Exercise 1

Schedule the following *n* jobs, where *pj* is the processing time on machine i. The goal is to minimize Cmax.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Job | J1 | J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 | J10 |
| *P1* | 5 | 3 | 6 | 8 | 4 | 12 | 12 | 5 | 3 | 2 |
| *P2* | 12 | 6 | 1 | 5 | 6 | 15 | 3 | 2 | 8 | 8 |
| *P3* | 1 | 20 | 2 | 5 | 7 | 11 | 12 | 2 | 5 | 4 |
| *P4* | 13 | 10 | 1 | 15 | 6 | 12 | 11 | 4 | 4 | 13 |
| *P5* | 2 | 6 | 2 | 1 | 5 | 13 | 2 | 7 | 18 | 3 |

As a first attempt, ask to an AI tool (such as chatgpt or gemini or others) directly the solution of the optimal schedule.

Verify that the solution that has been obtained is optimal or not, feasible or not, comparing with the solution obtained in a mathematical programming problem defined in Excel (or other spreadsheet tool with optimization module) or Lingo or Cplex or Matlab.

Organise the input/output information in a SQL database. Implement also a procedure to initialize new random instances of the problem on n jobs