EASY AND EFFECTIVE RE-SCHEDULING OF TRAIN TIMETABLE FOR SRI LANKA RAILWAYS IN THE EVENT OF DELAY IN ONE OR MORE TRAINS

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Well over 350 turns of trains occur between Slave Island and Dematagoda daily which makes these two destinations the hub of the entire railway system. During a rush time period if any one of the trains gets delayed for some reason within the hub it creates a big traffic jam which ultimately affects the entire system. The basic objective of this research is to take measures to reduce delays of trains within the hub for an efficient and effective railway system throughout the country. We focus on 10 am to 11 am during weekdays within the hub and use graph colouring technique to address this situation. Hence the railway system is converted into a graph and use railway lines as edges and platforms & signal lights together as vertices. Then the adjacency matrix of our graph can be obtained. The adjacency matrix helps us to derive all these possible paths. When the first delayed train reaches the signal light of either side of the hub the vertex of the relevant signal light is given a specific colour. After checking the possible paths that this train can follow from the adjacency matrix and the existing train time table the path that the train can follow is selected. Once the path is selected the same colour is given to the platform at the end of this path which is considered as a vertex. Then this particular train can move along the vertices in the same colouring. Then considering the coloured path and existing time table we colour the rest of the graph. Based on this colouring and using the information about the time taken by a train to travel between two vertices the re-scheduled time table is prepared. This method can be extended to reschedule the existing time table per entire day in the event of delay.

Keywords: graph, vertex, edge, colouring, adjacency matrix