COMSOAL

“COMputer Method for Sequencing Operations for Assembly Lines”

This algorithm randomly generates a large number (e.g., 1000) of feasible solutions, and selects the one using the fewest stations.

As in the Kilbridge & Wester and the RPWM algorithms, a solution is constructed by assigning tasks to stations, starting with the first station.

The next task to be assigned is selected at random from those which are candidates i.e.,

- performance time $\leq$ idle time remaining
- all predecessors assigned already

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Example: Cycle time = 15

![Diagram of a project network with nodes and arrows indicating task dependencies.]

**Trial 1**

Station 1

Randomly select 1 from candidate list: 1

*task 1 is the only task which has no predecessor*

Randomly select 3 from candidate list: 2 3 4 5 6

*tasks 2, 3, 4, 5, & 6 are the only tasks whose predecessors are already assigned, and whose times are less than the remaining idle time at station 1*
Station 2
Randomly select 2 from candidate list: 2 4 5 6
Randomly select 7 from candidate list: 4 5 6 7
Randomly select 10 from candidate list: 4 5 6 10

Station 3
Randomly select 6 from candidate list: 4 5 6
Randomly select 5 from candidate list: 4 5 14
Randomly select 4 from candidate list: 4 14

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Station 4
Randomly select 8 from candidate list: 8 9 14
Randomly select 9 from candidate list: 9 14
Randomly select 11 from candidate list: 11 14
Randomly select 12 from candidate list: 12 14
Randomly select 14 from candidate list: 14

Station 5
Randomly select 13 from candidate list: 13 15
Randomly select 16 from candidate list: 15 16
Randomly select 15 from candidate list: 15

Station 6
Randomly select 17 from candidate list: 17
Solution

Number of Stations: 6

<table>
<thead>
<tr>
<th>Station</th>
<th>Idle time</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1 3</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>2 7 10</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
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<td>8 9 11 12 14</td>
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<tr>
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<td>0</td>
<td>13 15 16</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>17</td>
</tr>
</tbody>
</table>

Balance delay: 0.177778

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