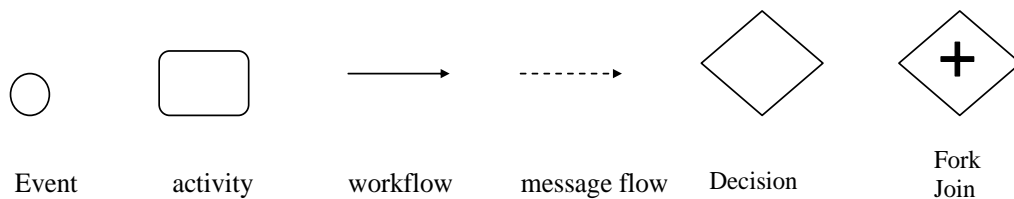


## Homework 2

Sungwon Kang

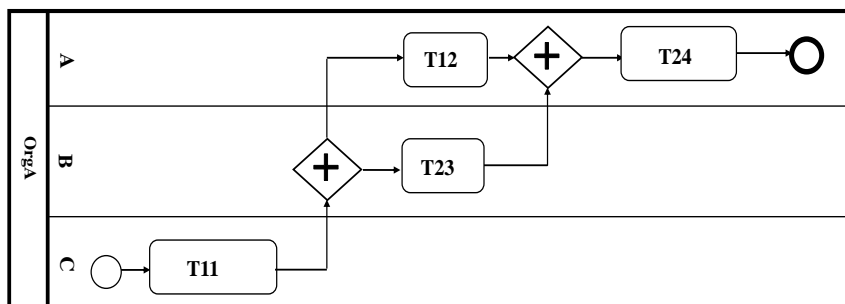
Due April 11, 2016

1. (30 pts) BPMN<sup>1</sup> is a business process modeling notation. Although the full set of BPMN notation is large, there are only six basic constructs:



A process starts with a *start event* and ends with an event called *stop event*. A workflow indicates the sequence in which activities are performed and a message flow between activities indicates that an activity performed by an actor sends a message to another activity performed by a different actor. Decision indicates a decision point and Fork-Join is used to indicate creation of (multiple) concurrent flows.

**Example)** The following depicts a process of an organization OrgA. In OrgA, there are three actors (i.e. participants), A, B and C. In the OrgA's process, once the process starts, C perform activity T11, then A and B concurrently executes activities T12 and T23, respectively and after that finally A executes T24 and the whole process ends.



- (a) (15 pts) Design a process for shopping. Suppose that your project team consisting of 3 members goes shopping. Describe the process with the BPMN basic constructs.
- (b) (15 pts) Design a process for your team's software development. (You may wonder how detailed your process should be. It is you who decides that but the process should not exceed one page.)

<sup>1</sup> Business Process Management Initiative (BPMI), *Business Process Modeling Notation (BPMN) Version 1.0*, May 3, 2004.

2. (10 pts) Compute **the unadjusted function point count** for a project with the following information domain characteristics:

Number of user inputs: 32  
 Number of user outputs: 60  
 Number of user inquiries: 24  
 Number of files: 8  
 Number of external interfaces: 2

Assume that all the weights (or complexity adjustment values) are average.

3. (15 pts) Consider an embedded system with the following characteristics:

Internal data structure: 6  
 External data structure: 3  
 Number of user inputs: 12  
 Number of user outputs: 60  
 Number of user inquiries: 9  
 Number of external interfaces: 36  
 Transitions: 24

(a) Assume that weights for both internal and external data structures are the same as internal files and the weight for transitions is always 1. Assume that the counts of the rest of the characteristics are evenly divided between simple, average and complex. Calculate **the unadjusted function point count**.

(b) Assume that the fourteen complexity adjustment factors are all average. Calculate **the function point** for the system.

4. (20 pts) The following table sets out a number of tasks, their durations and their dependencies. Draw a bar chart showing the project schedule.

Task	Duration(days)	Dependencies
T1	10	
T2	15	T1
T3	10	T1, T2
T4	20	
T5	10	
T6	15	T3, T4
T7	20	T3
T8	35	T7
T9	15	T6
T10	5	T5, T9
T11	10	T9
T12	20	T10
T13	35	T3, T4
T14	10	T8, T9
T15	20	T2, T14
T16	10	T15

5. (15 pts) Consider the task duration and dependencies table in the Lecture Slides on Planning.

Activity	Duration (days)	Dependencies
T1	8	
T2	15	
T3	15	T1 (M1)
T4	10	
T5	10	T2, T4 (M2)
T6	5	T1, T2 (M3)
T7	20	T1 (M1)
T8	25	T4 (M5)
T9	15	T3, T6 (M4)
T10	15	T5, T7 (M7)
T11	7	T9 (M6)
T12	10	T11 (M8)

Milestones are M1, ..., M8.

Assume that a serious unanticipated setback occurs and instead of taking 10 days, task T5 takes 40 days. Revise the activity network accordingly, highlighting the new critical path. Draw up new bar charts showing how the project might be reorganized.

