| Name: |

Model-based Decision Support

Exam 6 (home assignment)   Till May 17, 2018
                                  Grace period till: May 24, 2018

Especially for those interested in Advanced Planning and Scheduling (I expect all of you ;-)) I have prepared a special home assignment. The goal of this home assignment is to get some practical experience in sequencing and scheduling. GAMS acts as a mediator; I intend limiting GAMS programming to a necessary minimum. At TISS I provide you the GAMS code "FMS_AutonomousProductionPlan.gms", where at the moment two jobs have to be scheduled on 3 stations (excluding input and output stations).

Design a scheduling problem with up to 5 jobs and four to six stations (if you include input and output stations, there will be six to eight stations). Provide this scheduling problem to the GAMS Code; u'll find a description how at the beginning of the GAMS code. Additionally, please add one job with the given individualized sequence of operations:

> For X use the last digit of your student enrolment number, Y the last but one digit, and Z the last but two. The sequence of stations for this individualized job is:
>
> * Input -> O2 = X (modulo 3) + 2
>   -> O3 = MAX $\{$ (O2 + 1 + Y(modulo 2)) (modulo 5) ; 1 $\}$
>   -> O4 = O2 – 1 -> Output
>
> * And if Z is even, then mirror the sequence to Input -> O4->O3->O2->Output.
> * Add one to O2, O3, and O4. (then we can fix Number 1 to the Input Station)
>
> Example ….397: Input –> 4 -> 2 -> 3 -> Output
>   ….497: Input -> 3 -> 2 -> 4 -> Output

After computation, the information for the optimal schedule u'll find in the continuous variable family t; t(operxy) is the time when the AGV loads job x from the output buffer at machine (station) mu(y). IB(operxy), OB(operxy), tm(operxy) store the time job x staying in the input buffer, output buffer and processing at machine mu(y). The job x enters the FMS system at t(operx1) and exits it at t(operxUnloadstation).

Document your scheduling problem and the optimal schedule.[1] [2] If it was not possible to compute a solution, would you please document your chosen scheduling problem and describe the problems occurred so that I would be in a position to approve your work and to improve the assignment.

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[1] If you went the extra mile and provided an illustration of the solution, it would be fine but it would not be necessary.
[2] Please, don't deliver mere GAMS listing prints