Exercise 1
Scheduling

Distribution: **22.11.2004**
Deadline: **01.12.2004**
Presentation: **06.12.2004**

Total points possible: 20

The homework should be done in pairs of two.

It is recommended to solve the problems by hand and on paper, without the support of project management software.

The solution can be dropped into the mailbox next to the entrance to the J-Floor hallway.
Do not forget to put your names and email addresses on your solution!
The box will be open from 29.11.2004 until the evening of 01.12.2004.

It can also be sent to:

```
ipe@inf.ethz.ch
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as a PDF document.

Name: _____

Student-ID: _____

Email: _____

Name: _____

Student-ID: _____

Email: _____

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Problem Description

Our customer is the hotel chain $_DM^DHotels$ that operates in all Swiss cantons.
The chain consists of 40 hotels with sizes between 20 and 300 beds. The complete chain manages a total of 8000 beds all over Switzerland.
For administration work each hotel has between one and six office workers. In total there are 120 office workers.
The hotels operate very independently and without IT support.
Especially there is no computer usage and no network between the different hotels or within the different offices of one hotel.

The executive directors of $_DM^DHotels$ decided to adopt a modern IT infrastructure, including office workstations, network connections in the hotels, secure dial-up connections between the different hotels and a customized suite of software for the payroll, contracts, customer management, etc.
In the office of the first hotel of the chain there is a powerful main host to support demanding jobs.

Besides the standard deliverables for a project like this, consider the following deliverables:

1. Requirements of hotel hardware
2. Requirements of hotel software
3. Prototype
4. Procedures Documentation
5. Deployment procedures and checklists
6. Help desk material
7. Training material
8. Test cases for user acceptance tests

These can be grouped into the following subprojects:

1. Software
2. Hardware
3. Training and Support
4. Deployment at the Hotels

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Your Tasks

1. **Scope Definition:** Create a Work Breakdown Structure WBS. *(3 points)*
   Based on the deliverables the subprojects can be refined into tasks.
   Put the subprojects and tasks into a WBS with at least 20 elements (including the subprojects and the project).
   It should be possible to estimate the effort of each task.

2. **Activity Definition:** Refine the structure to the level of activities. *(2 points)*
   Each task should have at least two activities.
   Remember that each activity should have an effort between 40 and 80 person hours.

3. **Effort Estimation:** Estimate the effort required for each activity and task in hours. *(2 points)*
   Assume reasonable values for everything that is not specified in more detail.

4. **Activity Sequencing:** Create a network diagram. *(3 points)*
   The network diagram shows the dependencies between the different activities.

5. **Activity Duration Estimation:** Calculate the duration for each activity. *(2 points)*
   Assume a productivity of 75% and an availability of 80%.

6. **Schedule Analysis:** Calculate the forward and backward pass. *(2 points)*
   Determine the early start and early finish dates in the forward pass.
   Determine the late start and late finish dates in the backward pass.
   The dates are relative to a start date.

7. **Schedule Development:** For the "Training and Support" subproject relate the activities to calendar dates. *(2 points)*
   As project starting date use 03.01.2005.
   Do not consider vacations.

8. **Critical Path:** Find the critical path for the project. *(2 points)*
   For each activity determine the float.
   Find the path(s) with zero float.

9. **Schedule compression:** Change the project plan in such a way that the "Training and Support" subproject finishes 4 weeks earlier. As technique use:
   a. Crashing *(1 point)*
   b. Fast Tracking *(1 point)*