

TestScenarioAndResults

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-- =====
-- APPENDIX C - Complete test scenarios of TrayAllocator VDM++ Model
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-- =====
scenario1.txt: - Only 1 tray items
-- =====

mk_(21,[mk_(0,1,100),
        mk_(0,2,200),
        mk_(0,3,300),
        mk_(1,1,400),
        mk_(1,2,500),
        mk_(1,3,100),
        mk_(2,1,200),
        mk_(2,2,300),
        mk_(2,3,400),
        mk_(3,1,500),
        mk_(3,2,100),
        mk_(3,3,200),
        mk_(4,1,300),
        mk_(4,2,400),
        mk_(4,3,500),
        mk_(5,1,100),
        mk_(5,2,200),
        mk_(5,3,300),
        mk_(6,1,100),
        mk_(6,2,200),
        mk_(6,3,300),
        mk_(7,1,100),
        mk_(7,2,200),
        mk_(7,3,300)])

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Tray allocation model test #1 : scenario1.txt
-----

Card reader tray id 1
Card reader tray id 2
*Induction id 1
-> Item id 1 size 100 on tray id 5
*Induction id 2
-> Item id 2 size 200 on tray id 7
*Induction id 3
-> Item id 3 size 300 on tray id 9
Card reader tray id 3
Card reader tray id 4
Card reader tray id 5
*Induction id 1
-> Item id 4 size 400 on tray id 8
*Induction id 2
-> Item id 5 size 500 on tray id 10
*Induction id 3
-> Item id 6 size 100 on tray id 12
Card reader tray id 6
Card reader tray id 7
Card reader tray id 8
*Induction id 1
-> Item id 7 size 200 on tray id 11
*Induction id 2
-> Item id 8 size 300 on tray id 13
*Induction id 3
-> Item id 9 size 400 on tray id 15
Card reader tray id 9
Card reader tray id 10
```

TestScenarioAndResults

```

Card reader tray id 11
*Induction id 1
-> Item id 10 size 500 on tray id 14
*Induction id 2
-> Item id 11 size 100 on tray id 16
*Induction id 3
-> Item id 12 size 200 on tray id 18
Card reader tray id 12
Card reader tray id 13
Card reader tray id 14
*Induction id 1
-> Item id 13 size 300 on tray id 17
*Induction id 2
-> Item id 14 size 400 on tray id 19
*Induction id 3
-> Item id 15 size 500 on tray id 1
Card reader tray id 15
Card reader tray id 16
Card reader tray id 17
*Induction id 1
-> Item id 16 size 100 on tray id 20
*Induction id 2
-> Item id 17 size 200 on tray id 2
*Induction id 3
-> Item id 18 size 300 on tray id 4
Card reader tray id 18
Card reader tray id 19
Card reader tray id 20
*Induction id 1
-> Item id 19 size 100 on tray id 3
Card reader tray id 1
*Induction id 2
-> Item id 20 size 200 on tray id 6
Card reader tray id 2

```

Simulation completed for sorter configuration

```

Specified throughput [items/hour]: 10000
Sorter speed          [mm/sec]: 2000
Item max size         [mm]: 1500
Item min size         [mm]: 100
Tray size              [mm]: 600
Number of trays                : 20
Number of inductions           : 3
Induction rate                 : 2
Induction separation [trays]: 2

```

```

-----
Number of trays with items      : 20
Two tray items on sorter       : 0
Number of tray steps           : 22
Number of inducted items       : 20
Calculated throughput[items/hour]: 10909

```

**** Sorter is full *****

-- =====
scenario2.txt: Only 2 tray items
-- =====

```

mk_(21,[mk_(0,1,600),
          mk_(0,2,700),
          mk_(0,3,800),
          mk_(2,1,900),

```

TestScenarioAndResults

```
mk_(2,2,600),  
mk_(2,3,700),  
mk_(4,1,700),  
mk_(4,2,800),  
mk_(4,3,900),  
mk_(6,1,600),  
mk_(6,2,700),  
mk_(6,3,800),  
mk_(8,1,900),  
mk_(8,2,600),  
mk_(8,3,700),  
mk_(10,1,800),  
mk_(10,2,900),  
mk_(10,3,600)])
```

Tray allocation model test #2 : scenario2.txt

```
Card reader tray id 1  
Card reader tray id 2  
*Induction id 1  
-> Item id 1 size 600 on tray id 5  
-> Item id 1 size 600 on tray id 4  
*Induction id 2  
-> Item id 2 size 700 on tray id 7  
-> Item id 2 size 700 on tray id 6  
*Induction id 3  
-> Item id 3 size 800 on tray id 9  
-> Item id 3 size 800 on tray id 8  
Card reader tray id 3  
Card reader tray id 4  
Card reader tray id 5  
Card reader tray id 6  
Card reader tray id 7  
Card reader tray id 8  
*Induction id 1  
-> Item id 4 size 900 on tray id 11  
-> Item id 4 size 900 on tray id 10  
*Induction id 2  
-> Item id 5 size 600 on tray id 13  
-> Item id 5 size 600 on tray id 12  
*Induction id 3  
-> Item id 6 size 700 on tray id 15  
-> Item id 6 size 700 on tray id 14  
Card reader tray id 9  
Card reader tray id 10  
Card reader tray id 11  
Card reader tray id 12  
Card reader tray id 13  
Card reader tray id 14  
*Induction id 1  
-> Item id 7 size 700 on tray id 17  
-> Item id 7 size 700 on tray id 16  
*Induction id 2  
-> Item id 8 size 800 on tray id 19  
-> Item id 8 size 800 on tray id 18  
*Induction id 3  
-> Item id 9 size 900 on tray id 1  
-> Item id 9 size 900 on tray id 20  
Card reader tray id 15  
Card reader tray id 16  
Card reader tray id 17  
Card reader tray id 18  
Card reader tray id 19
```

TestScenarioAndResults

Card reader tray id 20

*Induction id 1

-> Item id 10 size 600 on tray id 3

-> Item id 10 size 600 on tray id 2

Card reader tray id 1

Card reader tray id 2

Simulation completed for sorter configuration

Specified throughput [items/hour]: 10000

Sorter speed [mm/sec]: 2000

Item max size [mm]: 1500

Item min size [mm]: 100

Tray size [mm]: 600

Number of trays : 20

Number of inductions : 3

Induction rate : 2

Induction separation [trays]: 2

Number of trays with items : 20

Two tray items on sorter : 20

Number of tray steps : 22

Number of inducted items : 10

Calculated throughput[items/hour]: 10909

**** Sorter is full ****

-- =====
scenario3.txt: Mix 1 of one and two tray items
-- =====

```
mk_(21,[mk_(0,1,100),  
        mk_(0,2,800),  
        mk_(0,3,200),  
        mk_(2,1,200),  
        mk_(2,2,400),  
        mk_(2,3,700),  
        mk_(4,1,800),  
        mk_(4,2,300),  
        mk_(4,3,400),  
        mk_(5,1,900),  
        mk_(5,2,800),  
        mk_(5,3,200),  
        mk_(6,1,600),  
        mk_(6,2,400),  
        mk_(6,3,300),  
        mk_(8,1,900),  
        mk_(8,2,300),  
        mk_(8,3,200),  
        mk_(10,1,500),  
        mk_(10,2,300),  
        mk_(10,3,200)])
```

Tray allocation model test #3 : scenario3.txt

Card reader tray id 1

Card reader tray id 2

*Induction id 1

-> Item id 1 size 100 on tray id 5

*Induction id 2

-> Item id 2 size 800 on tray id 7

-> Item id 2 size 800 on tray id 6

TestScenarioAndResults

```
*Induction id 3
-> Item id 3 size 200 on tray id 9
Card reader tray id 3
Card reader tray id 4
Card reader tray id 5
*Induction id 1
-> Item id 4 size 200 on tray id 8
*Induction id 2
-> Item id 5 size 400 on tray id 10
*Induction id 3
-> Item id 6 size 700 on tray id 12
-> Item id 6 size 700 on tray id 11
Card reader tray id 6
Card reader tray id 7
Card reader tray id 8
Card reader tray id 9
Card reader tray id 10
Card reader tray id 11
*Induction id 1
-> Item id 7 size 800 on tray id 14
-> Item id 7 size 800 on tray id 13
*Induction id 2
-> Item id 8 size 300 on tray id 16
*Induction id 3
-> Item id 9 size 400 on tray id 18
Card reader tray id 12
Card reader tray id 13
Card reader tray id 14
Card reader tray id 15
Card reader tray id 16
Card reader tray id 17
*Induction id 1
-> Item id 10 size 900 on tray id 20
-> Item id 10 size 900 on tray id 19
*Induction id 2
-> Item id 11 size 800 on tray id 2
-> Item id 11 size 800 on tray id 1
*Induction id 3
-> Item id 12 size 200 on tray id 4
Card reader tray id 18
Card reader tray id 19
Card reader tray id 20
Card reader tray id 1
Card reader tray id 2
-----
Simulation completed for sorter configuration
-----
Specified throughput [items/hour]: 10000
Sorter speed          [mm/sec]: 2000
Item max size         [mm]: 1500
Item min size         [mm]: 100
Tray size             [mm]: 600
Number of trays              : 20
Number of inductions         : 3
Induction rate               : 2
Induction separation         [trays]: 2
-----
Number of trays with items      : 17
Two tray items on sorter       : 10
Number of tray steps           : 22
Number of inducted items       : 12
Calculated throughput[items/hour]: 9272
-----
****  Sorter is not full  ****
```

TestScenarioAndResults

```
-----  
-- =====  
scenario4.txt: Mix 2 of one and two tray items  
-- =====  
  
mk_(21,[mk_(0,1,700),  
        mk_(0,2,400),  
        mk_(0,3,200),  
        mk_(2,1,700),  
        mk_(2,2,400),  
        mk_(2,3,100),  
        mk_(4,1,900),  
        mk_(4,2,300),  
        mk_(4,3,400),  
        mk_(6,1,700),  
        mk_(6,2,400),  
        mk_(6,3,300),  
        mk_(8,1,700),  
        mk_(8,2,300),  
        mk_(8,3,200),  
        mk_(9,1,700),  
        mk_(9,2,300),  
        mk_(9,3,200),  
        mk_(10,1,800),  
        mk_(10,2,300),  
        mk_(10,3,200)])  
  
-----  
Tray allocation model test #4 : scenario4.txt  
-----  
Card reader tray id 1  
Card reader tray id 2  
*Induction id 1  
-> Item id 1 size 700 on tray id 5  
-> Item id 1 size 700 on tray id 4  
*Induction id 2  
-> Item id 2 size 400 on tray id 7  
*Induction id 3  
-> Item id 3 size 200 on tray id 9  
Card reader tray id 3  
Card reader tray id 4  
Card reader tray id 5  
Card reader tray id 6  
Card reader tray id 7  
Card reader tray id 8  
*Induction id 1  
-> Item id 4 size 700 on tray id 11  
-> Item id 4 size 700 on tray id 10  
*Induction id 2  
-> Item id 5 size 400 on tray id 13  
*Induction id 3  
-> Item id 6 size 100 on tray id 15  
Card reader tray id 9  
Card reader tray id 10  
Card reader tray id 11  
Card reader tray id 12  
Card reader tray id 13  
Card reader tray id 14  
*Induction id 1  
-> Item id 7 size 900 on tray id 17  
-> Item id 7 size 900 on tray id 16  
*Induction id 2  
-> Item id 8 size 300 on tray id 19
```

TestScenarioAndResults

```

*Induction id 3
-> Item id 9 size 400 on tray id 1
Card reader tray id 15
Card reader tray id 16
Card reader tray id 17
Card reader tray id 18
Card reader tray id 19
Card reader tray id 20
*Induction id 1
-> Item id 10 size 700 on tray id 3
-> Item id 10 size 700 on tray id 2
Card reader tray id 1
*Induction id 2
-> Item id 11 size 400 on tray id 6
*Induction id 3
-> Item id 12 size 300 on tray id 8
Card reader tray id 2

```

```

-----
Simulation completed for sorter configuration
-----

```

```

Specified throughput [items/hour]: 10000
Sorter speed          [mm/sec]: 2000
Item max size         [mm]: 1500
Item min size         [mm]: 100
Tray size             [mm]: 600
Number of trays              : 20
Number of inductions         : 3
Induction rate               : 2
Induction separation         [trays]: 2

```

```

-----
Number of trays with items      : 16
Two tray items on sorter       : 8
Number of tray steps           : 22
Number of inducted items       : 12
Calculated throughput[items/hour]: 8727
-----

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```

****   Sorter is not full   ****
-----

```

```

-- =====
scenario5.txt: Mix 3 of one and two tray items
-- =====

```

```

mk_(21,[mk_(0,1,100),
          mk_(1,2,200),
          mk_(1,3,900),
          mk_(3,1,200),
          mk_(3,2,600),
          mk_(4,3,700),
          mk_(4,1,800),
          mk_(5,2,300),
          mk_(5,3,600),
          mk_(5,1,600),
          mk_(6,2,800),
          mk_(6,3,300),
          mk_(6,1,900),
          mk_(8,2,300),
          mk_(8,3,800),
          mk_(9,1,300),
          mk_(9,2,800),
          mk_(10,1,500),
          mk_(10,2,600),
          mk_(10,3,200)])

```

TestScenarioAndResults

Tray allocation model test #5 : scenario5.txt

Card reader tray id 1
Card reader tray id 2
*Induction id 1
-> Item id 1 size 100 on tray id 5
*Induction id 2
-> Item id 2 size 200 on tray id 7
*Induction id 3
-> Item id 3 size 900 on tray id 9
-> Item id 3 size 900 on tray id 8
Card reader tray id 3
Card reader tray id 4
Card reader tray id 5
Card reader tray id 6
Card reader tray id 7
*Induction id 1
-> Item id 4 size 200 on tray id 10
*Induction id 2
-> Item id 5 size 600 on tray id 12
-> Item id 5 size 600 on tray id 11
*Induction id 3
-> Item id 7 size 700 on tray id 14
-> Item id 7 size 700 on tray id 13
Card reader tray id 8
Card reader tray id 9
Card reader tray id 10
Card reader tray id 11
Card reader tray id 12
Card reader tray id 13
*Induction id 1
-> Item id 6 size 800 on tray id 16
-> Item id 6 size 800 on tray id 15
*Induction id 2
-> Item id 9 size 300 on tray id 18
*Induction id 3
-> Item id 10 size 600 on tray id 20
-> Item id 10 size 600 on tray id 19
Card reader tray id 14
Card reader tray id 15
Card reader tray id 16
Card reader tray id 17
Card reader tray id 18
Card reader tray id 19
*Induction id 1
-> Item id 8 size 600 on tray id 2
-> Item id 8 size 600 on tray id 1
*Induction id 2
-> Item id 12 size 800 on tray id 4
-> Item id 12 size 800 on tray id 3
*Induction id 3
-> Item id 13 size 300 on tray id 6
Card reader tray id 20
Card reader tray id 1
Card reader tray id 2

Simulation completed for sorter configuration

Specified throughput [items/hour]: 10000
Sorter speed [mm/sec]: 2000
Item max size [mm]: 1500
Item min size [mm]: 100
Tray size [mm]: 600

TestScenarioAndResults

```
Number of trays           : 20
Number of inductions      : 3
Induction rate            : 2
Induction separation      [trays]: 2
-----
Number of trays with items : 19
Two tray items on sorter  : 14
Number of tray steps      : 22
Number of inducted items  : 12
Calculated throughput[items/hour]: 10363
-----
****  Sorter is not full  ****
-----
```