Programming assembly line

Hands-on exercise 2

1. Overview of hands-on exercise 2 (tot.6p)

This hands-on exercise aims to teach basics of programming of modular production system (MPS).

Preliminary exercise is located below. Please read this material and answer the preliminary questions before attending the hands-on exercise. (1p)

During **actual hands-on exercise** you will have to deduce how the assembly line will behave based on the source code. At the end of exercise you will get a chance to program a small part of program running on distribution station using SFC.

Graded exercises are at the end of this document (5p)

2. Preliminary exercise

1. Read and find information about SFC-programming and answer the following question:

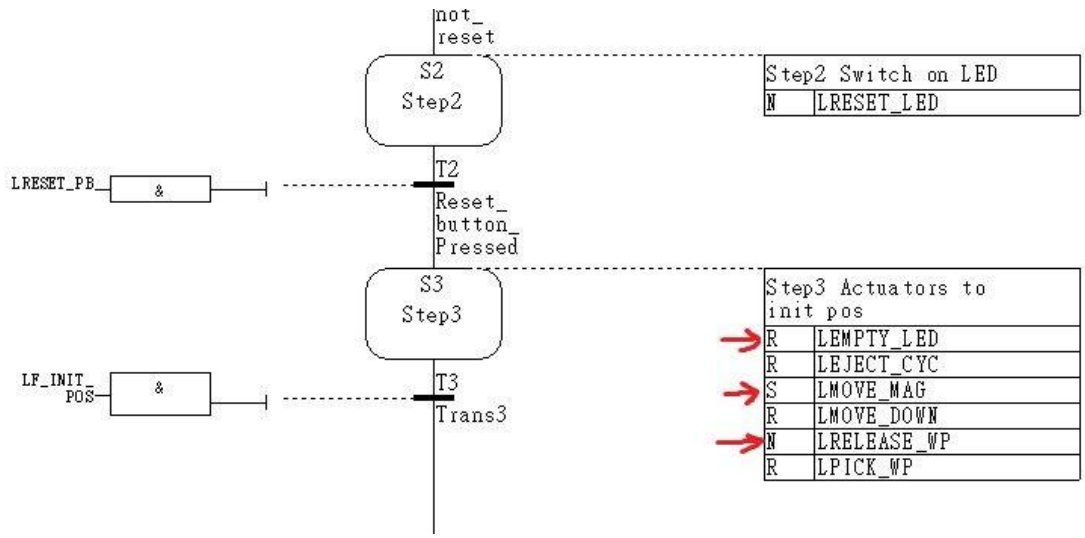
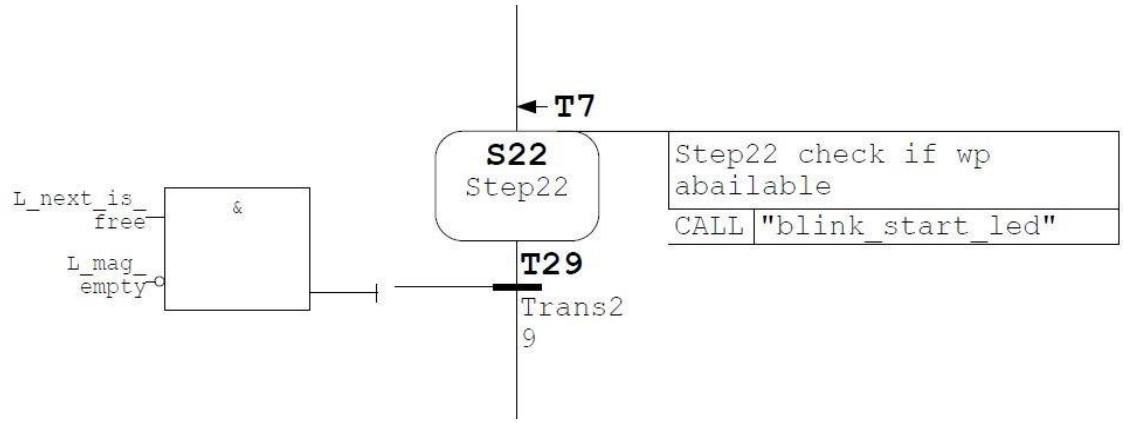


Figure 1: Example of SFC-code snippet.

- Tell the assistant at the beginning of exercise what do action association attributes R, S and N (Figure 1) do.

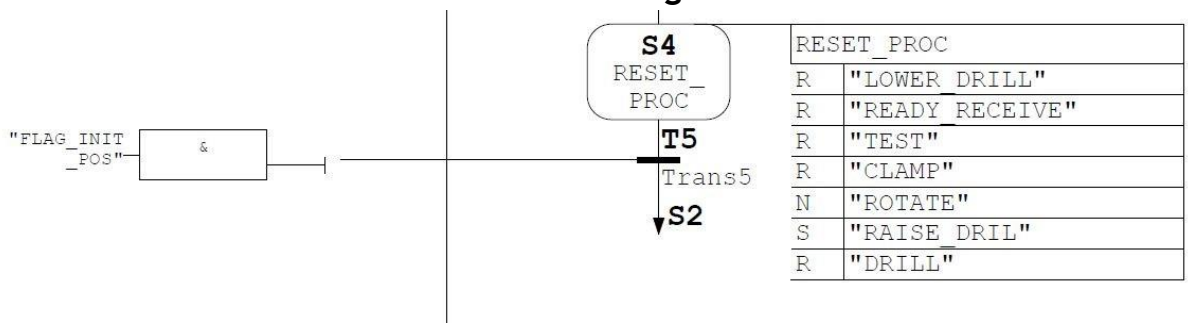
3. Graded exercises (1p/exercise, tot. 5p)

3.1. Exercise 1 - Code snippet from magazine module of distribution station.



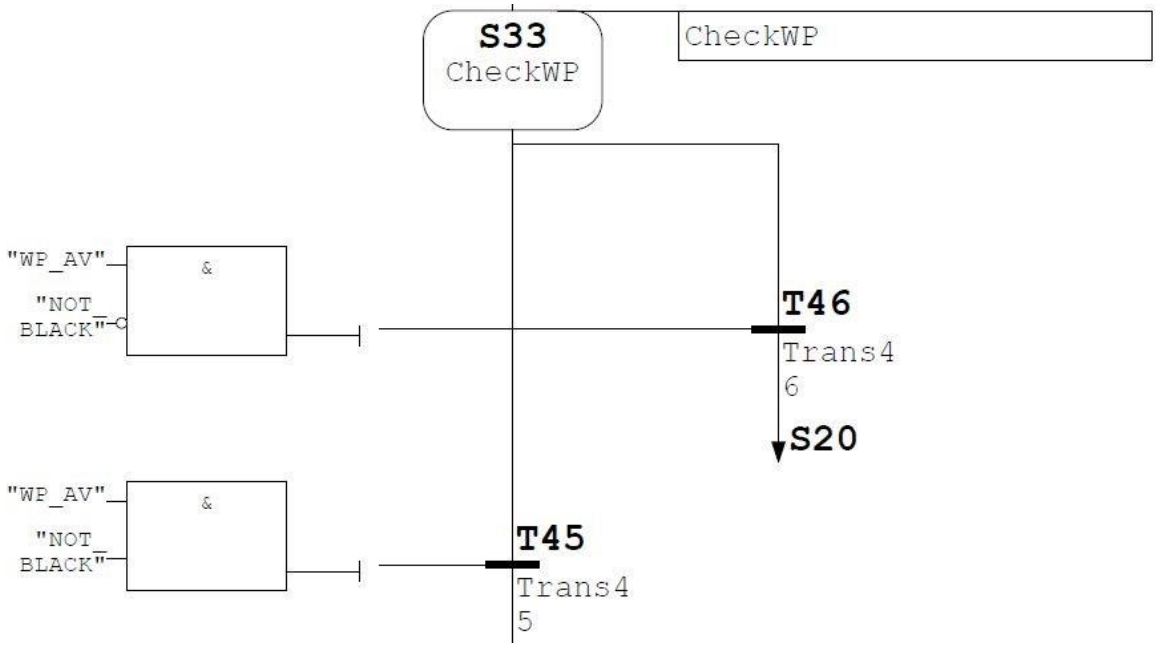
What values of boolean variables *L_next_is_free* and *L_mag_empty* will lead to transition **T29** being true?

3.2. Exercise 2 - Initialization of Processing Station



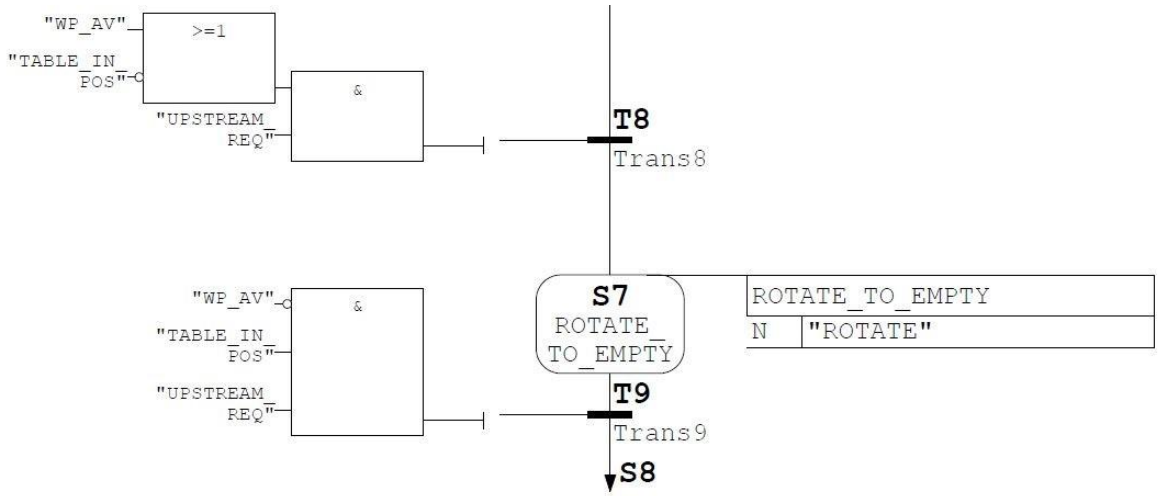
What will be the values of boolean variables of step **s4** at the beginning of next step?

3.3. Exercise 3 - Handling black workpieces at Testing Station



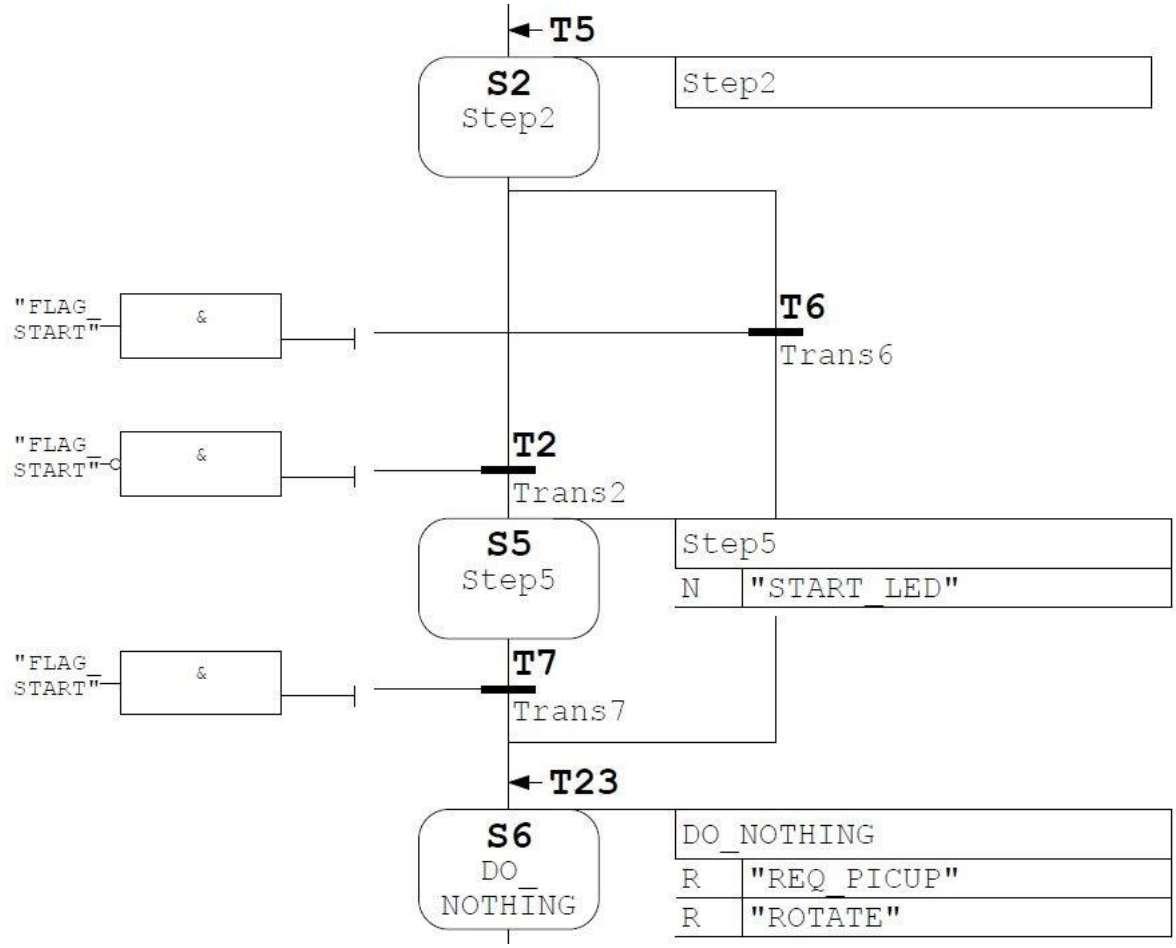
With what values of variables *WP_AV* (workpiece available) and *NOT_BLACK* program continues execution (transition **T45** is true) and with what values does it jump to step **s20** (transition **T46** is true)?

3.4. Exercise 4 - Code snippet from Processing station



List all the values of variables that result in transition **T8** being true. What happens during step **s7**?

3.5. Exercise 5 - Code snippet from Processing station



What happens between step **s2** and step **s6**?