Experiment No. - 03

Experiment No. 3(a)

Objective:

Calculate avgWT and avgTAT using Priority Scheduling (Preemptive).

Program:

```
#include<stdio.h>
void swap(int *a, int *b)
{
   int temp;
   temp = *a;
   *a = *b;
   *b = temp;
}
void main()
{
   int n;
   float avgWT = 0.0;
   float avgTAT = 0.0;
   printf("No of Process  :  ");
   scanf("%d",&n);
   int AT[n],BT[n],PR[n],CT[n],WT[n],TAT[n],RBT[n];
   printf("Enter the AT,BT and Priority of Process\n");
   for(int i=0;i<n;i++)
   {
      printf("P[%d]\t",i);
      scanf("%d%d %d ",&AT[i],&BT[i],&PR[i]);
   }
   // Sort the Input
   for(int i=0;i<n;i++)
   {
      for(int j=0;j<n-1-i;j++)
      {
         if(*(AT+j)>*(AT+j+1))
         {
            swap((AT+j),(AT+j+1));
            swap((BT+j),(BT+j+1));
            swap((PR+j),(PR+j+1));
         }
      }
   }
   int sum=0;
   for(int i=0;i<n;i++)
   {
      RBT[i]=BT[i];
      sum+=BT[i];
   }
   int time=AT[0],min,k;
   for(int i=0;i<sum;i++)
   {
      min=100;
      k=0;
      for(int j=0;j<n;j++)
      {
```

```
        if(RBT[j]!=0)
        {
           if(AT[j]<=time)
           {
              if(PR[j]<min)
              {
                 min=PR[j];
                 k=j;
              }
           }
        }
     }
     RBT[k]=RBT[k]-1;
     time=time+1;
     CT[k]=time;
  }
  for(int i=0;i<n;i++)
  {
     WT[i]=CT[i]-AT[i]-BT[i];
     TAT[i]=CT[i]-AT[i];
     avgTAT += TAT[i];
     avgWT += WT[i];
  }
  avgWT = avgWT/n;
  avgTAT = avgTAT/n;
  printf("\n   \tAT\tBT\tPR\tWT\tTAT\n");
  for(int i=0;i<n;i++)
     printf("P[%d]\t%d\t%d\t%d\t%d\t%d\n",i,AT[i],BT[i],PR[i],WT[i],TAT[i]);
  printf("\nAverage Waiting Time is %f Units\n",avgWT);
  printf("Average Turn Around Time is %f Units",avgTAT);
}
```

Input/Output:

```
No of Process  :  4
Enter the AT,BT and Priority of Process
P[0]    0       5       1
P[1]    3       5       1
P[2]    4       5       3
P[3]    5       6       2

        AT      BT      PR      WT      TAT
P[0]    0       5       1       0       5
P[1]    3       5       1       2       7
P[2]    4       5       3       12      17
P[3]    5       6       2       5       11

Average Waiting Time is 4.750000 Units
Average Turn Around Time is 10.000000 Units
```

Result:

We have verified **Priority Scheduling (Preemptive)** Successfully.

Experiment No. 3(b)

Objective:

Calculate avgWT and avgTAT using Priority Scheduling (Non - Preemptive).

Program:

```
#include<stdio.h>
void swap(int *a, int *b)
{
   int temp;
   temp = *a;
   *a = *b;
   *b = temp;
}
void main()
{
   int n;
   printf("No of Process  :  ");
   scanf("%d",&n);
   int AT[n],BT[n],PR[n],CT[n],WT[n],TAT[n],RBT[n];
   printf("Enter the AT,BT and Priority of Process\n");
   for(int i=0;i<n;i++)
   {
      printf("P[%d]\t",i);
      scanf("%d%d%d",&AT[i],&BT[i],&PR[i]);
   }
   float avgWT = 0.0;
   float avgTAT = 0.0;
   for(int i=0;i<n;i++)
   {
      for(int j=0;j<n-1-i;j++)
      {
         if(*(AT+j)>*(AT+j+1))
         {
            swap((AT+j),(AT+j+1));
            swap((BT+j),(BT+j+1));
            swap((PR+j),(PR+j+1));
         }
      }
   }
   int flag[n];
   for(int i=0;i<n;i++)
   {
      flag[i]=0;
   }
   int time=AT[0],min,k;
   for(int j=0;j<n;j++)
   {
      min=100;
      k=0;
      for(int i=0;i<n;i++)
      {
         if(flag[i]==0)
```

```
        {
          if(AT[i]<=time)
          {
            if(PR[i]<min)
            {
              min=PR[i];
              k=i;
            }
          }
        }
      }
      CT[k]=BT[k]+time;
      time=time+BT[k];
      flag[k]=1;
      WT[k]=CT[k]-(BT[k]+AT[k]);
      TAT[k]=CT[k]-AT[k];
      avgTAT += TAT[k];
      avgWT += WT[k];
    }

    avgWT = avgWT/n;
    avgTAT = avgTAT/n;

    printf("\n  \tAT\tBT\tPR\tWT\tTAT\n");
    for(int i=0;i<n;i++)
      printf("P[%d]\t%d\t%d\t%d\t%d\t%d\n",I,AT[i],BT[i],PR[i],WT[i],TAT[i]);
    printf("\nAverage Waiting Time is %f Units\n",avgWT);
    printf("Average Turn Around Time is %f Units",avgTAT);
}
```

Input/Output:

```
No of Process  :  4
Enter the AT,BT and Priority of Process
P[0]    0       4       1
P[1]    2       5       1
P[2]    3       4       2
P[3]    3       4       1

        AT      BT      PR      WT      TAT
P[0]    0       4       1       0       4
P[1]    2       5       1       2       7
P[2]    3       4       2       10      14
P[3]    3       4       1       6       10

Average Waiting Time is 4.500000 Units
Average Turn Around Time is 8.750000 Units
```

Result:

We have verified **Priority Scheduling (Non - Preemptive)** Successfully.