UIT2512---Operating Systems Practices Lab

Implementation of FCFS CPU Scheduling Algorithm in Python

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CODE:

```
n=int(input("Enter the no.of proceses:"))
at=[]
bt=[]
pid=[]
for i in range(n):
  at.append(int(input(f"Enter the arrival time of processor {i+1}: ")))
  bt.append(int(input(f"Enter the burst time of processor {i+1}: ")))
  pid.append(f"P{i+1}")
print()
print("PID  AT  BT")
for i in range(n):
   print(f"P{i+1}   ", at[i], " ",bt[i])

d={}
for j in range(n):
  d[f"P{j+1}"]=[at[j],bt[j]]

print()
overhead=int(input("Enter the no.of overhead unit: "))
print()
d = sorted(d.items(), key=lambda item: item[1][0])

CT=[]
idle=0
st=""
for i in range(len(d)):

    if(i==0):
       v=d[i][1][1]
       CT.append(v)
       st+=("|"+"_"*v+str(d[i][0])+"|")

    elif CT[i-1]<d[i][1][0]:
       v1=CT[i-1] + d[i][1][1]
       idle+=((d[i][1][0]-CT[i-1])+overhead)
       CT.append(idle+ v1)
       st+=("*"*idle+"|")
```

```
        st+=("_"*(d[i][1][1])+str(d[i][0])+"|")

    else:
        v2=(CT[i-1] + d[i][1][1])
        CT.append(v2)
        st+=("*"*overhead+"|")
        st+=("_"*(d[i][1][1])+str(d[i][0])+"|")

TT = []
for i in range(len(d)):
    TT.append(CT[i] - d[i][1][0])

WT = []
for i in range(len(d)):
    WT.append(TT[i] - d[i][1][1])

AWT = 0
for i in WT:
    AWT +=i
AWT = (AWT/n)

ATT = 0
for i in TT:
    ATT +=i
ATT = (ATT/n)

print("GANTT CHART"+"\n")
print(st+"\n")

print("PID    AT        BT      CT       TT          WT   ")
print("-------------------------------------------------")
for p in pid:
 for i in range(len(d)):
   if p==d[i][0]:
      print(d[i][0],"      ",d[i][1][0],"     ",d[i][1][1],"     ",CT[i],"      ",
TT[i],"        ",WT[i],"     ")
print("Average Waiting Time: ",AWT)
print("Average Turnaround Time: ",ATT)
```

CODE:

(i) Question 1 (Tutorial)

```
PS C:\Users\B Vasundhara\Documents\OS> python3 3.py
Enter the no.of proceses:5
Enter the arrival time of processor 1: 4
Enter the burst time of processor 1: 5
Enter the arrival time of processor 2: 6
Enter the burst time of processor 2: 4
Enter the arrival time of processor 3: 0
Enter the burst time of processor 3: 3
Enter the arrival time of processor 4: 6
Enter the burst time of processor 4: 2
Enter the arrival time of processor 5: 5
Enter the burst time of processor 5: 4

PID  AT  BT
P1    4   5
P2    6   4
P3    0   3
P4    6   2
P5    5   4

Enter the no.of overhead unit: 0

GANTT CHART

|___P3|*|_____P1||____P5||____P2||__P4|
```

```
PID    AT        BT      CT       TT          WT
-----------------------------------------------
P1        4       5       9        5          0
P2        6       4       17        11          7
P3        0       3       3        3          0
P4        6       2       19        13          11
P5        5       4       13        8          4
Average Waiting Time:  4.4
Average Turnaround Time:  8.0
PS C:\Users\B Vasundhara\Documents\OS>
```

(ii) Question 2 (Tutorial)

```
PS C:\Users\B Vasundhara\Documents\OS> python3 3.py
Enter the no.of proceses:6
Enter the arrival time of processor 1: 0
Enter the burst time of processor 1: 3
Enter the arrival time of processor 2: 1
Enter the burst time of processor 2: 2
Enter the arrival time of processor 3: 2
Enter the burst time of processor 3: 1
Enter the arrival time of processor 4: 3
Enter the burst time of processor 4: 4
Enter the arrival time of processor 5: 4
Enter the burst time of processor 5: 5
Enter the arrival time of processor 6: 5
Enter the burst time of processor 6: 2

PID  AT  BT
P1    0   3
P2    1   2
P3    2   1
P4    3   4
P5    4   5
P6    5   2

Enter the no.of overhead unit: 1

GANTT CHART

|___P1|*|__P2|*|_P3|*|____P4|*|_____P5|*|__P6|
```

```
PID    AT        BT      CT       TT          WT
-------------------------------------------------
P1        0       3       3        3          0
P2        1       2       5        4          2
P3        2       1       6        4          3
P4        3       4       10        7          3
P5        4       5       15        11          6
P6        5       2       17        12          10
Average Waiting Time:  4.0
Average Turnaround Time:  6.833333333333333
PS C:\Users\B Vasundhara\Documents\OS>
```