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Lab 9

CPU Scheduling Algorithms

1. First Come First Served (FCFS)

Code:

```
#include<bits/stdc++.h>
usingnamespacestd;

classProcess
{
private:
   int at;
   intbt;
   intct;
   int tat;
   intwt;
   intPid;

public:
   int&operator[](stringvar)
   {
      if(var=="at")
         return at;
      if(var=="bt")
         returnbt;
      if(var=="ct")
         returnct;
      if(var=="tat")
         return tat;
      if(var=="wt")
         returnwt;
      returnPid;
   }

   voidupdate_after_ct()
   {
      tat =ct- at;
      wt= tat -bt;
   }

   voiddisplay()
```

```
    {
        printf("%d\t%d\t%d\t%d\t%d\t%d\n",Pid, at,bt,ct, tat,wt);
    }
};

floataverage(vector<Process>P,stringvar)
{
    inttotal=0;
    for(autotemp:P)
    {
        total+=temp[var];
    }
    return(float)total/P.size();
}

intmain()
{
    intn;
    cout<<"Enter the number of processes: ";
    cin>>n;
    cout<<"Enter the arrival time and burst time for each process\n";
    intcounter=0;
    vector<Process>P(n);
    for(Process&temp:P)
    {
        temp["id"]=counter++;
        cin>>temp["at"]>>temp["bt"];
    }
    sort(P.begin(),P.end(),
         [](Processfirst,Processsecond)
         {
             returnfirst["at"]<second["at"];
         });
    printf("Pid\tat\tbt\tct\ttat\twt\n");
    P[0]["ct"]=P[0]["at"]+P[0]["bt"];
    P[0].update_after_ct();
    P[0].display();
    for(inti=1;i<P.size();i++)
    {
        if(P[i]["at"]<P[i-1]["ct"])
        {
            P[i]["ct"]=P[i-1]["ct"]+P[i]["bt"];
        }
        else
        {
            printf("curr['at'] :%d, prev['ct'] : %d\n",
                   P[i]["at"],P[i-1]["ct"]);
            P[i]["ct"]=P[i]["at"]+P[i]["bt"];
```

```
    }
    P[i].update_after_ct();
    P[i].display();
  }

  printf("Average waiting time : %f\n",average(P,"wt"));
  return0;
}
```

Output:

```
Enter the number of processes: 4
Enter the arrival time and burst time for each process
0 3
1 4
1 3
0 5
Pid     at      bt      ct      tat     wt
0       0       3       3       3       0
3       0       5       8       8       3
1       1       4       12      11      7
2       1       3       15      14      11
Average waiting time : 5.250000
```