**Problem – B (Assembly) 🡪 RESULTS**

**Test Instance-1:** TAS1C1D1 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_1)

// solution (optimal) with objective 6131.435

// Quality Incumbent solution:

// MILP objective 6.1314350000e+003

// MILP solution norm |x| (Total, Max) 7.46705e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 3.93641e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.94760e-014 1.42109e-014

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**Test Instance-2:** TAS1C1D2 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_2)

// solution (optimal) with objective 6132.959

// Quality Incumbent solution:

// MILP objective 6.1329590000e+003

// MILP solution norm |x| (Total, Max) 7.61948e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 4.12115e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.56319e-013 2.84217e-014

//

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**Test Instance-3:** TAS1C1D3 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_3)

// solution (optimal) with objective 6136.3118

// Quality Incumbent solution:

// MILP objective 6.1363118000e+003

// MILP solution norm |x| (Total, Max) 7.95484e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 3.75167e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 1.42109e-014

//

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**Test Instance-4:** TAS1C1D4 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_4)

// solution (optimal) with objective 6131.857

// Quality Incumbent solution:

// MILP objective 6.1318570000e+003

// MILP solution norm |x| (Total, Max) 7.48022e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.97904e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.98952e-013 2.84217e-014

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 5 5 0 5 0 5]

[0 0 0 0 5 15 15 0 15 0 15 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-5:** TAS1C1D5 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_5)

// solution (optimal) with objective 6139.7334

// Quality Incumbent solution:

// MILP objective 6.1397334000e+003

// MILP solution norm |x| (Total, Max) 7.83026e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 3.92220e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.84217e-014 2.84217e-014

//

productionquantity = [[[0

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[1 0 0 100.81 0 0 0 100.02 0 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 100.81 100.02 0 0 100 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[135 0 0 0 0]

[135 0 0 0 0]

[136 0 0 0 0]

[136 0 0 0 0]

[435.83 300.83 200.02 100 0]

[436.83 300.83 200.02 100 0]

[236.81 100.81 0 0 0]

[435.83 299.83 200.02 100 0]

[422.4 286.4 185.59 92.779 0]

[436.83 300.83 200.02 100 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]];

stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 5 0 0 5 0 5 0 0]

[10 10 10 10 0 0 10 0 15 0 10 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 5 5 0 5 0 5]

[0 0 0 0 5 15 15 0 15 0 15 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-6:** TAS1C1D6 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_6)

// solution (optimal) with objective 6157.0608

// Quality Incumbent solution:

// MILP objective 6.1570608000e+003

// MILP solution norm |x| (Total, Max) 8.60034e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 3.99325e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 1.42109e-014

//

productionquantity = [[[0

0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 102.48 0 0 100.06 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 102.48 0 0 0 100.06 0 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 102.48 0 0 0 100.06 0 100 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 102.48 100.06 0 0 100 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 100.06 0 0 1 0 99.001]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[209.25 0 0 0 0]

[209.25 0 0 0 0]

[210.25 0 0 0 0]

[210.25 0 0 0 0]

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[512.79 302.54 200.06 100 0]

[312.73 102.48 0 0 0]

[511.79 301.54 200.06 100 0]

[498.4 288.15 185.67 92.78 0]

[512.79 302.54 200.06 100 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-7:** TAS1C1D7 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_7)

// solution (optimal) with objective 6133.0424

// Quality Incumbent solution:

// MILP objective 6.1330424000e+003

// MILP solution norm |x| (Total, Max) 7.49960e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 3.69482e-013 5.68434e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 0.00000e+000 0.00000e+000

//

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**Test Instance-8:** TAS1C1D8 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_8)

// solution (optimal) with objective 6158.662

// Quality Incumbent solution:

// MILP objective 6.1586620000e+003

// MILP solution norm |x| (Total, Max) 8.14022e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 3.86535e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.68434e-014 1.42109e-014

//

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B\_setuptime = [[0 0 0 0 0 0 5 5 0 5 0 5]

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**Test Instance-9:** TAS1C1D9 (Test Assembly Setup-Profile\_1 Capacity-Profile\_1 Demand-Series\_9)

// solution (optimal) with objective 6215.026

// Quality Incumbent solution:

// MILP objective 6.2150260000e+003

// MILP solution norm |x| (Total, Max) 9.54958e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 4.54747e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.70530e-013 5.68434e-014

//

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B\_setuptime = [[0 0 0 0 0 0 5 0 0 5 5 5]

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**Test Instance-10:** TAS1C2D1 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_1)

// solution (optimal) with objective 6026.6729

// Quality Incumbent solution:

// MILP objective 6.0266729000e+003

// MILP solution norm |x| (Total, Max) 7.29845e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 7.38964e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 5 5 5 5 5]

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**Test Instance-11:** TAS1C2D2 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_2)

// solution (optimal) with objective 6028.1969

// Quality Incumbent solution:

// MILP objective 6.0281969000e+003

// MILP solution norm |x| (Total, Max) 7.44488e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 2.27374e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 2.84217e-014

//

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**Test Instance-12:** TAS1C2D3 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_3)

// solution (optimal) with objective 6031.5497

// Quality Incumbent solution:

// MILP objective 6.0315497000e+003

// MILP solution norm |x| (Total, Max) 7.78023e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 7.38964e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.56319e-013 2.84217e-014

//

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**Test Instance-13:** TAS1C2D4 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_4)

// solution (optimal) with objective 6027.0949

// Quality Incumbent solution:

// MILP objective 6.0270949000e+003

// MILP solution norm |x| (Total, Max) 7.30562e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 7.44649e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.98952e-013 2.84217e-014

//

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[0 0 0 0 0 0 0 0 0 0 0 0]];

stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 5 0 5 0 0 5 5 0]

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[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 5 5 0 0]

[0 0 0 0 5 15 10 15 15 15 10 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-14:** TAS1C2D5 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_5)

// solution (optimal) with objective 6034.9713

// Quality Incumbent solution:

// MILP objective 6.0349713000e+003

// MILP solution norm |x| (Total, Max) 7.65566e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 1.11982e-011 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.84217e-014 1.42109e-014

//

productionquantity = [[[0

0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 100.81 0 0 100.02 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 100.81 0 0 100.02 0 0 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 100.81 0 0 0 100.02 100 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 100.81 0 100.02 0 0 100 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 140.14 0 0 41.142 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 1 0 0 0 0 0 100]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 1 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[135 0 0 0 0]

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[436.83 300.83 200.02 100 0]

[255.54 119.54 18.733 58.858 0]

[434.83 298.83 198.02 99 0]

[335.83 199.83 100.02 0 0]

[435.83 299.83 199.02 100 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 1 1 1 1 1 1 1 1 1 1 1]]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 5 0 5 0 0 5 5 0]

[10 10 10 10 0 0 0 0 0 5 0 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 5 5 0 0]

[0 0 0 0 5 15 10 15 15 15 10 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-15:** TAS1C2D6 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_6)

// solution (optimal) with objective 6052.2987

// Quality Incumbent solution:

// MILP objective 6.0522987000e+003

// MILP solution norm |x| (Total, Max) 8.42574e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 1.10845e-011 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 1.42109e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 102.48 0 0 100.06 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 102.48 0 0 100.06 0 0 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 102.48 0 0 0 100.06 100 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 102.48 0 100.06 0 0 100 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 140.14 0 0 41.142 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[209.25 0 0 0 0]

[209.25 0 0 0 0]

[210.25 0 0 0 0]

[210.25 0 0 0 0]

[511.79 302.54 200.06 100 0]

[512.79 302.54 200.06 100 0]

[331.5 121.25 18.773 58.86 0]

[511.79 301.54 199.06 99.001 0]

[410.79 200.54 99.056 0 0]

[511.79 301.54 199.06 100 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-16:** TAS1C2D7 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_7)

// solution (optimal) with objective 6028.2803

// Quality Incumbent solution:

// MILP objective 6.0282803000e+003

// MILP solution norm |x| (Total, Max) 7.32499e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 1.98952e-013 4.26326e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.84217e-014 1.42109e-014

//

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**Test Instance-17:** TAS1C2D8 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_8)

// solution (optimal) with objective 6053.8999

// Quality Incumbent solution:

// MILP objective 6.0538999000e+003

// MILP solution norm |x| (Total, Max) 7.96561e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 7.54596e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

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B\_setuptime = [[0 0 0 0 0 0 5 0 5 5 5 0]

[0 0 0 0 5 15 10 15 15 15 15 10]

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**Test Instance-18:** TAS1C2D9 (Test Assembly Setup-Profile\_1 Capacity-Profile\_2 Demand-Series\_9)

// solution (optimal) with objective 6110.2639

// Quality Incumbent solution:

// MILP objective 6.1102639000e+003

// MILP solution norm |x| (Total, Max) 9.37497e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 2.84217e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 2.84217e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]]

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[296 0 0 0 0]

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[422.89 126.89 19.053 58.882 0]

[602.17 306.17 198.33 99.013 0]

[503.15 207.15 100.31 0 0]

[603.17 307.17 199.33 100.01 0]];

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 5 0 5 0 0 0 5 0]

[10 10 10 10 0 0 0 0 0 0 0 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 5 5 5 0]

[0 0 0 0 5 15 10 15 15 15 15 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-19:** TAS1C3D1 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_1)

// solution (optimal) with objective 5838.1016

// Quality Incumbent solution:

// MILP objective 5.8381016000e+003

// MILP solution norm |x| (Total, Max) 6.98416e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 3.75167e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

productionquantity = [[[0

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[1 0 0 0 100.01 0 0 100 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 100.01 0 0 100 0 0 100 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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**Test Instance-20:** TAS1C3D2 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_2)

// solution (optimal) with objective 5839.6256

// Quality Incumbent solution:

// MILP objective 5.8396256000e+003

// MILP solution norm |x| (Total, Max) 7.13660e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 4.97380e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.84217e-013 1.59872e-013

//

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**Test Instance-21:** TAS1C3D3 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_3)

// solution (optimal) with objective 5842.9784

// Quality Incumbent solution:

// MILP objective 5.8429784000e+003

// MILP solution norm |x| (Total, Max) 7.47195e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 3.85114e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 2.84217e-014

//

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**Test Instance-22:** TAS1C3D4 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_4)

// solution (optimal) with objective 5838.5236

// Quality Incumbent solution:

// MILP objective 5.8385236000e+003

// MILP solution norm |x| (Total, Max) 6.99733e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.78009e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.70530e-013 2.84217e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 5 5 5 5]

[0 0 0 0 5 15 15 10 15 10 15 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-23:** TAS1C3D5 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_5)

// solution (optimal) with objective 5846.4

// Quality Incumbent solution:

// MILP objective 5.8464000000e+003

// MILP solution norm |x| (Total, Max) 7.34737e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 7.53175e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.68434e-014 2.84217e-014

//

productionquantity = [[[0

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[[0 0 0 0 0 0 100.02 0 0 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[135 0 0 0 0]

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[436.83 300.83 200.02 100 0]

[236.81 100.81 0 0 0]

[431.83 295.83 195.02 95.001 0]

[431.87 295.87 195.05 100 0]

[236.81 100.81 0 0 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 10 0 5 0 5 0 0 0]

[10 10 10 0 0 0 5 10 0 0 0 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 5 0 5 0 5 5]

[0 0 0 5 15 10 15 10 0 10 15 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-24:** TAS1C3D6 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_6)

// solution (optimal) with objective 5863.7274

// Quality Incumbent solution:

// MILP objective 5.8637274000e+003

// MILP solution norm |x| (Total, Max) 8.11745e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 1.13403e-011 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 1.42109e-014

//

productionquantity = [[[0

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[1 0 0 0 102.48 0 0 100.06 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[209.25 0 0 0 0]

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[411.79 201.54 99.056 0 0]

[512.79 302.54 200.06 100 0]

[403.85 193.6 91.116 95.004 0]

[312.73 102.48 0 0 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-25:** TAS1C3D7 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_7)

// solution (optimal) with objective 5839.709

// Quality Incumbent solution:

// MILP objective 5.8397090000e+003

// MILP solution norm |x| (Total, Max) 7.01671e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 2.84217e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.68434e-014 2.84217e-014

//

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**Test Instance-26:** TAS1C3D8 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_8)

// solution (optimal) with objective 5865.3286

// Quality Incumbent solution:

// MILP objective 5.8653286000e+003

// MILP solution norm |x| (Total, Max) 7.65733e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 7.53175e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.94760e-014 2.84217e-014

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 0 5 0 0 5 0]

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**Test Instance-27:** TAS1C3D9 (Test Assembly Setup-Profile\_1 Capacity-Profile\_3 Demand-Series\_9)

// solution (optimal) with objective 5921.6926

// Quality Incumbent solution:

// MILP objective 5.9216926000e+003

// MILP solution norm |x| (Total, Max) 9.06669e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 2.71783e-013 8.52651e-014

// MILP x bound error (Total, Max) 2.66454e-015 2.66454e-015

// MILP x integrality error (Total, Max) 5.32907e-015 2.66454e-015

// MILP slack bound error (Total, Max) 2.08722e-013 3.90799e-014

//

productionquantity = [[[0

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[410.47 114.47 6.6272 0 0]

[487.88 191.88 84.038 95.038 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 0 10 10 10 0 0 0 0 0 5 0]

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B\_setuptime = [[0 0 10 0 0 0 5 5 5 5 5 0]

[0 0 10 5 15 10 15 10 15 10 15 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-28:** TAS1C4D1 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_1)

// solution (optimal) with objective 6131.435

// Quality Incumbent solution:

// MILP objective 6.1314350000e+003

// MILP solution norm |x| (Total, Max) 7.47205e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 3.75167e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 2.84217e-014

//

productionquantity = [[[0

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B\_setuptime = [[0 0 0 0 0 0 0 0 5 5 5 0]

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**Test Instance-29:** TAS1C4D2 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_2)

// solution (optimal) with objective 6132.959

// Quality Incumbent solution:

// MILP objective 6.1329590000e+003

// MILP solution norm |x| (Total, Max) 7.62448e+003 4.15162e+002

// MILP solution error (Ax=b) (Total, Max) 1.70530e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.84741e-013 2.84217e-014

//

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**Test Instance-30:** TAS1C4D3 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_3)

// solution (optimal) with objective 6136.3118

// Quality Incumbent solution:

// MILP objective 6.1363118000e+003

// MILP solution norm |x| (Total, Max) 7.95984e+003 4.48495e+002

// MILP solution error (Ax=b) (Total, Max) 7.65343e-012 1.83320e-012

// MILP x bound error (Total, Max) 1.77636e-015 8.88178e-016

// MILP x integrality error (Total, Max) 5.55112e-015 2.44249e-015

// MILP slack bound error (Total, Max) 7.60125e-012 7.27596e-012

//

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**Test Instance-31:** TAS1C4D4 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_4)

// solution (optimal) with objective 6131.857

// Quality Incumbent solution:

// MILP objective 6.1318570000e+003

// MILP solution norm |x| (Total, Max) 7.48522e+003 4.01302e+002

// MILP solution error (Ax=b) (Total, Max) 7.62068e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.77636e-015 8.88178e-016

// MILP x integrality error (Total, Max) 2.99760e-015 9.99201e-016

// MILP slack bound error (Total, Max) 1.12689e-011 7.27596e-012

//

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B\_setuptime = [[0 0 0 0 0 0 5 0 5 0 0 5]

[0 0 0 0 5 0 15 15 10 15 10 15]

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**Test Instance-32:** TAS1C4D5 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_5)

// solution (optimal) with objective 6139.7334

// Quality Incumbent solution:

// MILP objective 6.1397334000e+003

// MILP solution norm |x| (Total, Max) 7.83526e+003 4.35829e+002

// MILP solution error (Ax=b) (Total, Max) 4.19975e-012 1.81899e-012

// MILP x bound error (Total, Max) 4.88498e-015 1.77636e-015

// MILP x integrality error (Total, Max) 4.88498e-015 1.77636e-015

// MILP slack bound error (Total, Max) 1.84532e-011 1.81899e-011

//

productionquantity = [[[0

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inventory = [[135 0 0 0 0]

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E\_setuptime = [[10 10 10 10 10 0 5 0 5 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 5 0 5 0 5 5]

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**Test Instance-33:** TAS1C4D6 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_6)

// solution (optimal) with objective 6157.0608

// Quality Incumbent solution:

// MILP objective 6.1570608000e+003

// MILP solution norm |x| (Total, Max) 8.60534e+003 5.11788e+002

// MILP solution error (Ax=b) (Total, Max) 4.46954e-012 1.83853e-012

// MILP x bound error (Total, Max) 6.66134e-015 3.55271e-015

// MILP x integrality error (Total, Max) 8.65974e-015 3.55271e-015

// MILP slack bound error (Total, Max) 5.45342e-013 7.28306e-014

//

productionquantity = [[[0

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**Test Instance-34:** TAS1C4D7 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_7)

// solution (optimal) with objective 6133.0424

// Quality Incumbent solution:

// MILP objective 6.1330424000e+003

// MILP solution norm |x| (Total, Max) 7.49960e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 2.84217e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.84217e-014 1.42109e-014

//

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**Test Instance-35:** TAS1C4D8 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_8)

// solution (optimal) with objective 6158.662

// Quality Incumbent solution:

// MILP objective 6.1586620000e+003

// MILP solution norm |x| (Total, Max) 8.14522e+003 4.65666e+002

// MILP solution error (Ax=b) (Total, Max) 7.50333e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.68434e-014 1.42109e-014

//

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B\_setuptime = [[0 0 10 0 0 0 0 0 0 0 0 5]

[0 0 10 0 5 15 15 10 10 10 15 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-36:** TAS1C4D9 (Test Assembly Setup-Profile\_1 Capacity-Profile\_4 Demand-Series\_9)

// solution (optimal) with objective 6215.026

// Quality Incumbent solution:

// MILP objective 6.2150260000e+003

// MILP solution norm |x| (Total, Max) 9.55458e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 4.01701e-012 1.81899e-012

// MILP x bound error (Total, Max) 3.33067e-015 2.88658e-015

// MILP x integrality error (Total, Max) 7.10543e-015 2.88658e-015

// MILP slack bound error (Total, Max) 4.10760e-012 3.63798e-012

//

productionquantity = [[[0

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 5 0 5 5 5 5]

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**Test Instance-37:** TAS1C5D1 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_1)

// solution (optimal) with objective 5838.1016

// Quality Incumbent solution:

// MILP objective 5.8381016000e+003

// MILP solution norm |x| (Total, Max) 6.98416e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 3.96927e-012 1.81544e-012

// MILP x bound error (Total, Max) 4.44089e-016 4.44089e-016

// MILP x integrality error (Total, Max) 4.32987e-015 1.99840e-015

// MILP slack bound error (Total, Max) 1.69087e-013 3.01981e-014

//

productionquantity = [[[0

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**Test Instance-38:** TAS1C5D2 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_2)

// solution (optimal) with objective 5839.6256

// Quality Incumbent solution:

// MILP objective 5.8396256000e+003

// MILP solution norm |x| (Total, Max) 7.13660e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 2.27374e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 2.84217e-014

//

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**Test Instance-39:** TAS1C5D3 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_3)

// solution (optimal) with objective 5842.9784

// Quality Incumbent solution:

// MILP objective 5.8429784000e+003

// MILP solution norm |x| (Total, Max) 7.47195e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 3.75167e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.56319e-013 2.84217e-014

//

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**Test Instance-40:** TAS1C5D4 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_4)

// solution (optimal) with objective 5838.5236

// Quality Incumbent solution:

// MILP objective 5.8385236000e+003

// MILP solution norm |x| (Total, Max) 6.99733e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.80851e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.70530e-013 2.84217e-014

//

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B\_setuptime = [[0 0 0 0 0 0 0 0 0 5 0 5]

[0 0 0 0 5 0 15 10 15 15 15 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-41:** TAS1C5D5 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_5)

// solution (optimal) with objective 5846.4

// Quality Incumbent solution:

// MILP objective 5.8464000000e+003

// MILP solution norm |x| (Total, Max) 7.34737e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 7.56017e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.68434e-014 2.84217e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 100.81 0 0 100.02 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 100.81 0 0 0 100.02 0 0 100 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 100.81 0 0 100.02 100 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 100.81 0 100.02 0 0 0 0 100]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 103.98 0 1 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 100.02 0 100 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[135 0 0 0 0]

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[136 0 0 0 0]

[136 0 0 0 0]

[435.83 300.83 200.02 100 0]

[436.83 300.83 200.02 100 0]

[336.83 200.83 100.02 0 0]

[431.83 295.83 195.02 95.001 0]

[331.85 195.85 95.037 100 0]

[236.81 100.81 0 0 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 10 5 0 5 5 0 5 0]

[10 10 10 10 0 0 10 0 15 10 15 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 0 5 0 0 5 0]

[0 0 0 0 5 15 15 0 15 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-42:** TAS1C5D6 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_6)

// solution (optimal) with objective 5863.7274

// Quality Incumbent solution:

// MILP objective 5.8637274000e+003

// MILP solution norm |x| (Total, Max) 8.11745e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 3.80851e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.27898e-013 1.42109e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 102.48 0 0 100.06 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 102.48 0 0 0 0 100.06 0 100 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 102.48 0 100.06 0 0 0 0 100]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 102.48 0 100.06 0 100 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 100 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]];

inventory = [[209.25 0 0 0 0]

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[210.25 0 0 0 0]

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[411.79 201.54 99.056 0 0]

[503.85 293.6 191.12 100 0]

[412.79 202.54 100.06 0 0]

[312.73 102.48 0 95.004 0]];

Pchangeover = [[[[0 0 0 0 0 0 0 0 0 0 0 0]

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**Test Instance-43:** TAS1C5D7 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_7)

// solution (optimal) with objective 5839.709

// Quality Incumbent solution:

// MILP objective 5.8397090000e+003

// MILP solution norm |x| (Total, Max) 7.01671e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 3.83693e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 5.68434e-014 2.84217e-014

//

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**Test Instance-44:** TAS1C5D8 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_8)

// solution (optimal) with objective 5865.3286

// Quality Incumbent solution:

// MILP objective 5.8653286000e+003

// MILP solution norm |x| (Total, Max) 7.65733e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 3.86535e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 0 0 0 0 0 5 5 5 0 5 0]

[0 0 0 0 5 15 15 10 15 10 15 10]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-45:** TAS1C5D9 (Test Assembly Setup-Profile\_1 Capacity-Profile\_5 Demand-Series\_9)

// solution (optimal) with objective 5921.6926

// Quality Incumbent solution:

// MILP objective 5.9216926000e+003

// MILP solution norm |x| (Total, Max) 9.06669e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 2.84217e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.94760e-014 2.84217e-014

//

productionquantity = [[[0

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 10 10 10 10 5 5 5 5 5 5 0]

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[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 5 15 10 15 10 10 5 15]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Setup Profile – II**

**Test Instance-1:** TAS2C1D1 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_1)

// solution (optimal) with objective 6176.435

// Quality Incumbent solution:

// MILP objective 6.1764350000e+003

// MILP solution norm |x| (Total, Max) 7.51805e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 7.36122e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 9.94760e-014 1.42109e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 100.01 0 0 100 0 100 0 0]]

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[401.01 300.01 200 100 0]

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**Test Instance-2:** TAS2C1D2 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_2)

// solution (optimal) with objective 6177.959

// Quality Incumbent solution:

// MILP objective 6.1779590000e+003

// MILP solution norm |x| (Total, Max) 7.67048e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 2.44693e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 8.88178e-016 4.44089e-016

// MILP slack bound error (Total, Max) 1.51879e-013 2.84217e-014

//

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**Test Instance-3:** TAS2C1D3 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_3)

// solution (optimal) with objective 6181.3118

// Quality Incumbent solution:

// MILP objective 6.1813118000e+003

// MILP solution norm |x| (Total, Max) 8.00584e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 3.77542e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.22045e-015 1.11022e-015

// MILP x integrality error (Total, Max) 2.22045e-015 1.11022e-015

// MILP slack bound error (Total, Max) 2.10054e-013 1.42109e-014

//

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B\_setuptime = [[0 10 10 10 10 10 0 0 0 10 10 10]

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**Test Instance-4:** TAS2C1D4 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_4)

// solution (optimal) with objective 6176.857

// Quality Incumbent solution:

// MILP objective 6.1768570000e+003

// MILP solution norm |x| (Total, Max) 7.53122e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.79430e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.27374e-013 2.84217e-014

//

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B\_setuptime = [[0 10 10 10 10 10 0 0 0 10 10 10]

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**Test Instance-5:** TAS2C1D5 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_5)

// solution (optimal) with objective 6184.7334

// Quality Incumbent solution:

// MILP objective 6.1847334000e+003

// MILP solution norm |x| (Total, Max) 7.88126e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 3.89266e-012 3.63798e-012

// MILP x bound error (Total, Max) 2.22045e-016 2.22045e-016

// MILP x integrality error (Total, Max) 2.22045e-016 2.22045e-016

// MILP slack bound error (Total, Max) 7.32747e-015 1.77636e-015

//

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**Test Instance-6:** TAS2C1D6 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_6)

// solution (optimal) with objective 6202.0608

// Quality Incumbent solution:

// MILP objective 6.2020608000e+003

// MILP solution norm |x| (Total, Max) 8.65134e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 7.41807e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 1.42109e-014

//

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**Test Instance-7:** TAS2C1D7 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_7)

// solution (optimal) with objective 6178.0424

// Quality Incumbent solution:

// MILP objective 6.1780424000e+003

// MILP solution norm |x| (Total, Max) 7.55060e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 1.57208e-013 4.26326e-014

// MILP x bound error (Total, Max) 2.22045e-016 2.22045e-016

// MILP x integrality error (Total, Max) 2.22045e-016 2.22045e-016

// MILP slack bound error (Total, Max) 2.06501e-014 1.42109e-014

//

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**Test Instance-8:** TAS2C1D8 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_8)

// solution (optimal) with objective 6203.662

// Quality Incumbent solution:

// MILP objective 6.2036620000e+003

// MILP solution norm |x| (Total, Max) 8.19122e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 3.91442e-012 3.63798e-012

// MILP x bound error (Total, Max) 4.88498e-015 2.44249e-015

// MILP x integrality error (Total, Max) 4.88498e-015 2.44249e-015

// MILP slack bound error (Total, Max) 2.23377e-013 1.42109e-014

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 10 10 10 10 10 0 0 0 10 10 10]

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**Test Instance-9:** TAS2C1D9 (Test Assembly Setup-Profile\_2 Capacity-Profile\_1 Demand-Series\_9)

// solution (optimal) with objective 6260.026

// Quality Incumbent solution:

// MILP objective 6.2600260000e+003

// MILP solution norm |x| (Total, Max) 9.60058e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 2.55795e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 2.84217e-014

//

productionquantity = [[[0

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[0 0 0 0 0 10 10 10 0 0 0 0]

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B\_setuptime = [[0 10 10 10 10 10 0 0 0 10 10 10]

[0 10 10 0 0 0 0 5 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-10:** TAS2C2D1 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_1)

// solution (optimal) with objective 6071.6729

// Quality Incumbent solution:

// MILP objective 6.0716729000e+003

// MILP solution norm |x| (Total, Max) 7.34345e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 3.90799e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

productionquantity = [[[0

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inventory = [[100 0 0 0 0]

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**Test Instance-11:** TAS2C2D2 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_2)

// solution (optimal) with objective 6073.1969

// Quality Incumbent solution:

// MILP objective 6.0731969000e+003

// MILP solution norm |x| (Total, Max) 7.49588e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 1.12070e-011 3.63798e-012

// MILP x bound error (Total, Max) 2.22045e-016 2.22045e-016

// MILP x integrality error (Total, Max) 4.44089e-016 2.22045e-016

// MILP slack bound error (Total, Max) 1.46771e-013 2.84217e-014

//

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**Test Instance-12:** TAS2C2D3 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_3)

// solution (optimal) with objective 6076.5497

// Quality Incumbent solution:

// MILP objective 6.0765497000e+003

// MILP solution norm |x| (Total, Max) 7.83123e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 7.44804e-012 3.63798e-012

// MILP x bound error (Total, Max) 3.33067e-015 2.22045e-015

// MILP x integrality error (Total, Max) 3.55271e-015 2.22045e-015

// MILP slack bound error (Total, Max) 2.51354e-013 1.42109e-014

//

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B\_setuptime = [[0 10 10 10 10 10 0 10 0 0 0 10]

[0 10 10 0 0 0 0 0 0 5 5 0]

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**Test Instance-13:** TAS2C2D4 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_4)

// solution (optimal) with objective 6072.0949

// Quality Incumbent solution:

// MILP objective 6.0720949000e+003

// MILP solution norm |x| (Total, Max) 7.35662e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.95062e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.13163e-013 2.84217e-014

//

productionquantity = [[[0

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 0 0 0 0 10 5 10 0 10 0 0]

[10 0 5 10 5 0 5 5 5 5 10 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 10 10 10 10 0 5 0 10 0 10]

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**Test Instance-14:** TAS2C2D5 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_5)

// solution (optimal) with objective 6079.9713

// Quality Incumbent solution:

// MILP objective 6.0799713000e+003

// MILP solution norm |x| (Total, Max) 7.70666e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 3.78009e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 0.00000e+000 0.00000e+000

//

productionquantity = [[[0

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**Test Instance-15:** TAS2C2D6 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_6)

// solution (optimal) with objective 6097.2987

// Quality Incumbent solution:

// MILP objective 6.0972987000e+003

// MILP solution norm |x| (Total, Max) 8.47674e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 3.95772e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.56319e-013 1.42109e-014

//

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**Test Instance-16:** TAS2C2D7 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_7)

// solution (optimal) with objective 6073.2803

// Quality Incumbent solution:

// MILP objective 6.0732803000e+003

// MILP solution norm |x| (Total, Max) 7.37599e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 3.76588e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.84217e-014 2.84217e-014

//

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**Test Instance-17:** TAS2C2D8 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_8)

// solution (optimal) with objective 6098.8999

// Quality Incumbent solution:

// MILP objective 6.0988999000e+003

// MILP solution norm |x| (Total, Max) 8.01661e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 3.73745e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 10 10 10 10 10 0 10 10 10 0 10]

[0 10 10 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-18:** TAS2C2D9 (Test Assembly Setup-Profile\_2 Capacity-Profile\_2 Demand-Series\_9)

// solution (optimal) with objective 6155.2639

// Quality Incumbent solution:

// MILP objective 6.1552639000e+003

// MILP solution norm |x| (Total, Max) 9.42597e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 4.01457e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 2.84217e-014

//

productionquantity = [[[0

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[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 107.84 0 0 100.31 0 100.01 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[1 0 0 0 107.84 0 100.31 0 0 0 0 100.01]

[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

[0 0 0 0 0 107.84 0 100.31 0 100.01 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]]

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[0 0 0 0 0 0 0 0 0 0 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 53.96]

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inventory = [[295 0 0 0 0]

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[296 0 0 0 0]

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[550.21 254.21 146.37 46.053 0]

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[604.17 308.17 200.33 100.01 0]];

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[0 0 0 0 0 0 0 0 0 10 0 0]

[0 0 5 10 5 0 5 5 5 5 10 0]

[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 10 10 10 10 10 10 10 10 10 0 10]

[0 10 10 0 0 0 10 0 0 0 0 0]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-19:** TAS2C3D1 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_1)

// solution (optimal) with objective 5883.1016

// Quality Incumbent solution:

// MILP objective 5.8831016000e+003

// MILP solution norm |x| (Total, Max) 7.02916e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 7.37543e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

productionquantity = [[[0

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[1 0 0 0 100.01 0 0 100 0 100 0 0]]

[[0 0 0 0 0 0 0 0 0 0 0 0]

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[[0 0 0 0 0 0 0 0 0 0 0 0]

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inventory = [[100 0 0 0 0]

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[201.01 100.01 0 0 0]

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**Test Instance-20:** TAS2C3D2 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_2)

// solution (optimal) with objective 5884.6256

// Quality Incumbent solution:

// MILP objective 5.8846256000e+003

// MILP solution norm |x| (Total, Max) 7.18160e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 1.70530e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 2.84217e-014

//

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**Test Instance-21:** TAS2C3D3 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_3)

// solution (optimal) with objective 5887.9784

// Quality Incumbent solution:

// MILP objective 5.8879784000e+003

// MILP solution norm |x| (Total, Max) 7.51695e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 3.82272e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 1.42109e-014

//

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B\_setuptime = [[0 0 10 10 10 10 0 10 10 10 0 0]

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**Test Instance-22:** TAS2C3D4 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_4)

// solution (optimal) with objective 5883.5236

// Quality Incumbent solution:

// MILP objective 5.8835236000e+003

// MILP solution norm |x| (Total, Max) 7.04233e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.78009e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.70530e-013 2.84217e-014

//

productionquantity = [[[0

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 0 0 0 0 10 0 0 0 10 10 0]

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[10 10 10 10 10 10 10 10 10 10 10 0]];

B\_setuptime = [[0 0 10 10 10 10 0 10 10 10 0 0]

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**Test Instance-23:** TAS2C3D5 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_5)

// solution (optimal) with objective 5891.4

// Quality Incumbent solution:

// MILP objective 5.8914000000e+003

// MILP solution norm |x| (Total, Max) 7.39237e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 7.53175e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 0.00000e+000 0.00000e+000

//

productionquantity = [[[0

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**Test Instance-24:** TAS2C3D6 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_6)

// solution (optimal) with objective 5908.7274

// Quality Incumbent solution:

// MILP objective 5.9087274000e+003

// MILP solution norm |x| (Total, Max) 8.16245e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 7.68807e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 1.42109e-014

//

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**Test Instance-25:** TAS2C3D7 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_7)

// solution (optimal) with objective 5884.709

// Quality Incumbent solution:

// MILP objective 5.8847090000e+003

// MILP solution norm |x| (Total, Max) 7.06171e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 2.84217e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 0.00000e+000 0.00000e+000

//

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**Test Instance-26:** TAS2C3D8 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_8)

// solution (optimal) with objective 5910.3286

// Quality Incumbent solution:

// MILP objective 5.9103286000e+003

// MILP solution norm |x| (Total, Max) 7.70233e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 3.86535e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 2.84217e-014

//

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B\_setuptime = [[0 0 10 10 10 10 0 10 10 10 0 0]

[0 0 10 0 0 0 10 0 0 0 0 10]

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**Test Instance-27:** TAS2C3D9 (Test Assembly Setup-Profile\_2 Capacity-Profile\_3 Demand-Series\_9)

// solution (optimal) with objective 5966.6926

// Quality Incumbent solution:

// MILP objective 5.9666926000e+003

// MILP solution norm |x| (Total, Max) 9.11169e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 2.84217e-013 8.52651e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 2.84217e-014

//

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E\_setuptime = [[10 0 0 0 0 10 0 0 0 10 10 0]

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B\_setuptime = [[0 0 10 10 10 10 0 10 10 10 0 0]

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**Test Instance-28:** TAS2C4D1 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_1)

// solution (optimal) with objective 6176.435

// Quality Incumbent solution:

// MILP objective 6.1764350000e+003

// MILP solution norm |x| (Total, Max) 7.51805e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 8.12728e-012 1.81899e-012

// MILP x bound error (Total, Max) 1.74749e-013 1.70530e-013

// MILP x integrality error (Total, Max) 5.10703e-015 2.44249e-015

// MILP slack bound error (Total, Max) 7.67497e-012 7.27596e-012

//

productionquantity = [[[0

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**Test Instance-29:** TAS2C4D2 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_2)

// solution (optimal) with objective 6177.959

// Quality Incumbent solution:

// MILP objective 6.1779590000e+003

// MILP solution norm |x| (Total, Max) 7.67048e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 4.03944e-012 1.81899e-012

// MILP x bound error (Total, Max) 4.44089e-016 4.44089e-016

// MILP x integrality error (Total, Max) 1.11022e-015 4.44089e-016

// MILP slack bound error (Total, Max) 1.66755e-013 2.84217e-014

//

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**Test Instance-30:** TAS2C4D3 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_3)

// solution (optimal) with objective 6181.3118

// Quality Incumbent solution:

// MILP objective 6.1813118000e+003

// MILP solution norm |x| (Total, Max) 8.00584e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 7.35967e-013 1.63425e-013

// MILP x bound error (Total, Max) 1.60094e-013 1.56319e-013

// MILP x integrality error (Total, Max) 3.88578e-015 1.99840e-015

// MILP slack bound error (Total, Max) 7.69473e-012 3.63798e-012

//

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B\_setuptime = [[0 10 10 10 10 5 0 10 0 10 10 10]

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**Test Instance-31:** TAS2C4D4 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_4)

// solution (optimal) with objective 6176.857

// Quality Incumbent solution:

// MILP objective 6.1768570000e+003

// MILP solution norm |x| (Total, Max) 7.53122e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 7.58549e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.99840e-015 1.11022e-015

// MILP x integrality error (Total, Max) 2.22045e-015 1.11022e-015

// MILP slack bound error (Total, Max) 1.12350e-011 1.09139e-011

//

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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B\_setuptime = [[0 10 10 10 10 5 0 10 0 10 10 10]

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**Test Instance-32:** TAS2C4D5 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_5)

// solution (optimal) with objective 6184.7334

// Quality Incumbent solution:

// MILP objective 6.1847334000e+003

// MILP solution norm |x| (Total, Max) 7.88126e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 7.70017e-012 3.63798e-012

// MILP x bound error (Total, Max) 1.11022e-015 1.11022e-015

// MILP x integrality error (Total, Max) 3.55271e-015 1.11022e-015

// MILP slack bound error (Total, Max) 1.35447e-013 7.10543e-014

//

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**Test Instance-33:** TAS2C4D6 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_6)

// solution (optimal) with objective 6202.0608

// Quality Incumbent solution:

// MILP objective 6.2020608000e+003

// MILP solution norm |x| (Total, Max) 8.65134e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 4.59788e-012 1.81899e-012

// MILP x bound error (Total, Max) 1.58318e-013 1.56319e-013

// MILP x integrality error (Total, Max) 3.10862e-015 1.11022e-015

// MILP slack bound error (Total, Max) 4.13447e-013 1.56319e-013

//

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**Test Instance-34:** TAS2C4D7 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_7)

// solution (optimal) with objective 6178.0424

// Quality Incumbent solution:

// MILP objective 6.1780424000e+003

// MILP solution norm |x| (Total, Max) 7.55060e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 4.11826e-012 1.81899e-012

// MILP x bound error (Total, Max) 6.66134e-016 6.66134e-016

// MILP x integrality error (Total, Max) 1.33227e-015 6.66134e-016

// MILP slack bound error (Total, Max) 7.40830e-012 7.27596e-012

//

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**Test Instance-35:** TAS2C4D8 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_8)

// solution (optimal) with objective 6203.662

// Quality Incumbent solution:

// MILP objective 6.2036620000e+003

// MILP solution norm |x| (Total, Max) 8.19122e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 4.17799e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 2.02505e-013 1.13687e-013

//

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B\_setuptime = [[0 10 10 10 10 5 0 10 0 10 10 10]

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**Test Instance-36:** TAS2C4D9 (Test Assembly Setup-Profile\_2 Capacity-Profile\_4 Demand-Series\_9)

// solution (optimal) with objective 6260.026

// Quality Incumbent solution:

// MILP objective 6.2600260000e+003

// MILP solution norm |x| (Total, Max) 9.60058e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 1.65246e-012 3.85469e-013

// MILP x bound error (Total, Max) 5.73097e-013 3.97904e-013

// MILP x integrality error (Total, Max) 6.21725e-015 2.88658e-015

// MILP slack bound error (Total, Max) 6.98885e-013 3.97904e-013

//

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B\_setuptime = [[0 10 10 10 10 5 0 10 0 10 10 10]

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**Test Instance-37:** TAS2C5D1 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_1)

// solution (optimal) with objective 5883.1016

// Quality Incumbent solution:

// MILP objective 5.8831016000e+003

// MILP solution norm |x| (Total, Max) 7.02916e+003 4.01010e+002

// MILP solution error (Ax=b) (Total, Max) 7.54596e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 1.42109e-014

//

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**Test Instance-38:** TAS2C5D2 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_2)

// solution (optimal) with objective 5884.6256

// Quality Incumbent solution:

// MILP objective 5.8846256000e+003

// MILP solution norm |x| (Total, Max) 7.18160e+003 4.16162e+002

// MILP solution error (Ax=b) (Total, Max) 3.97904e-013 1.13687e-013

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 2.84217e-014

//

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**Test Instance-39:** TAS2C5D3 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_3)

// solution (optimal) with objective 5887.9784

// Quality Incumbent solution:

// MILP objective 5.8879784000e+003

// MILP solution norm |x| (Total, Max) 7.51695e+003 4.49495e+002

// MILP solution error (Ax=b) (Total, Max) 3.72324e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 1.42109e-014

//

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B\_setuptime = [[0 0 10 0 10 10 0 10 0 0 10 0]

[0 0 10 0 0 0 0 0 0 10 0 5]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-40:** TAS2C5D4 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_4)

// solution (optimal) with objective 5883.5236

// Quality Incumbent solution:

// MILP objective 5.8835236000e+003

// MILP solution norm |x| (Total, Max) 7.04233e+003 4.02302e+002

// MILP solution error (Ax=b) (Total, Max) 3.96483e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.70530e-013 2.84217e-014

//

productionquantity = [[[0

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[[0 0 0 0 0 0 0 0 79.999 0 0 100]

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[222.3 120.05 20.002 0 0]

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sb = [[0 0 0 0 0 0 0 0 0 0 0 0]

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stagesetup = [[[0 0 0 0 0 0 0 0 0 0 0 0]

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E\_setuptime = [[10 0 10 0 0 10 0 10 10 0 10 0]

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B\_setuptime = [[0 0 10 0 10 10 0 10 0 0 10 0]

[0 0 10 0 0 0 0 0 0 10 0 5]

[0 0 0 0 0 0 0 0 0 0 0 0]];

**Test Instance-41:** TAS2C5D5 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_5)

// solution (optimal) with objective 5891.4

// Quality Incumbent solution:

// MILP objective 5.8914000000e+003

// MILP solution norm |x| (Total, Max) 7.39237e+003 4.36829e+002

// MILP solution error (Ax=b) (Total, Max) 3.90799e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 0.00000e+000 0.00000e+000

//

productionquantity = [[[0

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**Test Instance-42:** TAS2C5D6 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_6)

// solution (optimal) with objective 5908.7274

// Quality Incumbent solution:

// MILP objective 5.9087274000e+003

// MILP solution norm |x| (Total, Max) 8.16245e+003 5.12788e+002

// MILP solution error (Ax=b) (Total, Max) 7.60281e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 1.42109e-014

//

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**Test Instance-43:** TAS2C5D7 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_7)

// solution (optimal) with objective 5884.709

// Quality Incumbent solution:

// MILP objective 5.8847090000e+003

// MILP solution norm |x| (Total, Max) 7.06171e+003 4.04167e+002

// MILP solution error (Ax=b) (Total, Max) 3.41061e-013 5.68434e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.42109e-013 7.10543e-014

//

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**Test Instance-44:** TAS2C5D8 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_8)

// solution (optimal) with objective 5910.3286

// Quality Incumbent solution:

// MILP objective 5.9103286000e+003

// MILP solution norm |x| (Total, Max) 7.70233e+003 4.66666e+002

// MILP solution error (Ax=b) (Total, Max) 3.85114e-012 3.63798e-012

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 8.52651e-014 2.84217e-014

//

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**Test Instance-45:** TAS2C5D9 (Test Assembly Setup-Profile\_2 Capacity-Profile\_5 Demand-Series\_9)

// solution (optimal) with objective 5966.6926

// Quality Incumbent solution:

// MILP objective 5.9666926000e+003

// MILP solution norm |x| (Total, Max) 9.11169e+003 6.04166e+002

// MILP solution error (Ax=b) (Total, Max) 4.40536e-013 7.10543e-014

// MILP x bound error (Total, Max) 0.00000e+000 0.00000e+000

// MILP x integrality error (Total, Max) 0.00000e+000 0.00000e+000

// MILP slack bound error (Total, Max) 1.13687e-013 2.84217e-014

//

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