Reliability of Technical Systems
Tutorial #10
Due: December 7th, 2010

Assume there is a technical system in a factory, which is formed out of a high number of components (machines). The machines are designed either serial or parallel. Failed machines will be repaired by operators and taken back into service.

Operations department has the task to evaluate the overall reliability of the facility and to optimize the relation of parallel to serial machines as well as the optimal number of operators to maintain the machines. Operations department will apply object oriented modeling method to solve this problem and give reasonable recommendations.

Modeling of the fictive systems using state charts:

1. Identify relevant components which can be defined as objects.

2. Develop the state diagrams of each defined object above.

3. Define possible transitions and triggers of each state diagram.

4 Think about what will be messages passing between objects.

Solution to Tutorial #10 :

There are no absolute solutions for this tutorial ! How to develop identified components and corresponding state charts could vary based on each person's assumption. Here is just our solution for this tutorial.

In order to solve this question, we assume that

- 2 parallel identical machines (A and B) are included in the component of machine parallel
- Operator starts to repair the failed component only when both parallel machines fail.

Answer to Question 1:

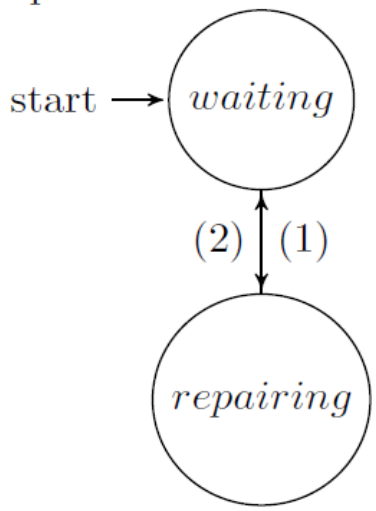
The relevant components to model as objects are:

- Operator
- Machine Parallel

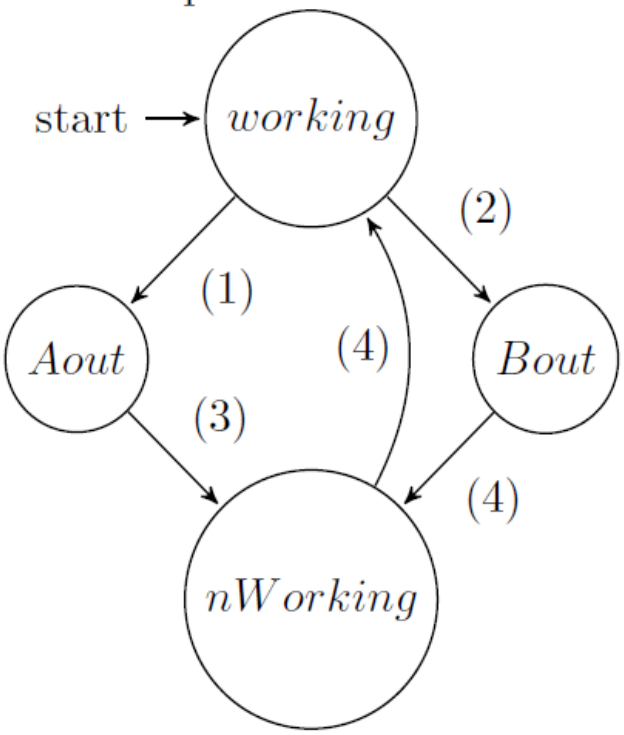
- Machine Series

Answer to Question 2 and 3:

- Operator:



- machine parallel:



- **Machine Serial**