**MTO**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Instance |  |  | Tardiness |  |  | Makespan |  | CPU Time |
|  |  | **(Order x Machine)** | **% Optimal values** |  | **Average (min)** |  | **Average (min)** |  | **Average (seconds)** |
| Genetic Algorithm | Symmetric setup time matrix | 1 | 70 x 8 | 98% |  | 0,2 |  | 1160,1 |  | 143,1 |
| 2 | 30 x 8 | 86% |  | 19,4 |  | 1018,2 |  | 17,1 |
| 3 | 40 x 8 | 48% |  | 46 |  | 1040,3 |  | 32,1 |
| 4 | 40 x 7 | 48% |  | 130,3 |  | 1950 |  | 34,9 |
| 5 | 100 x 8 | 0% |  | 718,4 |  | 2892,5 |  | 364,3 |
| Asymmetric setup time matrix | 1 | 70 x 8 | 96% |  | 9,2 |  | 1133,4 |  | 148,8 |
| 2 | 30 x 8 | 78% |  | 27,5 |  | 1123,2 |  | 19,4 |
| 3 | 40 x 8 | 84% |  | 3,1 |  | 837,9 |  | 34,9 |
| 4 | 40 x 7 | 0% |  | 164,6 |  | 1792 |  | 31,6 |
| 5 | 100 x 8 | 16% |  | 439 |  | 3031,9 |  | 426,7 |
| Tabu Search | Symmetric setup time matrix | 1 | 70 x 8 | 100% |  | 0 |  | 996 |  | 305 |
| 2 | 30 x 8 | 100% |  | 0 |  | 889 |  | 306 |
| 3 | 40 x 8 | 87% |  | 4 |  | 932 |  | 302 |
| 4 | 40 x 7 | 0% |  | 35 |  | 1880 |  | 301 |
| 5 | 100 x 8 | 0% |  | 426 |  | 2913 |  | 650 |
| Asymmetric setup time matrix | 1 | 70 x 8 | 100% |  | 0 |  | 970 |  | 302 |
| 2 | 30 x 8 | 0% |  | 40 |  | 1340 |  | 301 |
| 3 | 40 x 8 | 100% |  | 0 |  | 894 |  | 303 |
| 4 | 40 x 7 | 0% |  | 420 |  | 1845 |  | 307 |
| 5 | 100 x 8 | 100% |  | 0 |  | 2944 |  | 603 |

**MTS**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Instance | (Order x Machine) |  |  | Tardiness |  |  | Makespan |  | CPU Time |
|  |  | **# prod. orders** | **% Optimal values** |  | **Average (min)** |  | **Average (min)** |  | **Average (seconds)** |
| Genetic Algorithm | Symmetric setup time matrix | 1 | 70 x 8 | 24 | 100% |  | 0 |  | 2267 |  | 4,3 |
| 2 | 30 x 8 | 31 | 100% |  | 0 |  | 1196 |  | 9,1 |
| 3 | 40 x 8 | 28 | 100% |  | 0 |  | 4138,3 |  | 6,4 |
| 4 | 40 x 7 |  |  |  | 0 |  | 3832,4 |  | 14,3 |
| 5 | 100 x 8 | 65 | 94% |  | 424,6 |  | 5337,1 |  | 74,8 |
| Asymmetric setup time matrix | 1 | 70 x 8 | 24 | 100% |  | 0 |  | 1606 |  | 4,3 |
| 2 | 30 x 8 | 31 | 100% |  | 0 |  | 2365 |  | 9,1 |
| 3 | 40 x 8 | 28 | 100% |  | 0 |  | 2138,3 |  | 7,3 |
| 4 | 40 x 7 |  |  |  | 0 |  | 4838,3 |  | 14,1 |
| 5 | 100 x 8 | 65 | 100% |  | 0 |  | 5433,7 |  | 79,3 |
| Tabu Search | Symmetric setup time matrix | 1 | 70 x 8 | 24 | 100% |  | 0 |  | 1316 |  | 153 |
| 2 | 30 x 8 | 31 | 100% |  | 0 |  | 1183 |  | 192 |
| 3 | 40 x 8 | 28 | 100% |  | 0 |  | 1070 |  | 117 |
| 4 | 40 x 7 |  | 100% |  | 0 |  | 2032 |  | 301 |
| 5 | 100 x 8 | 65 | 100% |  | 0 |  | 3044 |  | 309 |
| Asymmetric setup time matrix | 1 | 70 x 8 | 24 | 100% |  | 0 |  | 1606 |  | 184 |
| 2 | 30 x 8 | 31 | 100% |  | 0 |  | 1270 |  | 202 |
| 3 | 40 x 8 | 28 | 100% |  | 0 |  | 909 |  | 165 |
| 4 | 40 x 7 |  | 100% |  | 0 |  | 2338 |  | 203 |
| 5 | 100 x 8 | 65 | 100% |  | 0 |  | 3344 |  | 287 |