TrainHub

Dynamic Duo

Group members:

Matt Tonder:

- I am an international student from Perú, majoring in Cybersecurity. For this project, I contributed to creating diagrams, defining the project structure, conducting testing, and help developing both the front-end and back-end components.

Laura Martin (Team Leader):

- I am an international student from Spain majoring in Applied Mathematics and Computing. I'm also the team leader for our project, where I've been responsible for communication with Praharsha, developing backend code in C++, organizing the project phases, and conducting tests to identify and fix bugs in the backend.

Project Description

TrainHub

This project uses C++ to simulate a train network, with core functionality to read initial data from text files to populate a train list and passenger map. Key functions will include adding/removing passenger trips, displaying passenger trip details and listing passengers on specific trains. Following the C++ backend, a frontend website will be developed to present and manage this data interactively for users.

Project time goals:

Project time goals

- Met most deadlines:
  - **On schedule**: Project planning & backend development.
- **Challenges**:
  - Connecting frontend & backend.
  - Limited frontend experience.
  - Learning C++ while coding.
- **Achievement**:
  - Completed backend on time.
  - Gained deeper understanding of C++.

Progress since midterm:

Progress report:

Since the midterm, we decided to switch the programming language for our project, believing it would be a valuable challenge to learn a new language while working on the development.

We began adding more tasks to Trello, which greatly improved our organization. Additionally, we followed our Gantt chart to ensure we were meeting our goals on time.

Front-end development was one of the last tasks we tackled since neither of us had experience in that area. To overcome this, we watched videos and tutorials to learn the necessary skills.

Challenges in SE process:

Challenges:

The main challenge we faced was developing the software in C++, a language we were both still learning. However, this became a valuable learning experience, significantly expanding our knowledge of C++.

Another challenge was starting the project later than planned, which required us to quickly catch up and adjust our planning to meet deadlines. Additionally, deciding on a project idea took some time, but once we settled on it, we moved forward.

The most challenging part was connecting the back-end with the front-end. Although we tried using the Crow framework, we struggled to implement it effectively.

Certain back-end functions also proved to be especially difficult to develop.

Demo:

Demostration:


```
passenger.txt                    ×

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Passenger1: ID: 0701B Name: Kristen Address: College Age: 29 Gender: F BWeight: 24 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 2 Wagon: 1 Distance: 100
Passenger2: ID: 1006A Name: Matthew Address: Bloomfield Age: 29 Gender: M BWeight: 15 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 4 Wagon: 3 Distance: 100
Passenger3: ID: 1129H Name: Mercedes Address: Buchanan Age: 40 Gender: F BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 5 Wagon: 3 Distance: 100
Passenger4: ID: 1230M Name: Robert Address: Manchester Age: 23 Gender: M BWeight: 16 NTrips: 1 Date: 05:05:2024 Departure: Michigan Arrival: Cleveland Price: 55 Seat: 3 Wagon: 4 Distance: 220
Passenger5: ID: 1809A Name: Paula Address: Wildermere Age: 18 Gender: F BWeight: 20 NTrips: 2 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 1 Wagon: 1 Distance: 100 Date:
09:07:2024 Departure: Michigan Arrival: Columbus Price: 40 Seat: 1 Wagon: 1 Distance: 150
Passenger6: ID: 1828C Name: John Address: Cherry Age: 29 Gender: M BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 5 Wagon: 2 Distance: 100
Passenger7: ID: 1839C Name: Anne Address: LakeDr Age: 29 Gender: F BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 1 Wagon: 1 Distance: 120
Passenger8: ID: 1927K Name: Anthony Address: Hall Age: 16 Gender: M BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 4 Wagon: 2 Distance: 100
Passenger9: ID: 1936P Name: Max Address: Boston Age: 39 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 3 Wagon: 2 Distance: 120
Passenger10: ID: 1999C Name: Carl Address: Plymouth Age: 19 Gender: M BWeight: 18 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 3 Wagon: 1 Distance: 100
Passenger11: ID: 2345G Name: Raphael Address: Bloomfield Age: 38 Gender: M BWeight: 20 NTrips: 1 Date: 05:05:2024 Departure: Michigan Arrival: Cleveland Price: 55 Seat: 5 Wagon: 1 Distance: 100
Passenger12: ID: 2356R Name: Marcus Address: Griggs Age: 34 Gender: M BWeight: 12 NTrips: 1 Date: 05:05:2024 Departure: Michigan Arrival: Cleveland Price: 55 Seat: 2 Wagon: 1 Distance: 220
Passenger13: ID: 2367J Name: Lilian Address: Englewood Age: 19 Gender: F BWeight: 20 NTrips: 1 Date: 05:05:2024 Departure: Michigan Arrival: Cleveland Price: 55 Seat: 3 Wagon: 2 Distance: 220
Passenger14: ID: 2626K Name: Megan Address: Robinson Age: 39 Gender: F BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 4 Wagon: 3 Distance: 100
Passenger15: ID: 2645P Name: Liz Address: Fulton Age: 23 Gender: F BWeight: 21 NTrips: 1 Date: 05:05:2024 Departure: Michigan Arrival: Cleveland Price: 55 Seat: 1 Wagon: 2 Distance: 220
Passenger16: ID: 2678A Name: Mariah Address: Cascade Age: 50 Gender: F BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 1 Wagon: 2 Distance: 100
Passenger17: ID: 2772P Name: Katherine Address: Plymouth Age: 37 Gender: F BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 3 Wagon: 3 Distance: 100
Passenger18: ID: 2828D Name: Shawn Address: Rockford Age: 30 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 4 Wagon: 2 Distance: 120
Passenger19: ID: 2837B Name: Lewis Address: Aubum Age: 60 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 2 Wagon: 2 Distance: 120
Passenger20: ID: 2874A Name: Jacob Address: Fountain Age: 50 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 1 Wagon: 2 Distance: 120
Passenger21: ID: 2918T Name: Lourdes Address: Lyon Age: 10 Gender: F BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 3 Wagon: 1 Distance: 120
Passenger22: ID: 2928C Name: Michael Address: Lowell Age: 19 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 5 Wagon: 2 Distance: 120
Passenger23: ID: 2929J Name: Daniel Address: Manchester Age: 18 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 4 Wagon: 2 Distance: 120
Passenger24: ID: 3636A Name: Peter Address: Fuller Age: 20 Gender: M BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 4 Wagon: 2 Distance: 120
Passenger25: ID: 3738J Name: Paul Address: Lakeside Age: 20 Gender: M BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 4 Wagon: 2 Distance: 100
Passenger26: ID: 3836A Name: Andrea Address: Maryland Age: 40 Gender: F BWeight: 20 NTrips: 1 Date: 12:09:2024 Departure: Michigan Arrival: Detroit Price: 50 Seat: 5 Wagon: 1 Distance: 120
Passenger27: ID: 3838G Name: Chelsea Address: Maplewood Age: 27 Gender: F BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 2 Wagon: 1 Distance: 100
Passenger28: ID: 4562L Name: Sydney Address: Hampshire Age: 54 Gender: F BWeight: 12 NTrips: 1 Date: 05:05:2024 Departure: Michigan Arrival: Cleveland Price: 55 Seat: 1 Wagon: 2 Distance: 220
Passenger29: ID: 7282A Name: Adam Address: Woodland Age: 20 Gender: M BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 1 Wagon: 3 Distance: 100
Passenger30: ID: 9856H Name: Brigitte Address: Richards Age: 20 Gender: F BWeight: 20 NTrips: 1 Date: 01:04:2024 Departure: Michigan Arrival: Chicago Price: 50 Seat: 2 Wagon: 1 Distance: 100
```
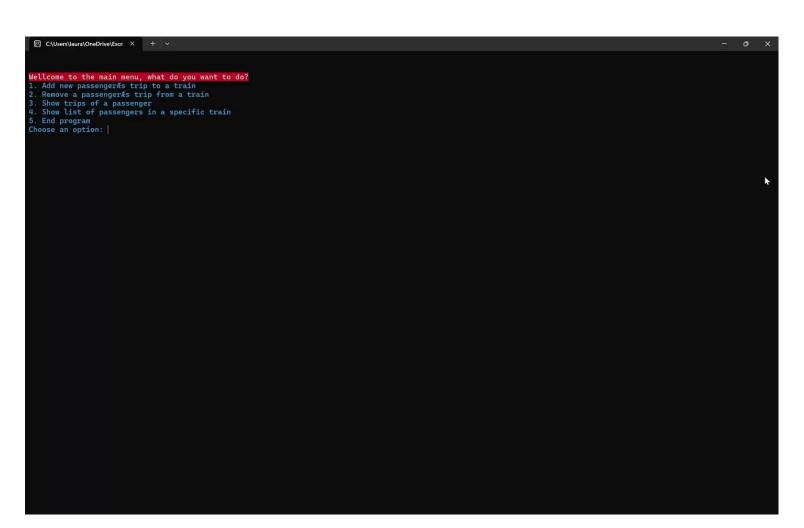
```
Wellcome to the main menu, what do you want to do?
1. Add new passenger´s trip to a train
2. Remove a passenger´s trip from a train
3. Show trips of a passenger
4. Show list of passengers in a specific train
5. End program
Choose an option: |
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TRAIN 1
Wagon: 1

NAME:Kristen    ID: 0701B   ADDRESS: College   SEAT: 2  AGE: 29  GENDER: F   BAG WEIGHT: 24
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Matthew    ID: 1006A   ADDRESS: Bloomfield   SEAT: 4  AGE: 29  GENDER: M   BAG WEIGHT: 15
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Robert    ID: 1230M   ADDRESS: Manchester   SEAT: 6  AGE: 23  GENDER: M   BAG WEIGHT: 16
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Paula    ID: 1809A   ADDRESS: Wildermere   SEAT: 1  AGE: 18  GENDER: F   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Carl    ID: 1999C   ADDRESS: Plymouth   SEAT: 3  AGE: 19  GENDER: M   BAG WEIGHT: 18
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Raphael    ID: 2345G   ADDRESS: Bloomfield   SEAT: 5  AGE: 38  GENDER: M   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Laura    ID: 9934A   ADDRESS: S.University   SEAT: 7  AGE: 20  GENDER: F   BAG WEIGHT: 12
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km


Wagon: 2

NAME:John    ID: 1828C   ADDRESS: Cherry   SEAT: 5  AGE: 29  GENDER: M   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Anthony    ID: 1927K   ADDRESS: Hall   SEAT: 4  AGE: 16  GENDER: M   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Mariah    ID: 2678A   ADDRESS: Cascade   SEAT: 1  AGE: 50  GENDER: F   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Paul    ID: 3738J   ADDRESS: Lakeside   SEAT: 3  AGE: 30  GENDER: M   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Brigitte    ID: 9856H   ADDRESS: Richards   SEAT: 2  AGE: 20  GENDER: F   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km


Wagon: 3

NAME:Mercedes    ID: 1129H   ADDRESS: Buchanan   SEAT: 5  AGE: 40  GENDER: F   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Megan    ID: 2626K   ADDRESS: Robinson   SEAT: 4  AGE: 39  GENDER: F   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km

NAME:Katherine    ID: 2772P   ADDRESS: Plymouth   SEAT: 3  AGE: 37  GENDER: F   BAG WEIGHT: 20
------------PASSENGERs TRIPS: 01:04:2024 Michigan Chicago 100km
```

Thank you!