

Report Multi-agent Systems Module III

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1 First Assignment

1.1 Earliest & latest starting time

The first question focusses on using the `FastFloyd` algorithm to determine the earliest and latest starting times of the events specified. An implementation can be found in the `ex1.m` source file together with the `LoadMatrix` function.

1.2 Constraints

To add arbitrary STN-constraints the `newSTN` function is defined. It receives a constraint in the parameters and verifies that the constraint can be added without creating inconsistency. If so, the constraint is set in the matrix and the `FastFloyd` algorithm is applied again. To allow more efficient processing later on a matrix of constraints can also be entered that are checked in their entirety. An example testing the implementation can be found as `ex2.m`, that shows inconsistent and consistent constraints added to `stn5` and `snt49`.

1.3 Iterative schedule construction

To allow the construction of arbitrary schedules, an STN is loaded and the user is prompted for input. This is done in `ex3.m`. If the value entered isn't inside the allowed interval it is refused, and otherwise added to the resulting matrix and the `FastFloyd` algorithm is run to ensure the STN is updated. Appendix A.1 shows a trace for the problem `stn49.tab`

1.4 Schedule monitoring

For this question, a schedule is being checked as input step by step. As soon as a constraint is violated, the process stops and determines that the current input is invalid. Otherwise, the schedule is accepted as valid. `ex4.m` provides an implementation with a correct and incorrect size 145 input exported in table form, that are equal except for a value of 0 on a_{42} .

2 Second Assignment

B

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A Examples and Traces

A.1 Trace for matrix size 49 (Question 1.3)

Choose a value for variable 41 in the range of -627 and 791?	658
Choose a value for variable 7 in the range of -599 and 1065?	921
Choose a value for variable 32 in the range of 392 and 1787?	528
Choose a value for variable 15 in the range of -782 and 1049?	219
Choose a value for variable 48 in the range of 240 and 1380?	1340
Choose a value for variable 9 in the range of -1422 and -315?	-347
Choose a value for variable 47 in the range of -1355 and -255?	-821
Choose a value for variable 38 in the range of -1285 and -1149?	-1266
Choose a value for variable 21 in the range of -209 and 127?	99
Choose a value for variable 37 in the range of -366 and 681?	639
Choose a value for variable 30 in the range of -979 and 459?	-928
Choose a value for variable 42 in the range of -1036 and -224?	-277
Choose a value for variable 31 in the range of 594 and 1109?	984
Choose a value for variable 35 in the range of 356 and 1113?	653
Choose a value for variable 28 in the range of 602 and 1602?	773
Choose a value for variable 33 in the range of -475 and -422?	-474
Choose a value for variable 12 in the range of -690 and -650?	-689
Choose a value for variable 5 in the range of 433 and 1149?	1023
Choose a value for variable 29 in the range of 235 and 263?	244
Choose a value for variable 46 in the range of 101 and 227?	105
Choose a value for variable 19 in the range of -259 and 364?	-21
Choose a value for variable 36 in the range of -188 and 634?	466
Choose a value for variable 8 in the range of 676 and 798?	736
Choose a value for variable 20 in the range of -1330 and -579?	-844
Choose a value for variable 34 in the range of 724 and 1034?	958
Choose a value for variable 13 in the range of -992 and -69?	-364
Choose a value for variable 26 in the range of 322 and 323?	322
Choose a value for variable 4 in the range of 300 and 332?	316
Choose a value for variable 49 in the range of -955 and 733?	-381
Choose a value for variable 24 in the range of 290 and 466?	329
Choose a value for variable 39 in the range of 1009 and 1086?	1028
Choose a value for variable 18 in the range of -814 and -670?	-713
Choose a value for variable 44 in the range of 597 and 1020?	1003
Choose a value for variable 22 in the range of -753 and -388?	-703
Choose a value for variable 6 in the range of 439 and 1223?	641
Choose a value for variable 40 in the range of -290 and -232?	-275
Choose a value for variable 27 in the range of -795 and -485?	-720
Choose a value for variable 45 in the range of -891 and -874?	-885
Choose a value for variable 3 in the range of 141 and 201?	156
Choose a value for variable 17 in the range of -962 and -923?	-944
Choose a value for variable 11 in the range of 147 and 153?	152
Choose a value for variable 23 in the range of -1059 and -408?	-701
Choose a value for variable 43 in the range of -339 and -338?	-339
Choose a value for variable 16 in the range of -895 and -232?	-395
Choose a value for variable 10 in the range of -1644 and -883?	-1212
Choose a value for variable 2 in the range of 224 and 1223?	277
Choose a value for variable 25 in the range of -400 and -212?	-253
Choose a value for variable 14 in the range of -1600 and -964?	-1518
The chosen values are: 0 277 156 316 1023 641 921 736 -347 -1212 152 -689 -364	

-1518 219 -395 -944 -713 -21 -844 99 -703 -701 329 -253 322 -720 773 244 -928 984 528
-474 958 653 466 639 -1266 1028 -275 658 -277 -339 1003 -885 105 -821 1340 -381