

Report

№: 5

MMC
Subject: Trolleybus problem

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1 Optimization of trolleybus schedule

Algorithm 1: Schedule optimization algorithm

```
1 last_sum = infinity
2
3 while True:
4     for each trolleybus number as nb:
5         Add a minute to all given stations for trolleybus nb;
6         Get the sum of squared intervals in all given stations;
7         Extract the added minute;
8
9     best_option = (Trolleybus number for which the sum was the minimum);
10
11    if (current smallest sum is bigger than last_sum):
12        break;
13    else:
14        last_sum = (current smallest sum);
15
16    Add a minute to the best_option trolleybus;
```

The result represents some delta times that should be added to each trolleybus in order for the waiting time between a trolleybus and the next one, is minimum.

Ex01 delta time in minutes:

24: 0, 25: 0, 10: 6, 7: 3

Ex02 delta time in minutes:

2: 6, 3: 7, 7: 8, 24: 0, 25: 5, 10: 4

Algorithm 1: Output

The first exercise can be solved as a specific case of the second problem.

2 Traffic load

Algorithm 2: Trolleybus count algorithm

```
1 Assign to each trolleybus a big enough number, as tr_count;
2
3 for each trolleybus number as nb:
4     while (number of trolleybusses is fine):
5         Extract from tr_count[nb] one;
6         Add to tr_count[nb] one;
```

Ex03 required number of transports:

2: 9, 3: 7, 7: 5, 24: 19, 25: 9, 10: 0

Algorithm 2: Output

As we can see, it's possible to exclude the trolleybus 10 for this exercise. Actually it's possible to exclude either trolleybus 10 or trolleybus 24, as there isn't any station where either only the trolleybus 10 or 24 comes.