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Subject & Section: CCOPSYSL – COM232
Professor: Mr. Gaudencio Jeffrey G. Romano

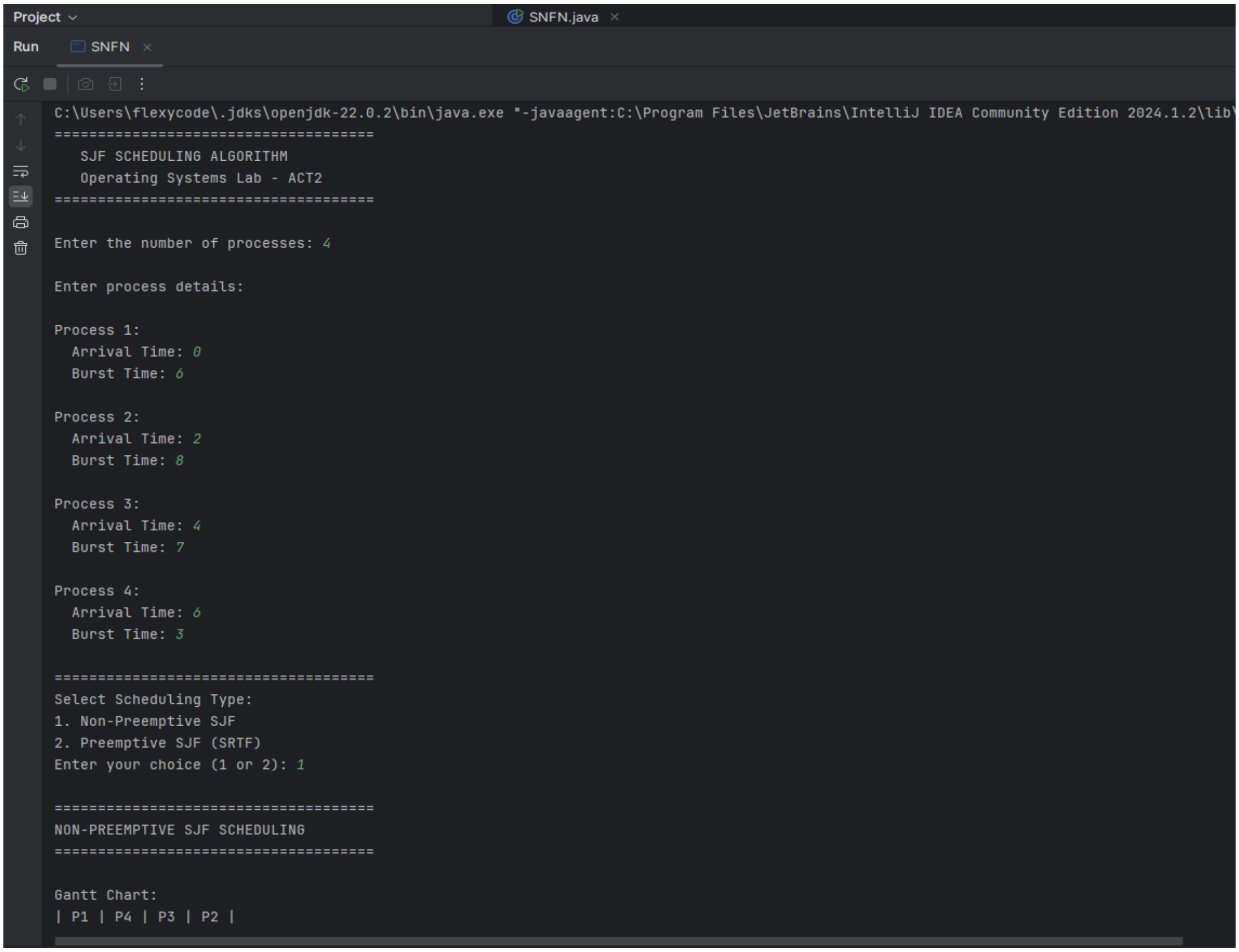
Laboratory #2: LAB-ACT2: SJF ALGORITHM

Instruction:

Make a program in java for SJF (Shortest Job First) algorithm.

Sample Input / Output Screenshot #1:

Number of processes: 4
Process details: (Arrival Time, Burst Time)
Selection of Scheduling Type: Non-Preemptive SJF
Choices: Non-Preemptive SJF or Preemptive SJF (SRTF) – Shortest Remaining Time First



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C:\Users\flexycode\.jdks\openjdk-22.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.1.2\lib\
=====================================
   SJF SCHEDULING ALGORITHM
   Operating Systems Lab - ACT2
=====================================

Enter the number of processes: 4

Enter process details:

Process 1:
  Arrival Time: 0
  Burst Time: 6

Process 2:
  Arrival Time: 2
  Burst Time: 8

Process 3:
  Arrival Time: 4
  Burst Time: 7

Process 4:
  Arrival Time: 6
  Burst Time: 3

=====================================
Select Scheduling Type:
1. Non-Preemptive SJF
2. Preemptive SJF (SRTF)
Enter your choice (1 or 2): 1

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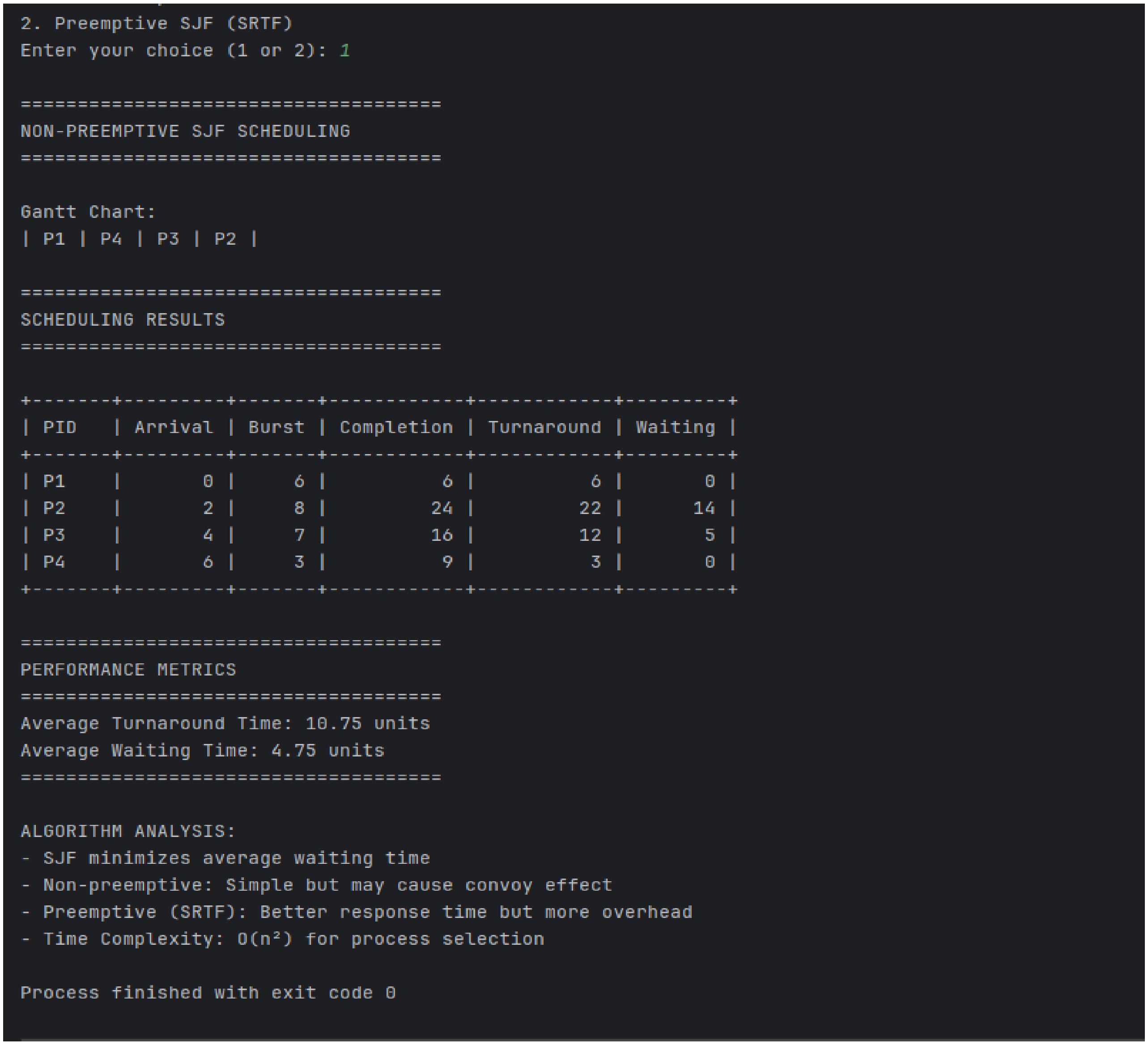
NON-PREEMPTIVE SJF SCHEDULING
=====================================

Gantt Chart:
| P1 | P4 | P3 | P2 |
```



```
2. Preemptive SJF (SRTF)
Enter your choice (1 or 2): 1

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NON-PREEMPTIVE SJF SCHEDULING
=====================================

Gantt Chart:
| P1 | P4 | P3 | P2 |

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SCHEDULING RESULTS
=====================================

+-------+---------+-------+------------+------------+---------+
| PID   | Arrival | Burst | Completion | Turnaround | Waiting |
+-------+---------+-------+------------+------------+---------+
| P1    |       0 |     6 |          6 |          6 |       0 |
| P2    |       2 |     8 |         24 |         22 |      14 |
| P3    |       4 |     7 |         16 |         12 |       5 |
| P4    |       6 |     3 |          9 |          3 |       0 |
+-------+---------+-------+------------+------------+---------+

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PERFORMANCE METRICS
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Average Turnaround Time: 10.75 units
Average Waiting Time: 4.75 units
=====================================

ALGORITHM ANALYSIS:
- SJF minimizes average waiting time
- Non-preemptive: Simple but may cause convoy effect
- Preemptive (SRTF): Better response time but more overhead
- Time Complexity: O(n²) for process selection

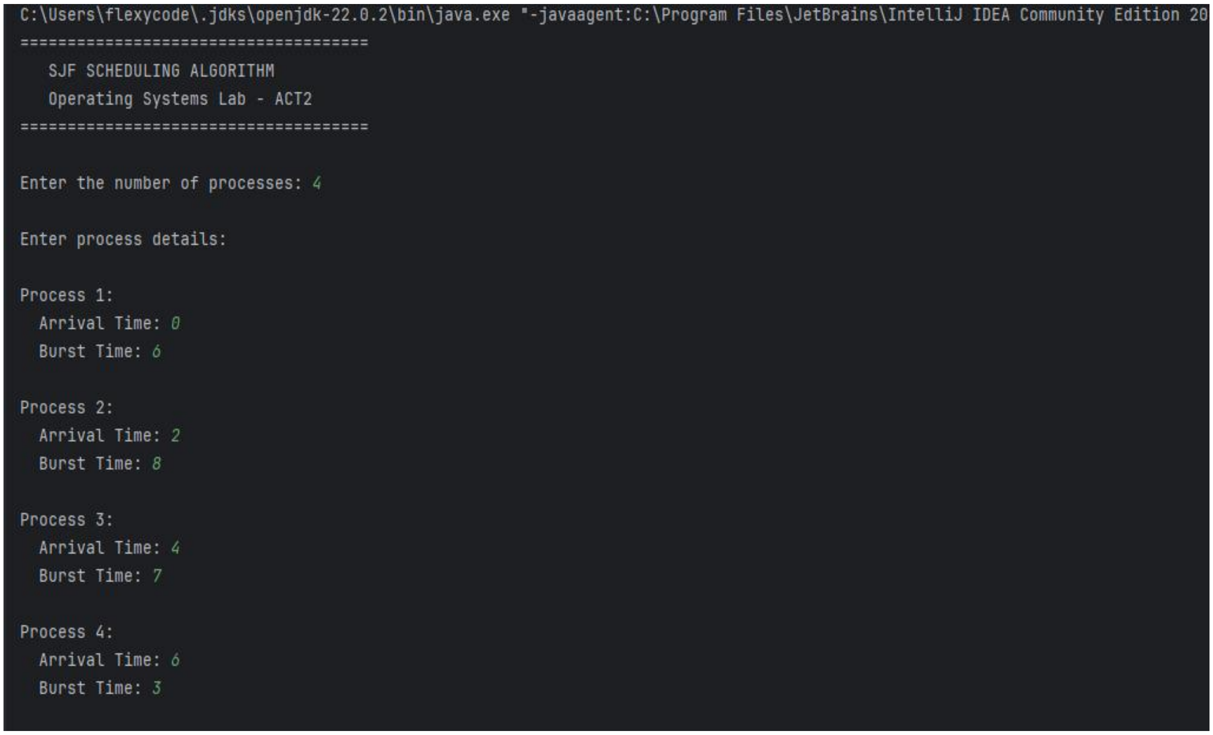
Process finished with exit code 0
```

Sample Input / Output Screenshot #2:

Number of processes: 4
Process details: (Arrival Time, Burst Time)

Process 1: 0, 6
Process 2: 2, 8
Process 3: 4, 7
Process 4: 6, 3

Selection of Scheduling Type: Preemptive SJF (SRTF) – Shortest Remaining Time First



```
C:\Users\flexycode\.jdks\openjdk-22.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 20
=====================================
   SJF SCHEDULING ALGORITHM
   Operating Systems Lab - ACT2
=====================================

Enter the number of processes: 4

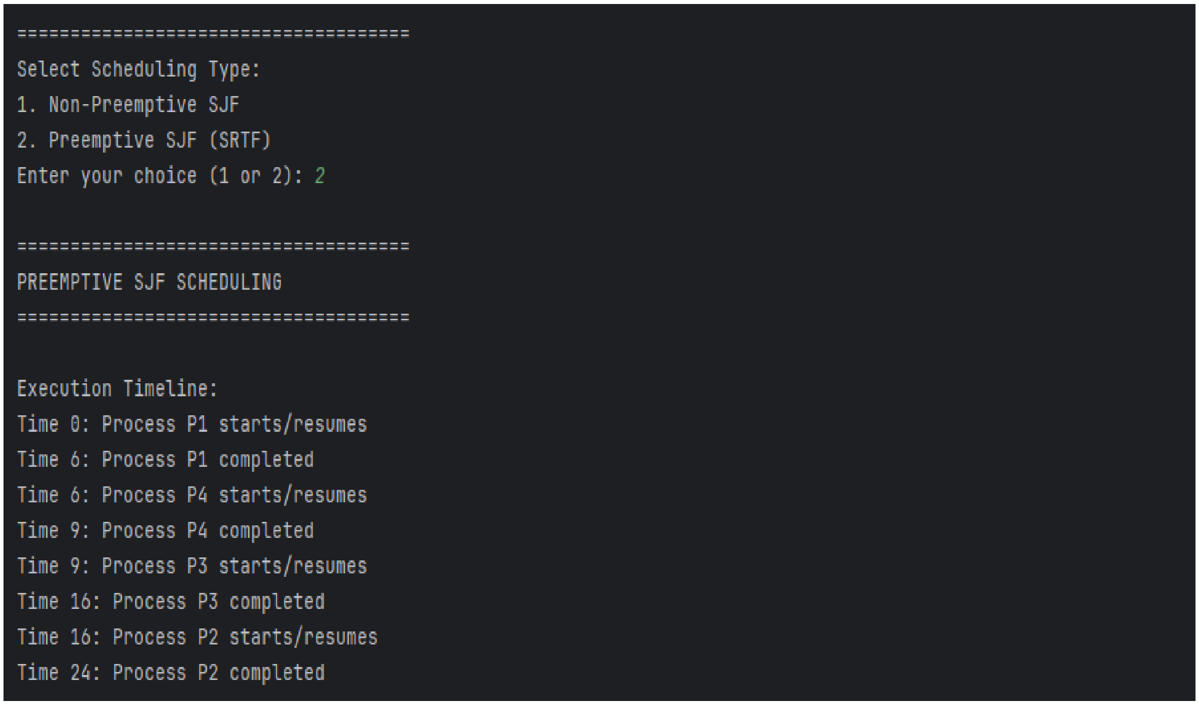
Enter process details:

Process 1:
  Arrival Time: 0
  Burst Time: 6

Process 2:
  Arrival Time: 2
  Burst Time: 8

Process 3:
  Arrival Time: 4
  Burst Time: 7

Process 4:
  Arrival Time: 6
  Burst Time: 3
```



```
=====================================
Select Scheduling Type:
1. Non-Preemptive SJF
2. Preemptive SJF (SRTF)
Enter your choice (1 or 2): 2

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PREEMPTIVE SJF SCHEDULING
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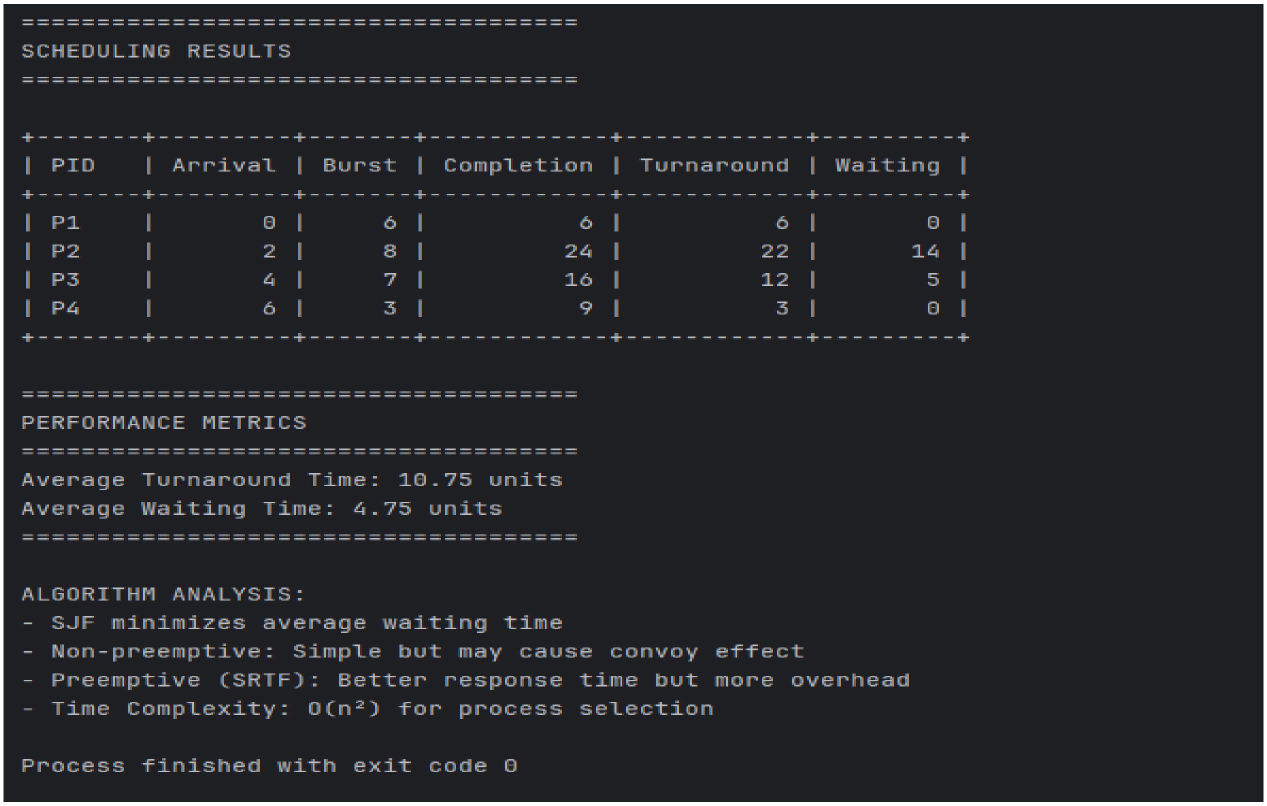
Execution Timeline:
Time 0: Process P1 starts/resumes
Time 6: Process P1 completed
Time 6: Process P4 starts/resumes
Time 9: Process P4 completed
Time 9: Process P3 starts/resumes
Time 16: Process P3 completed
Time 16: Process P2 starts/resumes
Time 24: Process P2 completed
```



```
=====================================
SCHEDULING RESULTS
=====================================

+-------+---------+-------+------------+------------+---------+
| PID   | Arrival | Burst | Completion | Turnaround | Waiting |
+-------+---------+-------+------------+------------+---------+
| P1    |       0 |     6 |          6 |          6 |       0 |
| P2    |       2 |     8 |         24 |         22 |      14 |
| P3    |       4 |     7 |         16 |         12 |       5 |
| P4    |       6 |     3 |          9 |          3 |       0 |
+-------+---------+-------+------------+------------+---------+

=====================================
PERFORMANCE METRICS
=====================================
Average Turnaround Time: 10.75 units
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ALGORITHM ANALYSIS:
- SJF minimizes average waiting time
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Process finished with exit code 0
```