1 Original format

Documentation for the format is available at assembly-line-balancing.de. See the relevant document for a complete documentation. This document only serves as a reference for the extensions we made to the format.

2 Modifications

What modifications did we make?

- Create worker categories with a fixed number of workers per category.
- For every worker category: Assign a time modifier for every operation, where 1 is a normal time and any value smaller than 1 is faster. Can also be INF.
- Set a worker capacity per station as well as lower and upper bounds for workers per operation.
- Create modifiers for every possible number of workers per operation as with the individual time modifiers.

2.1 Stations

For SALBP-2 there must be a fixed number of stations. For our purposes they also have capacities.

```
<number of stations>
[int]

<station capacity>
[int: station nr]:[int: number of workers allowed]

example:
1:2
2:3
3:2
```

2.2 Worker categories

There are a fixed number of worker categories and workers per category available.

```
<number of worker categories>
[int]

<worker availability>
[int: category number]:[int: number of workers of that category available]

example:
1:5
2:2
3:4
```

2.3 Worker operation modifiers

Every worker can perform an operation in a certain time in relation to the original time needed. 1 indicates a normal time, anything smaller is faster. Can also be INF to indicate a worker cannot fulfill an operation.

```
<worker modifiers>
[int: task nr]:[int: category nr]:[float: modifier,
potentially INF];[int task nr]:...
[int: task nr + 1]:...

example:
1:1:1.0;1:2:1.1
2:1:0.9;2:2:INF
```

2.4 Multiple workers per operation

When multiple workers collaborate on the same operation, a different amount of time is expected. This could be slower or faster, see the individual modifiers. Additionally, an operation can only be fulfilled by a certain number of workers, e.g., when at least two workers are necessary.

```
<worker amount modifiers>
[int: task nr]:[int: number of workers]:[float: modifier, potentially INF
if not applicable];[int task nr]:...

example:
<worker amount modifiers>
1:1:1.0;    1:2:0.90
```

```
2:1:1.0;    2:2:0.92

<worker bounds>
[int: task nr]:[int: lower bound (incl)],[int: upper bound (incl)]

example:
<worker bounds>
1:1,2
2:1,2
3:1,2
```