SSO
Simulation and optimization assignment 2

Submit 1 pdf with explanatory text and screenshots of all code and solver calls

Assignment 2.1

a) Implement the single-machine scheduling problem that minimizes total tardiness in AMPL

b) Solve it for the following data with an appropriate solver on the NEOS server

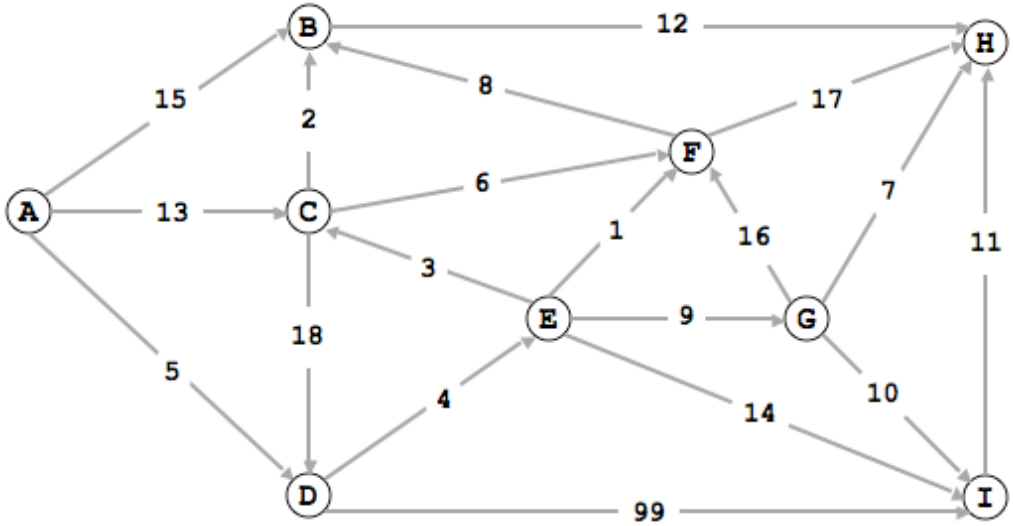
duration	**4**	**5**	**3**	**5**	**7**	**1**	**0**	**3**	**2**	**10**
release time	3	4	7	11	10	0	0	10	0	15
due date	11	12	20	25	20	10	30	30	10	20

c) Request educational license of AIMMS, install it at UvA network, study a tutorial and implement and solve the machine scheduling problem

Grading: a=4, b=4, c=2

Assignment 2.2

a) Use Dijkstra to find the shortest path from A to H in the following graph:



b) Implement the LO formulation in AMPL and use the NEOS server to find the same answer

grading: a=8, b=2

Assignment 2.3

a) Implement the newsvendor problem in Excel and find the optimal order size by hand

b) Turn the problem in a linear one and use the solver to find the optimal solution

Hint: replace the minimization by inequalities by adding a new variable representing sales

c) Use simulation to find (almost) the same answer

d) Determine the confidence interval belonging to the experiment and relate this to the outcome of b)

Grading: a=3, b=2, c=3, d=2

Assignment 2.4

- The standard size of a brick is 210x100x50 mm
- A brick factory makes bricks of this size but with small production errors: the edges are independent and normally distributed with the right expectation and standard deviation 1 mm

a) What is the fraction of bricks with a volume that deviates more than 5% from the expected volume? Use simulation in Excel to answer this question

Hint: Use norminv(rand(),mean,st_dev) to simulate from a normal distribution

b) How accurate is the outcome? Motivate your answer!

Grading: a=8, b=2