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Train Departure Scheduling Using Kleene Star and Petri Net Queue Model (Cicalengka–Padalarang)

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Abstract: The train is one of the public transport used by people to move between regions. PT Kereta Api Indonesia (PT KAI) is an Indonesian State-Owned Enterprise (BUMN) that provides rail transportation services. One of the railway lines belonging to KAI is a line which connects the towns of a province and is called the local railway. An example of a local train in the town is the one which connects Padalarang and Cicalengka subdistricts with the Bandung Raya Ekonomi Railway. The use of this local train is of high enough interest in the community because the price of train tickets is relatively cheap and it is relatively easy for the public to purchase train tickets. Train tickets can be purchased via the KAI Access application online or directly at the counter available at the local station. The entrance to the station is also very practical for the public in general, but because there are two methods of buying train tickets, it sometimes results in many queues in the ticket scanning process. In this paper, we discussed the ticket flow model for entering the Padalarang station in order to avoid any queue during the process of scanning the ticket. In addition, this paper discussed the effective time of train departure so that the time used for train operation is the optimal time. The method applied in this research is a Petri net for station entry flow modeling and the Kleene star algorithm for the effectiveness of train scheduling. The results of this study are useful for reducing queuing time before train departure and for effective train operating time. This research can be a reference for other researchers to develop a Petri net model and a reference for the government to optimize train departure time.

Keywords: *Petri net; queuing system; train; Kleene star algorithm; mathematical model.*

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