Behavioral characteristics of Process Models from which the provided event logs were generated.

This document contains information that can be used by contestants in order to tune their discovery algorithms.

The 10 events logs are generated from 10 different process models. The event logs only record the information about the order with which activities are completed. Therefore, there is no life-cycle transition information and, also, no timestamp information. However, these information types are not relevant for the contest in question.

Each of these models is characterized by the following aspects:

- **Sequences.** Certain activities need to be sequentially executed. For example, when a given activity A occurs, it is eventually followed by a certain activity B in all runs of the process.
- **Exclusive Choices.** Certain process model branches at given decision points are mutually exclusive. For example, a decision point exists between activity A and B. In any run of the process, if activity A is executed, then activity B cannot, or vice versa.
- **Parallel Executions.** Certain branches are "parallel", meaning that they can be completed in any order. For example, if a branch "A followed by B" is parallel to a branch "C followed by D", activities A, B, C and D can be executed in any order with the only constraint that B cannot finish before A and D cannot finish C. For instance, the execution runs <…, A, C, B, D> or <A, C, D, B> are valid whereas <A, D, C, B> is not, with the latter being because D cannot conclude before C concludes.

Each of these models can additionally contain some of the following characteristics:

- **Optional Activities.** Certain activities are optional and can be skipped in certain runs of the process.
- **Inclusive Choices.** Within the process, multiple sets of activities are optional, i.e. at least one set should be executed, but multiple sets of activities are also allowed. The difference with an exclusive choice resides on the fact that, in an exclusive choice, exactly one branch is activated; conversely, in an inclusive choice, more than one branch can be activate.
- **Recurrent activities:** Activities can be executed in multiple non-subsequent points during runs of the process.
- **DMN Tables**: DMN tables may be associated with exclusive choices. The DMN table at one exclusive choice can restrict the possibilities from all possible continuations to a subset of continuations. Note that DMN tables can also consider activities that were previously executed within the case. For instance, if an activity A is executed, then at a subsequent exclusive choice only activity X can occur; as further example, it is possible that, if an activity B is executed, then

at a subsequent exclusive choice only one activity between activity Y and activity Z is allowed. Note that this concept is strongly correlated with long-term dependencies.

Exclusive choices can be characterized by **balanced** or **unbalanced paths**. If an exclusive-choice is characterized by being balanced, in any run of the process, each mutually exclusive set of activities has equal probability of being chosen. If conversely it is unbalanced, one set has a 90% probability of being chosen and the other sets, together, have 10%, with each of them having the same probability. In the remainder, we generated event logs such that either all decision points are balanced or they are all unbalanced.

With reference to the characteristics above, the processes to which the generated the event logs refer to are as follows:

Optional Characteristics			Exclusive-choice decision points	Process model / Event Log
Optional activities	DMN Tables		Unbalanced Paths	1
Optional activities			Balanced Paths	2
Optional activities	Inclusive choices		Balanced Paths	3
Recurrent activities	Inclusive choices		Unbalanced Paths	4
DMN Tables			Balanced Paths	5
Inclusive choices			Unbalanced Paths	6
Recurrent activities			Balanced Paths	7
DMN Tables			Unbalanced Paths	8
Recurrent activities	DMN Tables		Balanced Paths	9
Recurrent activities	Optional Activities	DMN Tables	Unbalanced Paths	10