n; i++)
     rem(i)=0;
 for (i=0; i<n; i++)
     q(i) =aaaa;
for (i=0;i<n; i++)
     tim t= pt (i);
 for(i=0; i<n ;i++)
      rem [i]=1;
 for(i=0; i<n ;i++)
     if (rem(i)==1)
     { q(t+h)=i; }
 while (op != tim)
 {  printf("\n%d", op);
     if (z ==y)
       q (t+t)
        y= 1;
     ct =q[t]
      if( pt[x] != 0)
     {  z =pt[q(t)];
      printf(" p %d", (z+1) };
```



```
for(i=0; i<n; i++){
if(op>=at(P) && rt(i)!=0){
    fg=0;
    i=f;
   while(j<=v)
    { if(i==a(i))
            fg=1;
            i++;
            }
  if(fg==0)
     q(++r)=i;
  }
 if(rt(r)!=0)
     q(++r)=2;
     }
   f++; }

for(i=0; i<n; i++){
   tat(i)  =tat(i)-at(i);
   awt(i)=bt(i)-p(i);
   atat+=tat(i);
   awt+=awt(i); }

atat=atat/n;
  awt = awt/n;
printf("P%d %f %d\n", (i+1), tat(i), awt(i));
printf("ATAT: %d\n Awt = %f", atat, awt);
}
```

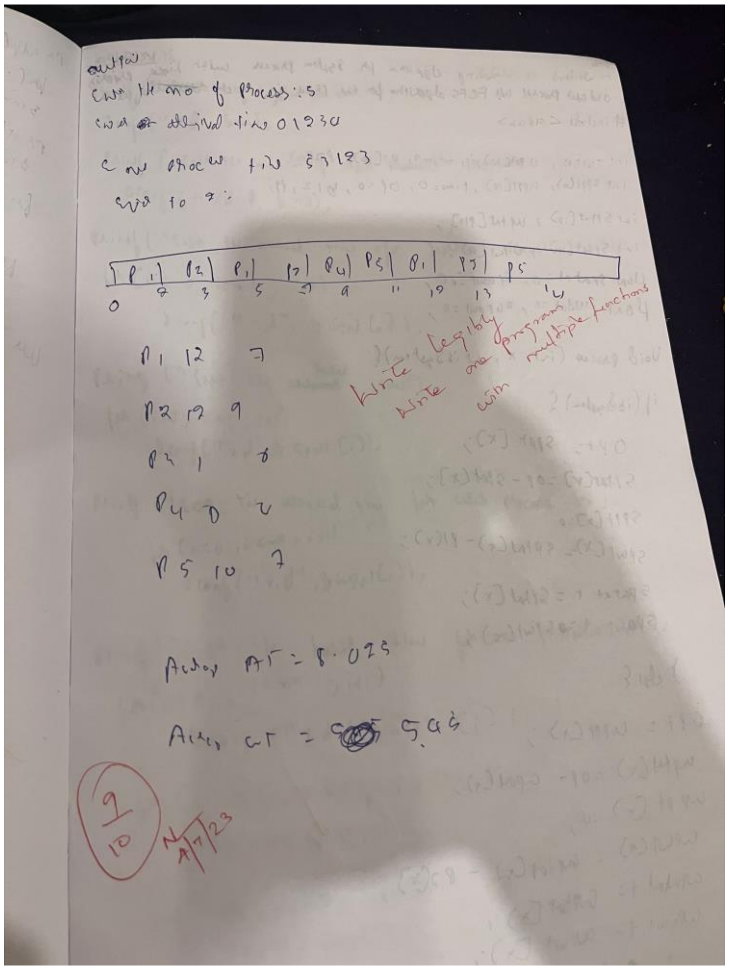
output
Enter the no of p
Enter arrival
Enter process
Enter 10 ..

| P1 | P2 |
0 2 3

P1 12
P2 12
P3
P4
P5

A

9/10



output
Enter the no of Process: 5
Enter arrival time 0 1 2 3 4

Enter process time 5 3 1 2 3
[illegible] to 2 :

```
| P1 | P2 | P1 | P3 | P4 | P5 | P1 | P5 | P5
0    2    3    5    7    9    11   12   13   14
```

P1	12	7
P2	12	9
P3	1	0
P4	0	2
P5	10	7

Write legibly
Write one program with multiple functions

Avrg AT = 8.025

Avrg WT = [illegible] 5.45

$\frac{9}{10}$

N 4/7/23