Trabalho Prático 1 – Desenho

André Santos(up202108658) Diogo Silva(up202104794) Samuel Maciel(up202108697)

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Objetivo

Este projeto, tem como objetivo conceber uma ferramenta para analisar uma rede de comboios, de forma a encontrar os problemas e assim melhorá-la;

Dados

	B			
Name	District	Municipality	Township	Line
Porto Campanhã	PORTO	PORTO	Porto	Linha do Norte
Viana do Castelo	VIANA DO CASTELO	VIANA DO CASTELO	Viana do Castelo	Linha do Minho
Ermidas-Sado	SETÚBAL	SANTIAGO DO CACÉM	Ermidas-Sado	Linha do Sul
Faro	FAR0	FAR0	Faro	Linha do Algarve
Funcheira	BEJA	OURIQUE	Funcheira	Linha do Sul
Lisboa Oriente	LISBOA	LISBOA	Parque das Nações	Linha do Norte
Nine	BRAGA	FAMALICÃO	Nine	Linha do Minho
Pinhal Novo	SETÚBAL	PALMELA	Pinhal Novo	Linha do Sul
Pombal	LEIRIA	POMBAL	Pombal	Linha do Norte
Tunes	FAR0	SILVES	Tunes	Linha do Sul
Vila Nova de Gaia-Devesas	PORTO	VILA NOVA DE GAIA	Vila Nova de Gaia	Linha do Norte
Silva	BRAGA	BARCELOS	Silva	Linha do Minho
São Pedro da Torre	VIANA DO CASTELO	VALENÇA	São Pedro da Torre	Linha do Minho
Vila Nova da Raínha	LISBOA	AZAMBUJA	Vila Nova da Rainha	Linha do Norte
Estarreja	AVEIRO	ESTARREJA	Beduído e Veiros	Linha do Norte
Branca	AVEIR0	ALBERGARIA-A-VELHA	Branca	Linha do Vouga
Valongo-Vouga	AVEIRO	ÁGUEDA	Valongo do Vouga	Linha do Vouga
Mirão	PORTO	BAIÃO	Santa Cruz do Douro e São Tomé de Covelas	Linha do Douro
Oliveira	PORTO	AMARANTE	Vila Meã	Linha do Douro

Station_A	Station_B	Capacity ‡	Service \$
Casa Branca	Monte das Flores	8	STANDARD
Monte das Flores	Évora	8	STANDARD
Évora	Portalegre	10	STANDARD
Funcheira	Santa Clara-Sabóia		ALFA PENDULAR
Alferrarede	Mouriscas	6	STANDARD
Mouriscas	Mouriscas-A	6	STANDARD
Mouriscas-A	Alvega-Ortiga	2	STANDARD
Alvega-Ortiga	Barragem de Belver	2	STANDARD
Barragem de Belver	Belver	6	STANDARD
Belver	Barca da Amieira -Envendos	6	STANDARD
Barca da Amieira -Envendos	Fratel	6	STANDARD
Fratel	Ródão		STANDARD
Ródão	Tojeirinha	2	STANDARD
Tojeirinha	Sarnadas		STANDARD
Sarnadas	Retaxo	2	STANDARD
Retaxo	Benquerenças	2	STANDARD
Benquerenças	Alcains	10	STANDARD
Alcains	Lardosa	10	STANDARD
Lardosa	Soalheira	2	STANDARD

Interface

- •Menu;
- Inputs do utilizador;
- Algoritmos relevante;

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Classes

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- Menu;
- Graph;
- Station;
- Trip;
- •ReadData;

```
·----> MENU <------
1. Specific Station Information
2. Maximum number of trains that can simultaneously travel between two stations
3. Shortest path between two stations
4. Display the pair of stations that needs trains
5. Top-k municipalities/districts with highest budget needs
6. Max number of trains that can arrive at a train simultaneously
7. Maximum concurrent trains with minimal cost for the company between two stations
Station: Viana do Castelo
District: VIANA DO CASTELO
Municipality: VIANA DO CASTELO
Township: Viana do Castelo
Line: Linha do Minho
  ==> Connects to: Nine
      Capacity: 4
      Service: STANDARD
```

11: ⊨éncora Praia 12:Areia - Darque

```
l. Display station information within a given name
                                                                                                                                           1. Display station information within a given name
2. Display all stations in a specific district, municipality, or line
                                                                                                                                           2. Display all stations in a specific district, municipality, or line
                                                                                                                                           3. Back
4. Quit
                                                                                                                                           4. Quit
Enter your choice: 2
                                                                                                                                           Enter your choice: 2
Enter the District: PORTO
                                                                                                                                          Enter the Municipality: PORTO
All stations from District: PORTO
                                                                                                                                           All stations from Municipality: PORTO
l:Travagem
                                                                                                                                           1:Porto Campanh ú
2:Aregos
                                                                                                                                           2:Contumil
3:Bustelo
                                                                                                                                           3:Porto Siúo Bento
                                                                  1. Display station information within a given name
4:Francelos Norte
                                                                  2. Display all stations in a specific district, municipality, or line
5:Miramar
                                                                  3. Back
6:Ca-;de
                                                                  4. Quit
                                                                  Enter your choice: 2
B:Palmilheira
7:Francelos Sul
                                                                  Enter the letter corresponding to the category of stations you want to display: (d for district, m for municipality, or l for line): l
l1:Coimbr Áes
                                                                   Enter the Line: Linha do Minho
                                                                   All stations from Line: Linha do Minho
                                                                   1:Caminha
                                                                   2:Travagem
                                                                   5:Alvar-úes
                                                                   6:Palmilheira
                                                                   7:Barcelos
                                                                   10:Moledo do Minho
```

1. Specific Station Information
2. Maximum number of trains that can simultaneously travel between two stations
3. Shortest path between two stations
4. Display the pair of stations that needs trains
5. Top-k municipalities/districts with highest budget needs
6. Max number of trains that can arrive at a train simultaneously
7. Maximum concurrent trains with minimal cost for the company between two stations
8. Quit
Enter your choice: 2

Insert Source Station Name:Lisboa Oriente
Insert Destination Station Name:Entroncamento

22 trains have the capacity to travel concurrently between Lisboa Oriente and Entroncamento.

Maximum number of trains that can simultaneously travel between two stations
 Shortest path between two stations
 Display the pair of stations that needs trains
 Top-k municipalities/districts with highest budget needs
 Max number of trains that can arrive at a train simultaneously
 Maximum concurrent trains with minimal cost for the company between two stations
 Quit
 Enter your choice: 3

-----> MENU <------

1. Specific Station Information

Insert Source Station Name:Coimbra B
Insert Destination Station Name:Lisboa Oriente
Shortest path between Coimbra B and Lisboa Oriente:
Coimbra B ==> Pombal ==> Entroncamento ==> Lisboa Oriente
Total distance: 4

```
    Specific Station Information

2. Maximum number of trains that can simultaneously travel between two stations
3. Shortest path between two stations
4. Display the pair of stations that needs trains
Top-k municipalities/districts with highest budget needs
Max number of trains that can arrive at a train simultaneously
. Maximum concurrent trains with minimal cost for the company between two stations
8. Quit
Enter your choice: 4
Max: 22
Entroncamento - Santar ®m
Lisboa Oriente - Santar ®m
Santar ⊞m - Lisboa Oriente
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-----> MENU <-----
1. Specific Station Information
2. Maximum number of trains that can simultaneously travel between two stations
3. Shortest path between two stations
4. Display the pair of stations that needs trains
5. Top-k municipalities/districts with highest budget needs
6. Max number of trains that can arrive at a train simultaneously
7. Maximum concurrent trains with minimal cost for the company between two stations
8. Quit
Enter your choice: 5
District or Municipality? (d/m):
Amount to be displayed:
LISBOA requires 5414 trains.
AVEIRO requires 4866 trains.
LEIRIA requires 1674 trains.
PORTO requires 1526 trains.
SANTAR-ëM requires 1298 trains.
COIMBRA requires 1082 trains.
FARO requires 650 trains.
CASTELO BRANCO requires 506 trains.
BRAGA requires 506 trains.
SET-ÜBAL requires 506 trains.
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. Specific Station Information
  Maximum number of trains that can simultaneously travel between two stations
3. Shortest path between two stations
  Display the pair of stations that needs trains
  Top-k municipalities/districts with highest budget needs
  Max number of trains that can arrive at a train simultaneously
  Maximum concurrent trains with minimal cost for the company between two stations
8. Quit
Enter your choice: 5
District or Municipality? (d/m):
Amount to be displayed:
LISBOA requires 678 trains.
POMBAL requires 156 trains.
AVEIRO requires 134 trains.
COIMBRA requires 126 trains.
SINTRA requires 118 trains.
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ado and Marinha Grande.

-----> MFNU <------Specific Station Information Maximum number of trains that can simu 1. Specific Station Information el between two stations Shortest path between two stations 2. Maximum number of trains that can simultaneously travel between two stations Display the pair of stations that need Top-k municipalities/districts with hi 3. Shortest path between two stations eds 6. Max number of trains that can arrive a 4. Display the pair of stations that needs trains ultaneously Maximum concurrent trains with minimal 5. Top-k municipalities/districts with highest budget needs ompany between two stations Maximum number of trains with reduced 6. Max number of trains that can arrive at a station simultaneously 0uit 7. Maximum concurrent trains with minimal cost for the company between two stations Enter your choice: 6 8. Maximum number of trains with reduced connectivity 9. Quit Enter Station Name:Rio Tinto Enter your choice: 8 Rio Tinto can have 4 trains arriving at t and Tortosendo with a minimum cost of 180 euros. Insert Source Station Name: Valado Insert Destination Station Name: Marinha Grande 4 trains have the capacity to travel concurrently between Val

Dificuldades Encontradas



- Utilizar a pontuação portuguesa;
- Gestão do tempo;
- Esforço de cada elemento;