ASSIGNMENT 01

Marks: 05

Submission Date: 25-March-2024

Student's Name:_____

Reg #: _____

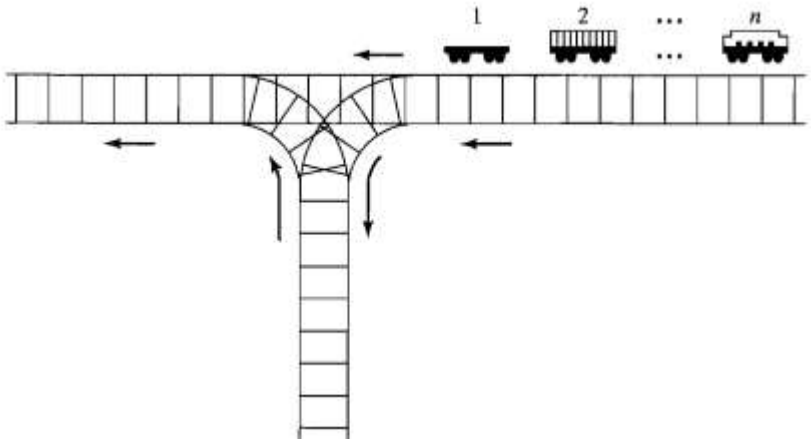
Marks Obtained:_____

Instructions.

1. Follow same format for assignment submission.
2. Copied/Plagiarized answers will be marked zero.
3. Output must be attached with the code

Scenario **CLO4, PLO3, C6**

Consider the following railroad switching network:



Railroad cars numbered 1,2, ..., n on the right track are to be permuted and moved along on the left track. A car may be moved directly onto the left track, or it may be shunted onto the siding to be removed at a later time and placed on the left track. The siding thus operates like a stack, a push operation moving a car from the right track onto the siding and a pop operation moving the "top" car from the siding onto the left track.

a. For *n = 3*, find all possible permutations of cars that can be obtained (on the left track) by a sequence of these operations. For example, push 1, push 2, move 3, pop 2, pop 1 arranges them in the order 3, 2,1. Are any permutations not possible?

b. Find all possible permutations for n = 4. What permutations (if any) are not possible?

c. Repeat (b) for *n = 5*.

Question

1. **Design** an algorithm for the above scenario. (2 marks)

2. **Create** a code in C++ that implements the above scenario. Test your program as the value of n mentioned above. (3 marks)