Exercises on project estimation
Situation

- We aim at estimating the resources needed for developing the following project
- $S = 60,000$ NCSS (medium size)
- Some requirements are rigid
- The software can be developed in any programming language
- A similar (but not the same) project has been developed
- The software will be exploited by Web interface
- The software needs a small but reliable database
Exercise 1

- Estimate the needed effort by applying the basic and the intermediate CoCoMo models
  - Cost in person-months
  - Delivery time
  - Cost in Euros
Exercise 2

- Starting from the previous results, apply the Putnam model to estimate the delivery time given an E factor of 20.

- How does the K vary if we schedule a delivery time of 0.5, 1, and 1.5 years?
Exercise 3

- Given the following scheduling for the project activities in weeks, build the PERT diagram and apply the CPM to:
  - Calculate the project duration
  - Identify the critical activities
  - Calculate $t_{\text{min}}$, $t_{\text{max}}$ for each node
  - Calculate the slack of each non critical activity

- What happens if the G activity is delayed of 1 week (total duration 10 weeks)?
### Exercise 3 - scheduling

<table>
<thead>
<tr>
<th>Activity</th>
<th>Precedence</th>
<th>to</th>
<th>tm</th>
<th>tp</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>B</td>
<td></td>
<td>4</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>C</td>
<td>A</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>B,C</td>
<td>3</td>
<td>5</td>
<td>7</td>
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<tr>
<td>E</td>
<td>D</td>
<td>3</td>
<td>3</td>
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<td>F</td>
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<tr>
<td>G</td>
<td>B,C</td>
<td>4</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>H</td>
<td>F,G</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>
Exercise 4

- Given the following activities, define the precedence, estimate the duration for each activity, then build the PERT diagram and apply the CPM to:
  - Calculate the project duration
  - Identify the critical activities
  - Calculate $t_{\text{min}}$, $t_{\text{max}}$ for each node
  - Calculate the slack of each non-critical activity
Exercise 4 - activities

Organize a conference with 4 speakers

A. Decide the content in collaboration with the city administration
B. Define the 4 speakers
C. Decide the date with the speakers
D. Reserve the room
E. Print the flyers
F. Order the desk and the chairs for the room
G. Distribute the flyers
H. Print the posters for the room
I. Arrange the room with desk, chairs, posters