

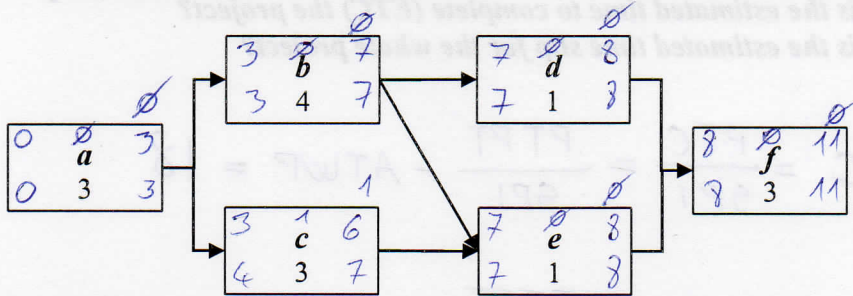
SAMPLE EXERCISES

(for more sample exercises check the sample exam, the slides and the crashing1 file at http://oktato.econ.unideb.hu/kunandras/BAINMBA/PM_BA.htm)

Gantt charts

There are two workers XX and YY. They are identical (both of them can do every task with the same efficiency).

There is the AoN diagram of the project (durations and relations are given only):



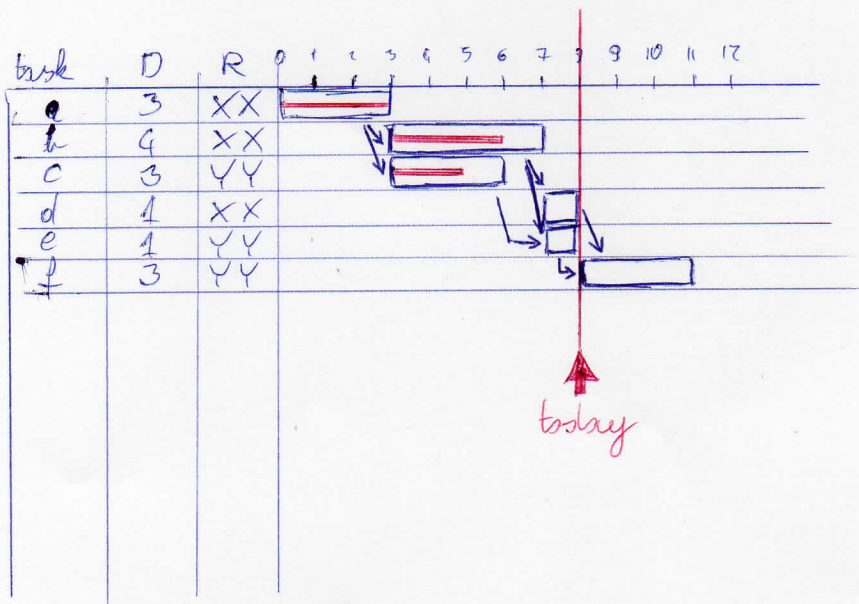
a) Plot a Gantt chart and calculate the shortest possible TPT for a project with the above data. Place everything to its earliest starting time (EST).

b) Mark the dependency relations. Marked with arrows.

c) Create a tracking Gantt chart for the above project if after 8 days we have the following progress information:

a is 100%, b is 75%, c is 66%

Marked with completion lines (red) + 'today' line



TPT = 11 days

At activity, 'd' and 'f' it is unimportant which person we select.

Time control

Planned total project time (PTPT) of 15 days.

After 9 days they had to finish 3 activities completely. From the actual data 'a' (planned duration: 4) is 50%, 'b' is ready (planned duration: 2), 'c' (planned duration: 3) is 33%.

Activities are linearly related.

- a) What is the planned time to complete (PTC) the project? $PTC = PTPT - PTWP = 15 - 5 = 5$
b) Calculate the schedule performance index (SPI). $SPI = \frac{PTWP}{ATWP} = \frac{5}{9} = 55.55\%$
c) What is the estimated time to complete (ETC) the project?
d) What is the estimated time slip for the whole project?

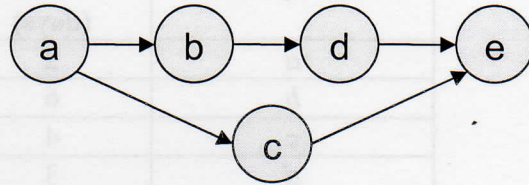
$$c/ ETC = \frac{PTC}{SPI} = \frac{PTPT}{SPI} - ATWP = 18$$

$$d/ slip = PTPT - \frac{PTPT}{SPI} = -12 \text{ days}$$

Cost control

There is a project with the following planned data:

Activity label	Duration (day)	Daily cost of the activity
a	2	10
b	1	20
c	4	20
d	3	30
e	2	10



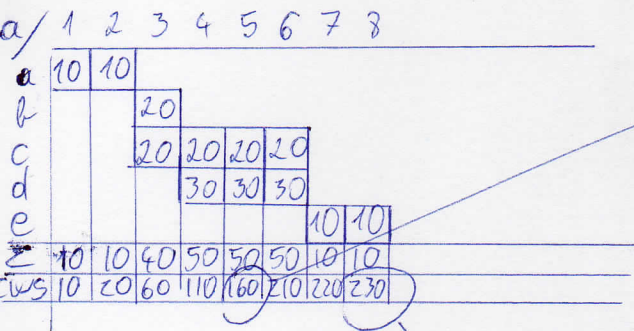
a) Calculate the BCWS data for the whole project (activities placed to their ESTs)!

After 5 days, the monitoring system provides the following information:

- Activity 'a' is completed
- Activity 'b' is completed
- Activity 'c' is 50% completed
- Activity 'd' and 'e' are 0% completed (not even started)
- Money spent: 100

b) Calculate BCWS, BCWP and ACWP for the first 5 days

c) Calculate CPI, SPI, BCC, ECC and FCC



BAC = 230

b/ BCWS for 5 days = 160
 ACWP for 5 days = 100

BCWP for 5 days = 80
 = 10 + 10 + 20 + 20 + 20 = 80
 (a) 100% (b) 100% (c) 50%

c/ $CPI = \frac{BCWP}{ACWP} = \frac{80}{100} = 80\%$

$SPI = \frac{BCWP}{BCWS} = \frac{80}{160} = 50\%$

$BCC = BAC - BCWP = 150$

$ECC = \frac{BCC}{CPI} = 187.5$

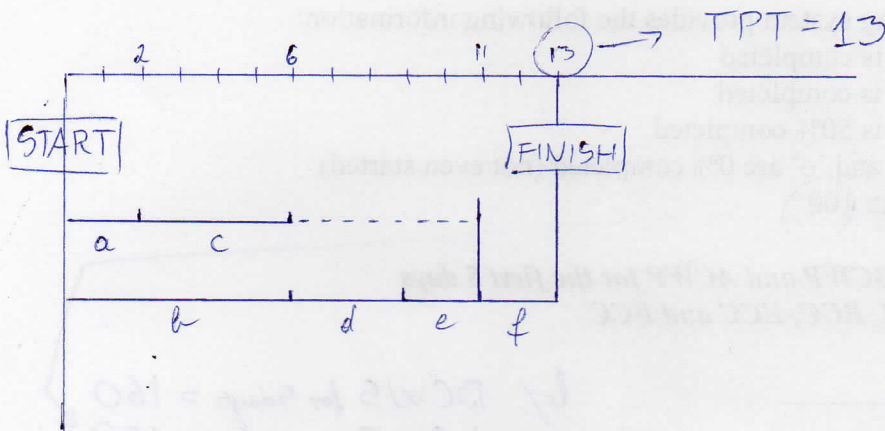
$FCC = \frac{BAC}{CPI} = ACWP + ECC = 287.5$

Time-scaled network – AoN type

The project manager has the following data:

Activity label	Duration (days)	Immediate predecessor
a	2	-
b	6	-
c	4	a
d	3	b
e	2	d
f	2	c, e

- a) Plot an AoN type time scaled network for the project with all the necessary data.
- b) Compute the TPT



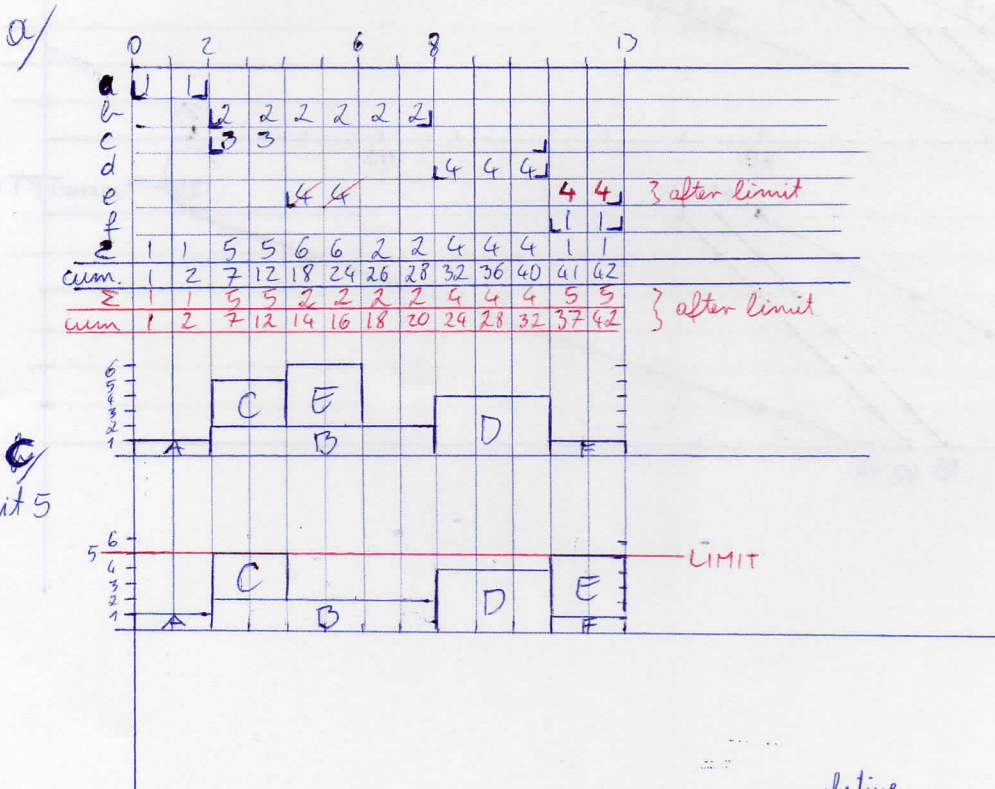
Resource leveling

a) Create a loading chart (with histogram) for the following project, using the ESTs for placing every activity.

Activity label	Duration (days)	Resource use per day	Immediate predecessor
a	2	1	-
b	6	2	a
c	2	3	a
d	3	4	b
e	2	4	c
f	2	1	d

- b) Plot a loading bar chart with a histogram.
- c) Plot an S curve for the project
- d) Modify the loading chart if there is a resource limit at 5.

histogram at the bottom + modifications with red



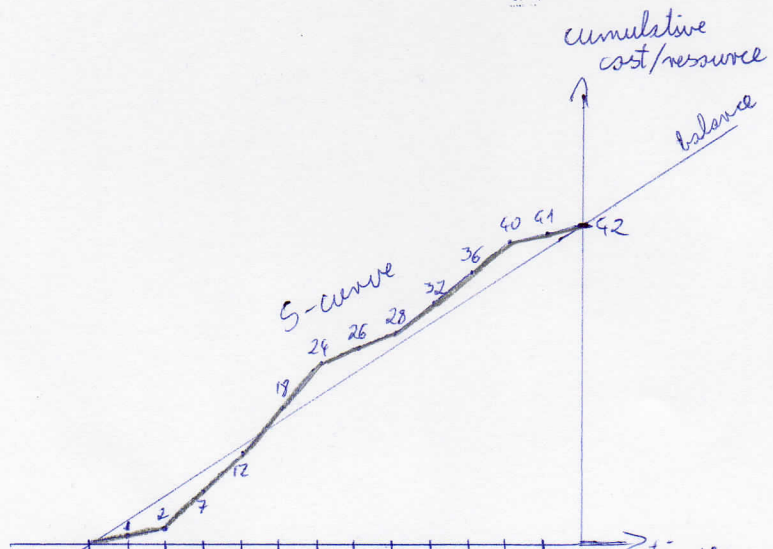
without limit

with limit 5

} after limit

LIMIT

b/



Line-of-balance

There is a project of planting 6 identical trees in a botanical garden.
 Planting a tree requires 4 steps of work (each done by a different person):

- digging: 10 mins
- prepare the hole for the tree with special nutrients: 5 mins
- placing the tree into the hole: 5 mins
- tidy up the surroundings of the tree: 15 mins

a) Plot a LoB chart. Follower worker can start working on a given unit of work immediately after the predecessor team finished. Calculate the TPT.

b) Redesign the LoB chart to eliminate idle time of teams increasing the TPT with only the possible minimum.

