WEEK 2

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

CODE:
Priority (pre-emptive or Non-pre-emptive)

```
#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);
}
```

Round Robin

```
#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));
```

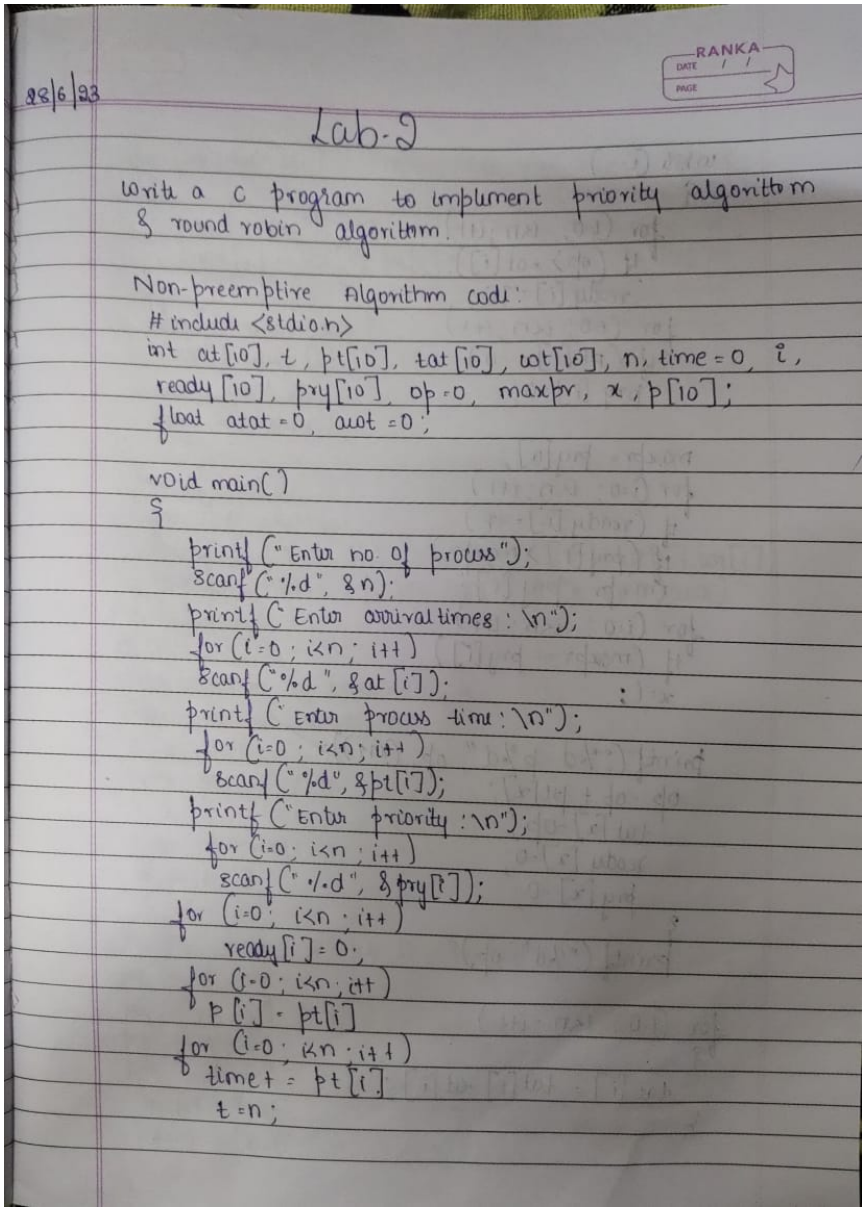
```
        for(i=0;i<n;i++)
        {
          if(op>=at[i] && pt[i]!=0)
          {
           fg=0;
           j=f;
           while(j<=r)
           {
               if(i==q[j])
               fg=1;
               j++;
           }
           if(fg==0)
           {
               q[++r]=i;
    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

OBSERVATION:



28/6/23

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DATE / /
PAGE

Lab-2

Write a c program to implement priority algorithm & round robin algorithm.

Non-preemptive 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 no of process");
  scanf("%d", &n);
  printf("Enter arrival times : \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", &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;

  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;

  printf ("%d p%d", op, (x+1));
  op = op + pt[x];
  tat[x] = op;
  ready[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] - pt[i];
}
for (i=0; i<n; i++)
  awt = awt + wt[i];
awt = 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 \n AWT = %f ", atat, awt);
}
```

OUTPUT:

Enter number of processes : 4
Enter arrival time
0 2 3 4
Enter process time
5 4 2 4
Enter priority
4 2 6 3

0 p1 5 p3 7 p4 11 p2 15

p1	5	0
p2	13	9
p3	4	2
p4	7	3

ATAT = 7.25
AWT = 3.5

Round-Robin Algorithm 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, fq, y, 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 no. of processes \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 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)
        {
            q[r] = i;
            r = r+1;
            while (j <= r)
            {
                if (i == q[j])
                    q = 1;
                j++;
            }
            if (q == 0)
            {
                q[++r] = i;
            }
        }
    }
    if (pt[z] != 0)
        q[++r] = z;
    }
    ++t;
}
printf("%d", op);
for (i=0; i<n; i++)
{
    tat[i] = tat[i] - at[i];
    wt[i] = tat[i] - b[i];
    atat += tat[i];
    awt += wt[i];
}
atat = atat/n;
awt = awt/n;
printf("\n");
for (i=0; i<n; i++)
printf("\n P%d %d %d \n", (i+1), tat[i], wt[i]);
printf("ATAT = %f \n AWT = %f", atat, awt);
}
```

OUTPUT:

Enter no. of processes : 5

Enter arrival time

0 1 2 3 4

Enter process time

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 = 8.2

AWT = 5.4

22/10/23

OUTPUT:

PRIORITY OUTPUT:

ROUND ROBIN OUTPUT: