TDCARP: Data instances specification

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1 Introduction

This document describes the format of ARP-TD instances that are generated from EGL instances.

2 Data format

Each instance has two parts: instance information and network data.

2.1 Instance information

This part consists of first 10 lines as follows:
NAME : String - name of the instance
VERTICES : Integer - number of vertices
EDG_REQ : Integer - number of required edges
EDG_NONREQ : Integer - number of non-required edges.
VEHICLES : Integer - number of vehicles
CAPACITY : Integer - vehicle capacity
DEPOT : Integer - node id representing the depot.
STARTTIME : Integer - start time of planning horizon
ENDTIME : Integer - end time of planning horizon
SERVICE_SPEED_FACTOR : Float - service speed factor: the ratio of travel speed over service speed

2.2 Network data

This part starts from line 11 with keyword indicator **[NETWORK DATA]**. Each line represents the properties of an arc as follows:

$i\ j < dis > < demand > < nbPeriods > [endPeriod_1, ..., endPeriod_{nbPeriods-1}]$ $[travelSpeed_1, ...travelSpeed_{nbPeriods}]$

where:

- i, j are vertices of an arc (i, j)
- dis is the distance from i to j
- $demand$ is demand of an arc. If the value is zero, the arc is non-required arc.
- $nbPeriods$ is the number of periods. This value is randomly chosen from $[5, 7, 9]$
- $[endPeriod_1, ..., endPeriod_{nbPeriods-1}]$ is a list of end times of periods. These $nbPeriods - 1$ values are randomly chosen in planning horizon.
- $[travelSpeed_1, ...travelSpeed_{nbPeriods}]$ is a list of travel speeds of periods. These values are randomly generated from predefined speed distribution as following for $5, 7, 9$ periods, respectively:

$$\begin{pmatrix} 0.3 & 0.7 \\ 1.0 & 2.0 \\ 0.7 & 1.5 \\ 1.0 & 2.0 \\ 0.3 & 0.7 \end{pmatrix} \begin{pmatrix} 0.3 & 0.7 \\ 0.5 & 1.0 \\ 1.0 & 2.0 \\ 0.7 & 1.5 \\ 1.0 & 2.0 \\ 0.5 & 1.0 \\ 0.3 & 0.7 \end{pmatrix} \begin{pmatrix} 0.3 & 0.7 \\ 0.5 & 1.0 \\ 0.8 & 1.6 \\ 1.0 & 2.0 \\ 0.7 & 1.5 \\ 1.0 & 2.0 \\ 0.8 & 1.6 \\ 0.5 & 1.0 \\ 0.3 & 0.7 \end{pmatrix}$$