

Introduction to **Databases with SQL**

Designing

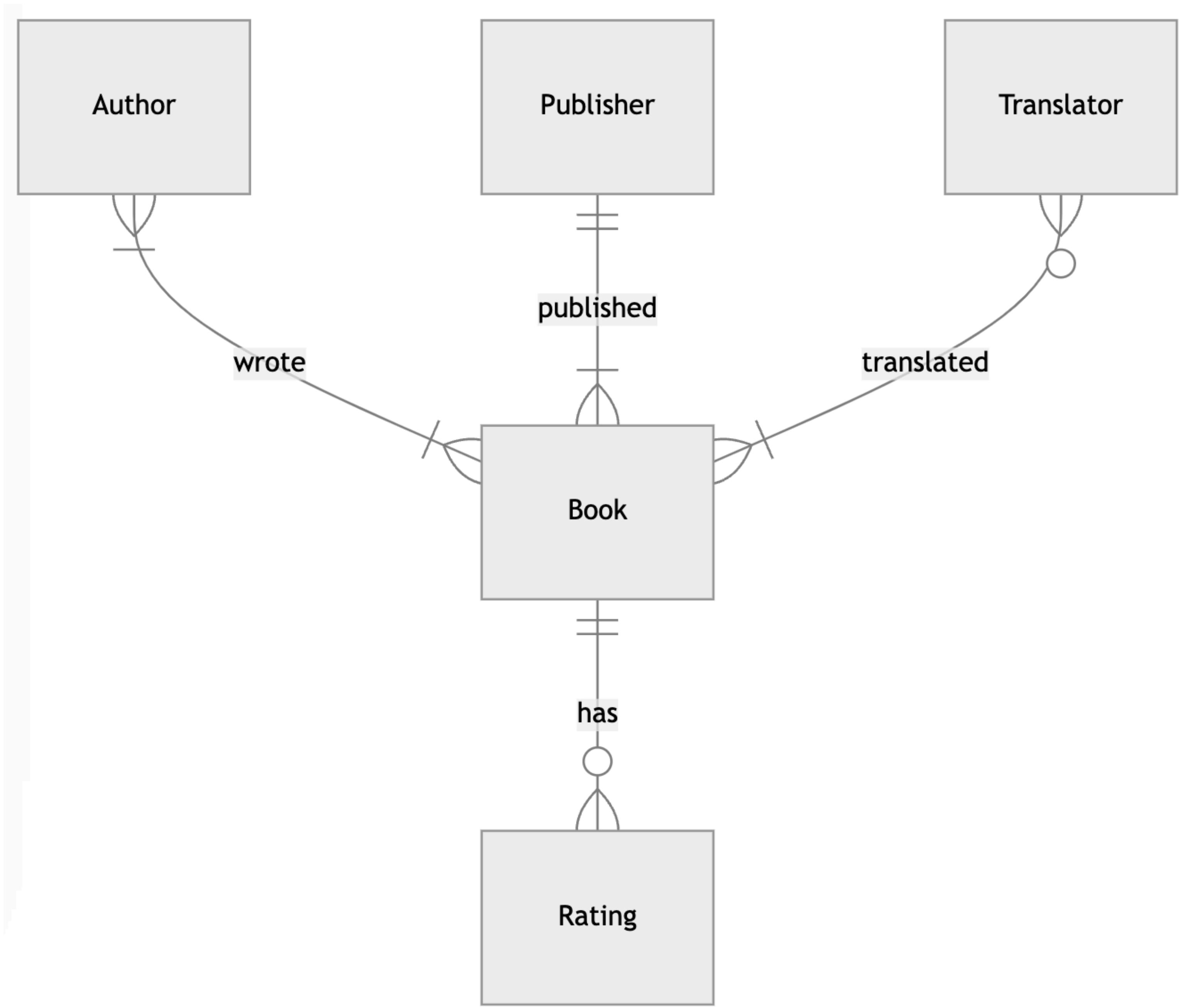


The Booker Prizes

sqlite3 FILENAME

SELECT

. schema



. schema TABLE



*653. WORK ON SEC. 5, LOOKING NORTHERLY.

Nov. 2'96.

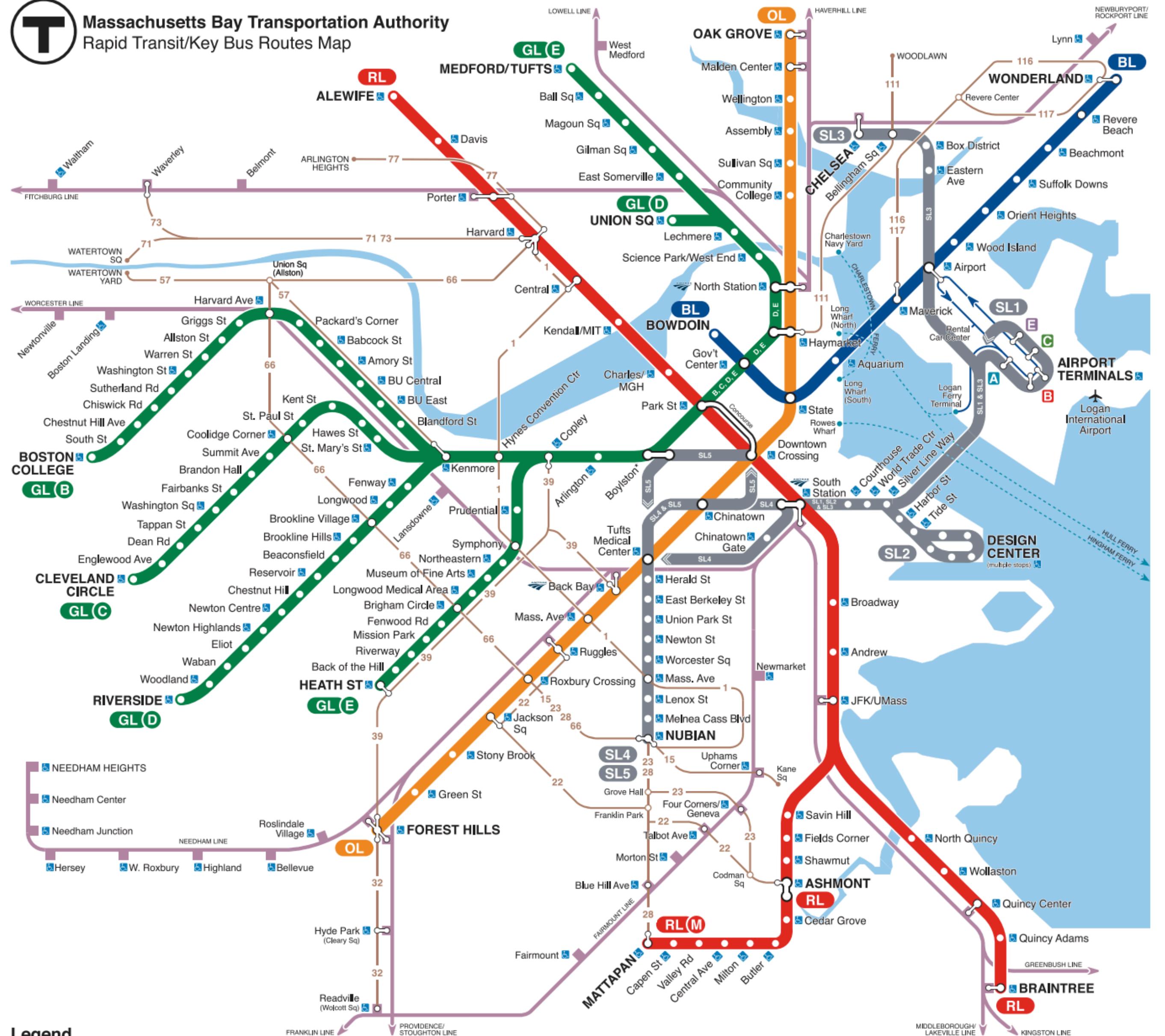




<https://www.flickr.com/photos/cityofbostonarchives/17616149584/in/album-72157653252196618/>



 **Massachusetts Bay Transportation Authority**
Rapid Transit/Key Bus Routes Map



Legend

- This section contains the MBTA map legend and various service icons. The legend includes color-coded boxes for the Red Line (Red), Silver Line (Light Blue), Mattapan Line (Maroon), Orange Line (Orange), Blue Line (Blue), and Green Line (Green). It also shows symbols for 'SILVER LINE and branches' (SL) with SL1 through SL5, 'COMMUTER RAIL' (purple square), 'KEY BUS ROUTE' (brown dashed line with '000'), 'FERRY' (blue dotted line), and 'Accessible station' (blue wheelchair icon). Below the legend, it says 'All MBTA and Massport bus and ferry services are accessible'. The service icons include a blue arrow for 'Free Logan Airport shuttle bus', a red circle with a white 'C' for 'Rapid Transit transfer station', a green circle with a white 'C' for 'Commuter Rail transfer station', and a grey Amtrak train icon for 'Amtrak service'. To the right, there are social media links for @MBTA (@TheMBTA on Twitter, Facebook, Instagram, YouTube, and TikTok) and contact information for Customer Communications & Travel Info (617-222-3200, 800-392-6100, TTY 617-222-5146, www.mbta.com) and MBTA Transit Police (911, TTY 617-222-1200). A note at the bottom states 'Boylston: Accessible for Silver Line only'.

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Not to scale

Schema

name	station
Charlie	Kendall/MIT

name	station	action
Charlie	Kendall/MIT	enter

name	station	action	fare
Charlie	Kendall/MIT	enter	10

name	station	action	fare	balance
Charlie	Kendall/MIT	enter	10	5

name	station	action	fare	balance
Charlie	Kendall/MIT	enter	10	5
Charlie	Jamaica Plain	exit	5	0

name	station	action	fare	balance
Charlie	Kendall/MIT	enter	10	5
Charlie	Jamaica Plain	exit	5	0
Alice	Harvard	enter	10	20

name	station	action	fare	balance
Charlie	Kendall/MIT	enter	10	5
Charlie	Jamaica Plain	exit	5	0
Alice	Harvard	enter	10	20
Alice	Park Street	exit	5	15

name	station	action	fare	balance
Charlie	Kendall/MIT	enter	10	5
Charlie	Jamaica Plain	exit	5	0
Alice	Harvard	enter	10	20
Alice	Park Street	exit	5	15
Bob	Alewife	enter	10	30

name	station	action	fare	balance
Charlie	Kendall/MIT	enter	10	5
Charlie	Jamaica Plain	exit	5	0
Alice	Harvard	enter	10	20
Alice	Park Street	exit	5	15
Bob	Alewife	enter	10	30
Bob	Park Street	exit	10	20

id	name	station	action	fare	balance
1	Charlie	Kendall/MIT	enter	10	5
2	Charlie	Jamaica Plain	exit	5	0
3	Alice	Harvard	enter	10	20
4	Alice	Park Street	exit	5	15
5	Bob	Alewife	enter	10	30
6	Bob	Park Street	exit	10	20

id	name	station	action	fare	balance
1	Charlie	Kendall/MIT	enter	10	5
2	Charlie	Jamaica Plain	exit	5	0
3	Alice	Harvard	enter	10	20
4	Alice	Park Street	exit	5	15
5	Bob	Alewife	enter	10	30
6	Bob	Park Street	exit	10	20

id	name	station	action	fare	balance
1	Charlie	Kendall/MIT	enter	10	5
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4	Alice	Park Street	exit	5	15
5	Bob	Alewife	enter	10	30
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id	name	station	action	fare	balance
1	Charlie	Kendall/MIT	enter	10	5
2	Charlie	Jamaica Plain	exit	5	0
3	Alice	Harvard	enter	10	20
4	Alice	Park Street	exit	5	15
5	Bob	Alewife	enter	10	30
6	Bob	Park Street	exit	10	20

riders

id	name
1	Charlie
2	Alice
3	Bob

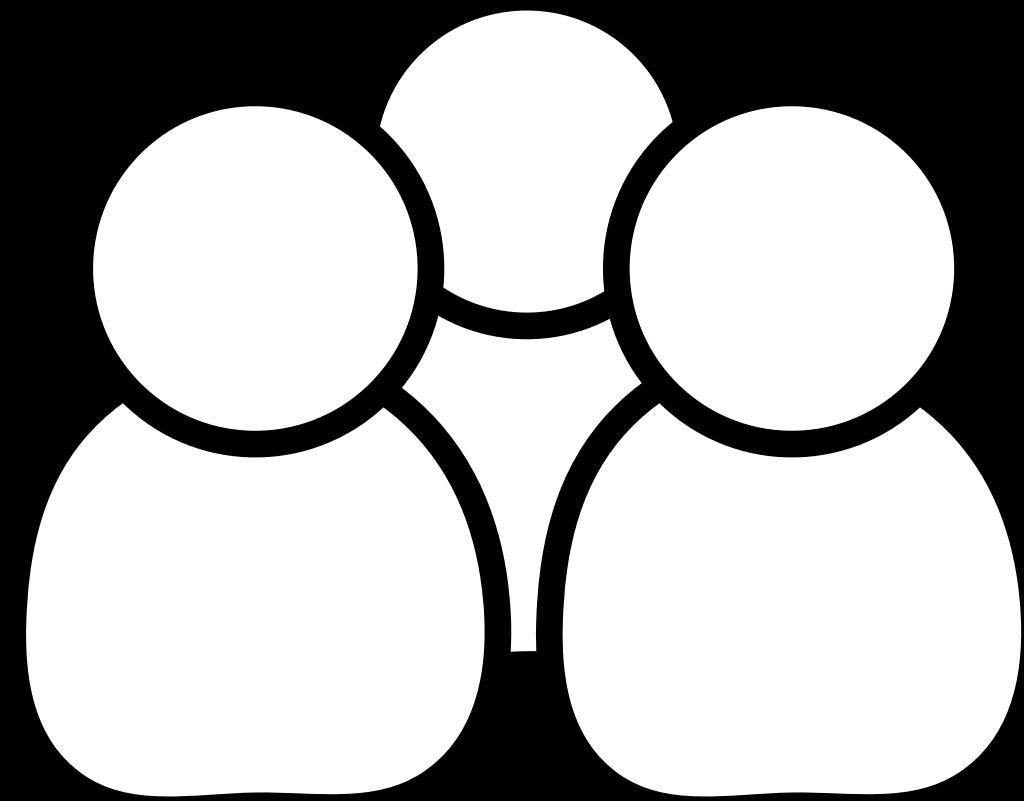
stations

id	location
1	Harvard
2	Kendall/MIT
3	Park Street

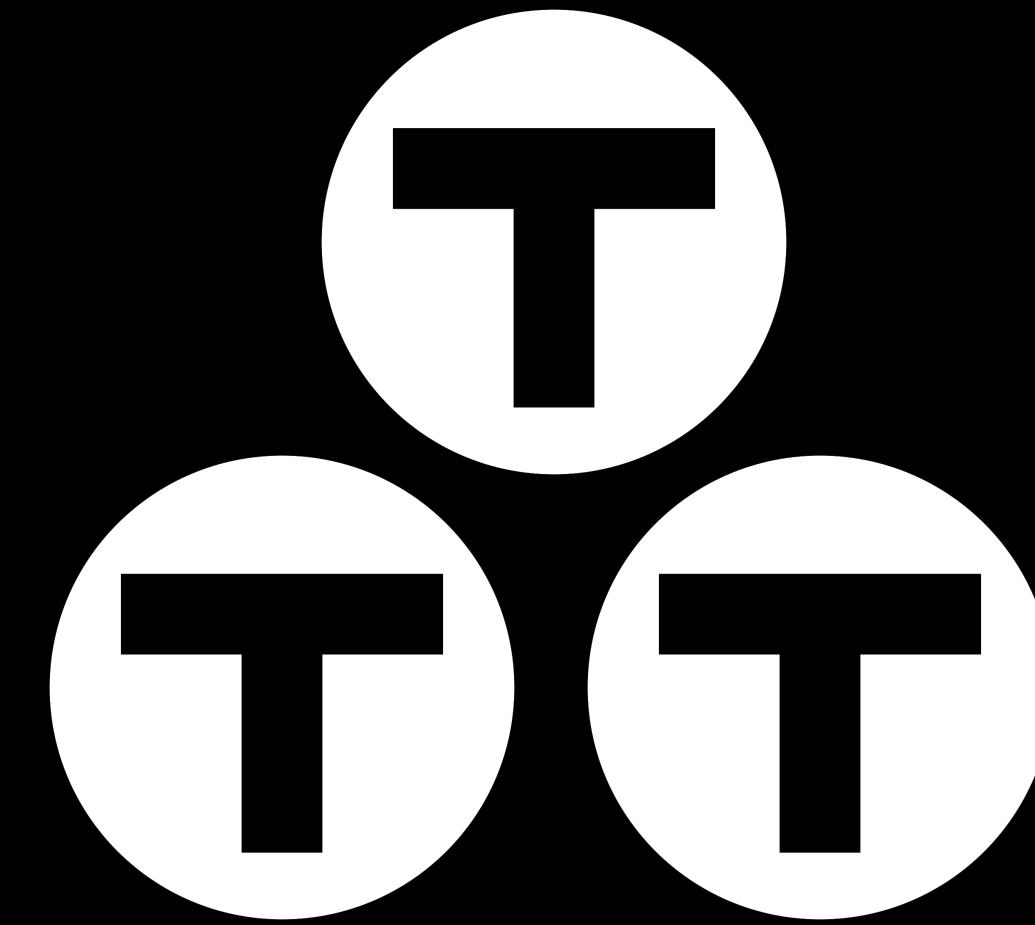
Normalizing

Relating

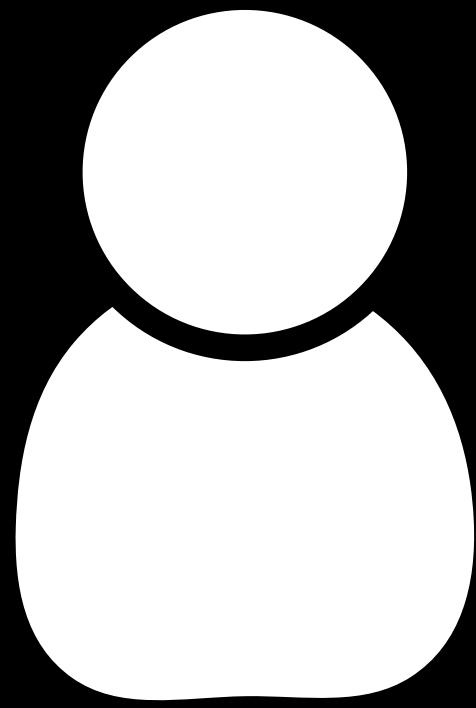
riders



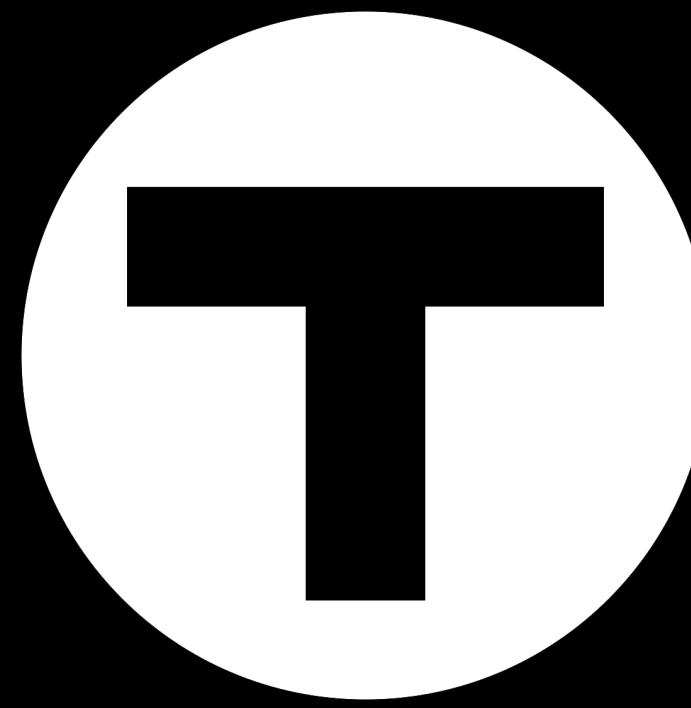
stations



rider

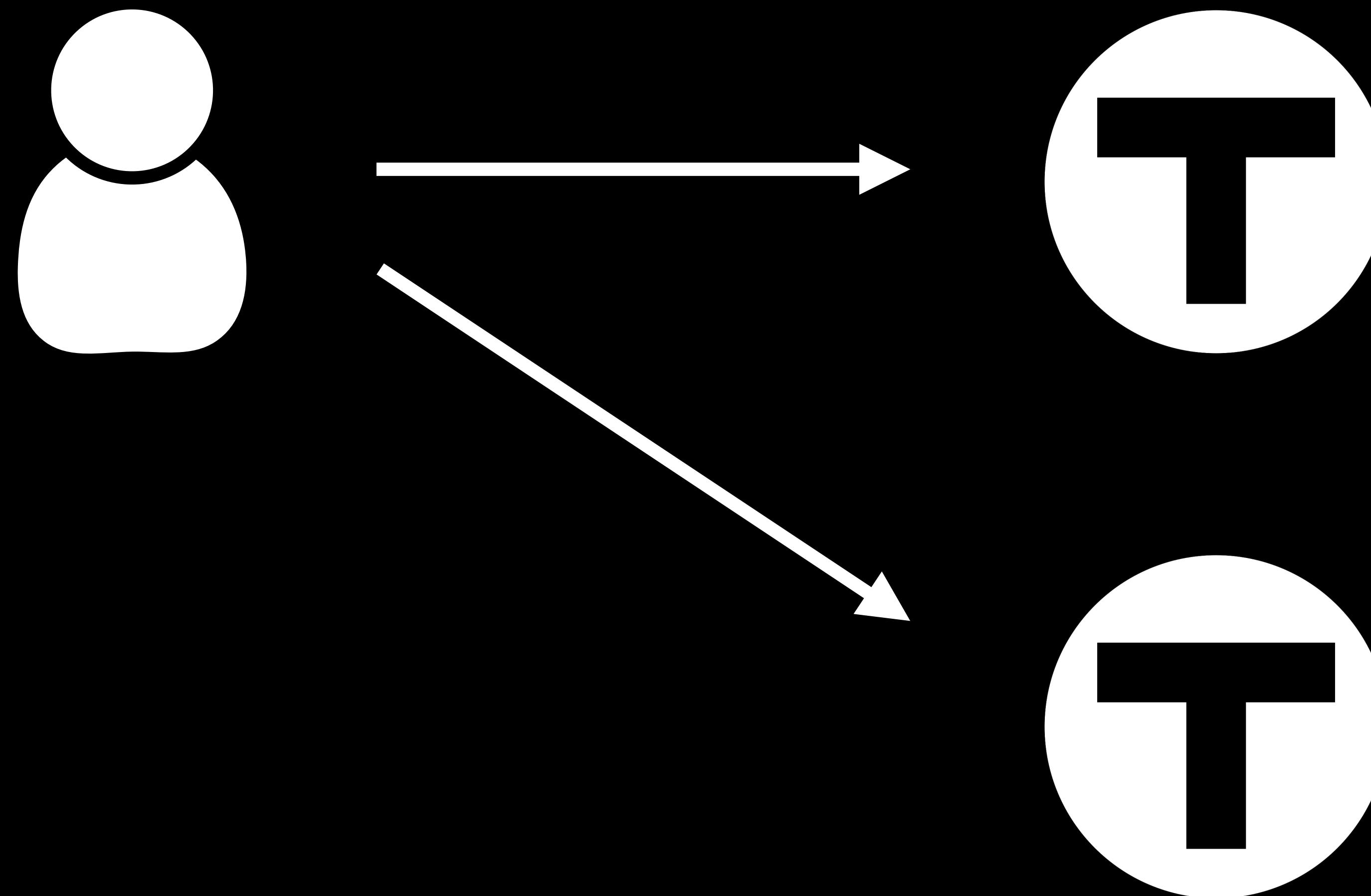


station



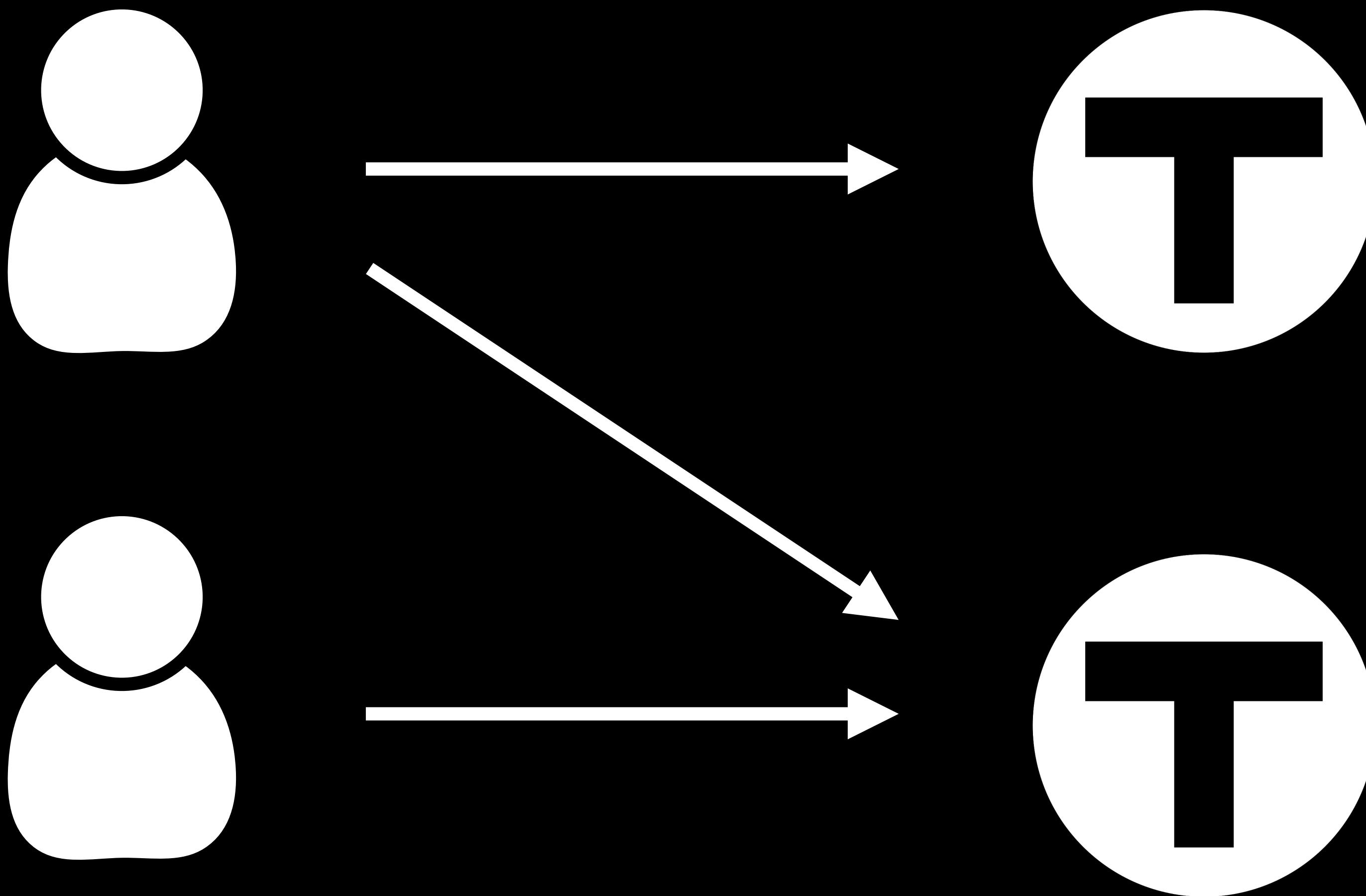
rider

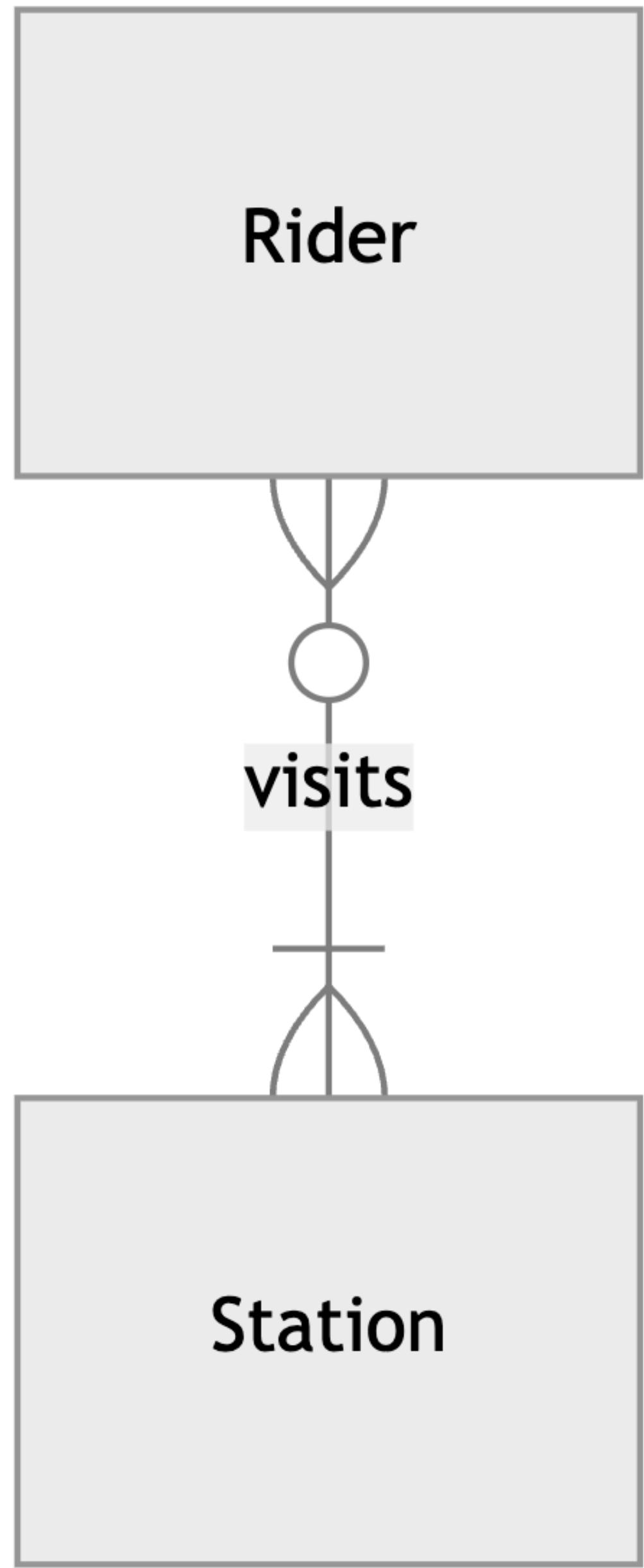
stations



riders

stations





CREATE TABLE

Data Types

Storage Classes

NULL

INTEGER

REAL

TEXT

BLOB

INTEGER

0-byte integer

1-byte integer

2-byte integer

3-byte integer

4-byte integer

6-byte integer

8-byte integer

"Red Line"



mbta.jpg

10

\$0.10

0.10

Type Affinities

TEXT

NUMERIC

INTEGER

REAL

BLOB

10

id	amount
10	

id	amount
1	"10"

25

id	amount
1	"10"

id	amount
1	"10"
2	"25"

"10"

id	amount

id	amount
1	10

"25"

id	amount
1	10

id	amount
1	10
2	25

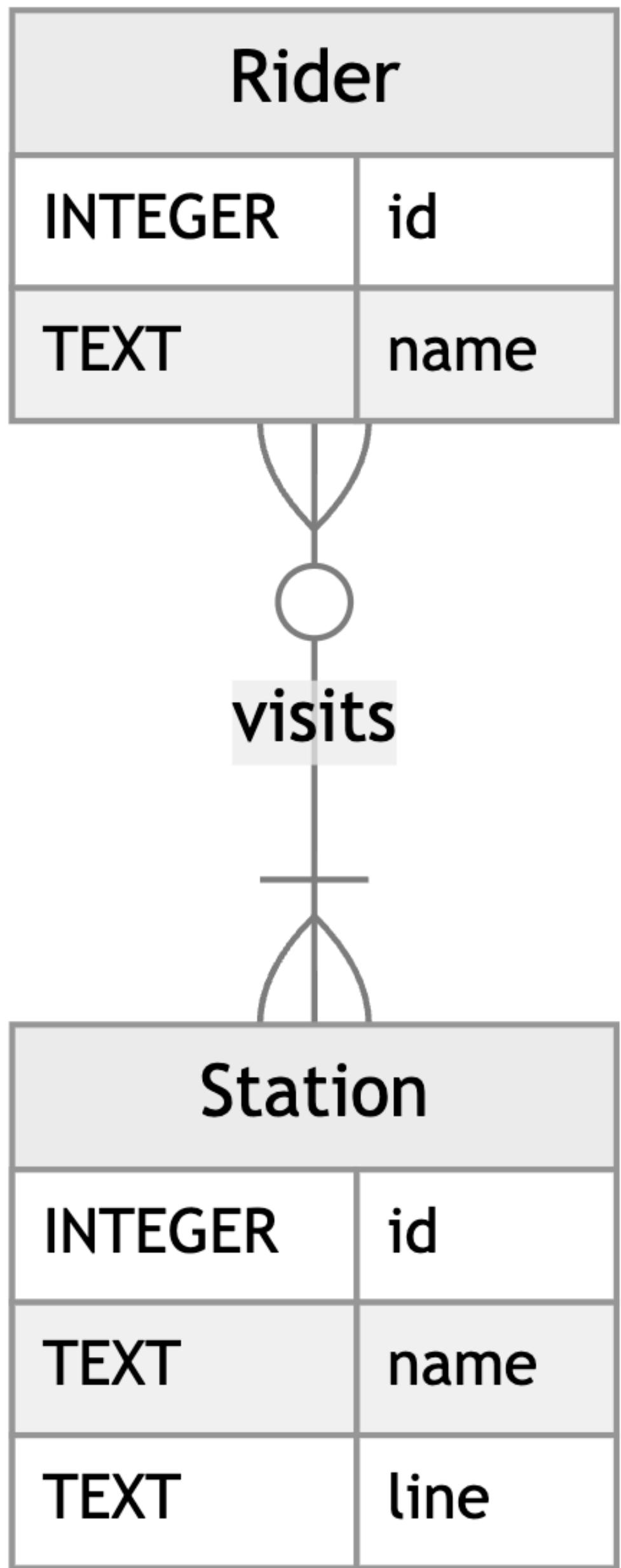


Table Constraints

PRIMARY KEY

FOREIGN KEY

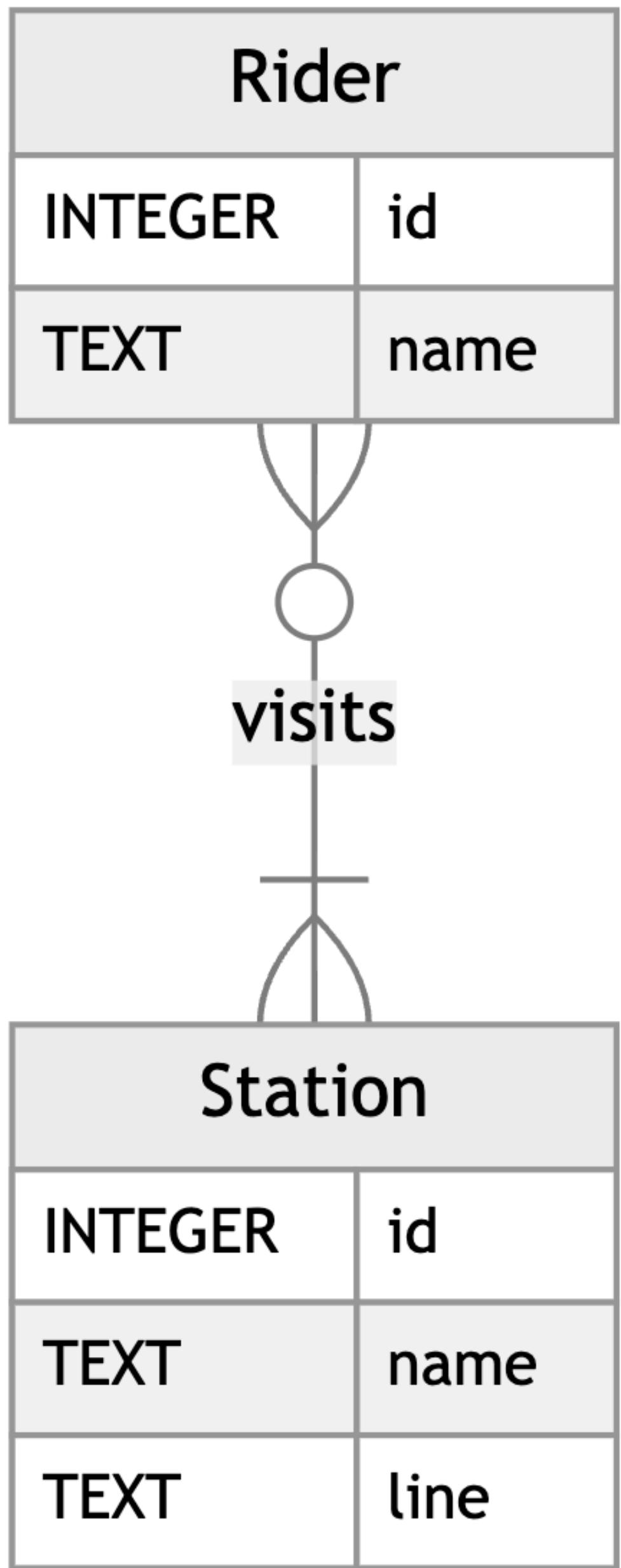
Column Constraints

CHECK

DEFAULT

NOT NULL

UNIQUE



CharlieCard



Massachusetts Bay Transportation Authority

Exp: 02/62

Break

CharlieCard

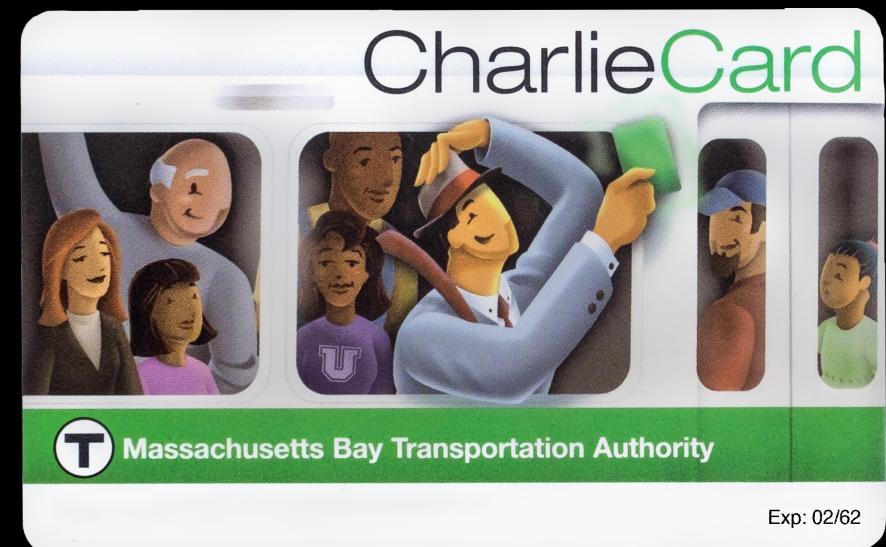
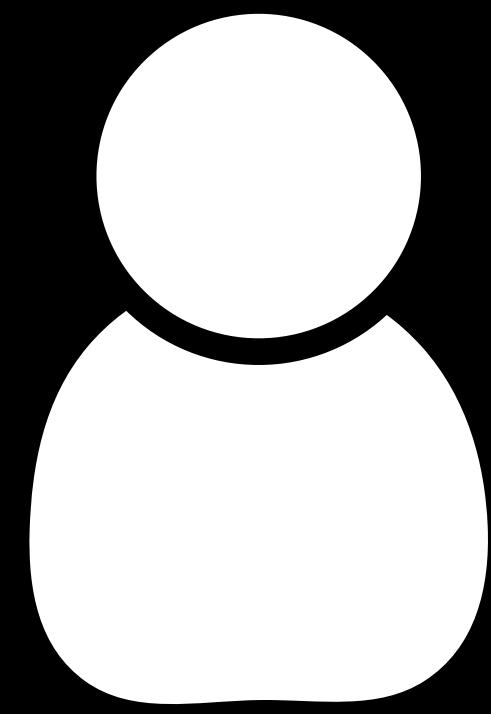


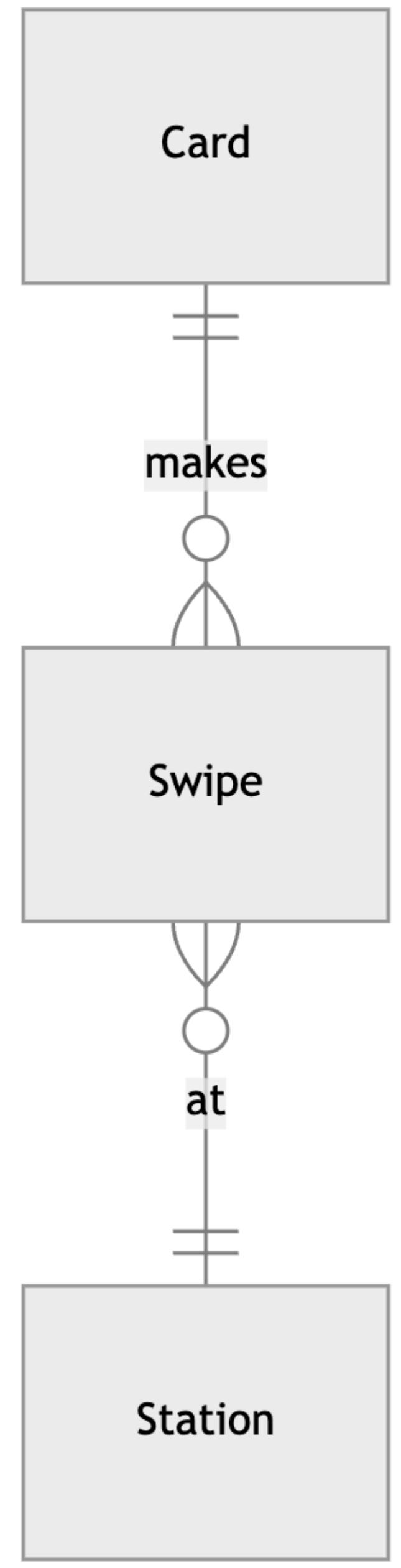
Massachusetts Bay Transportation Authority

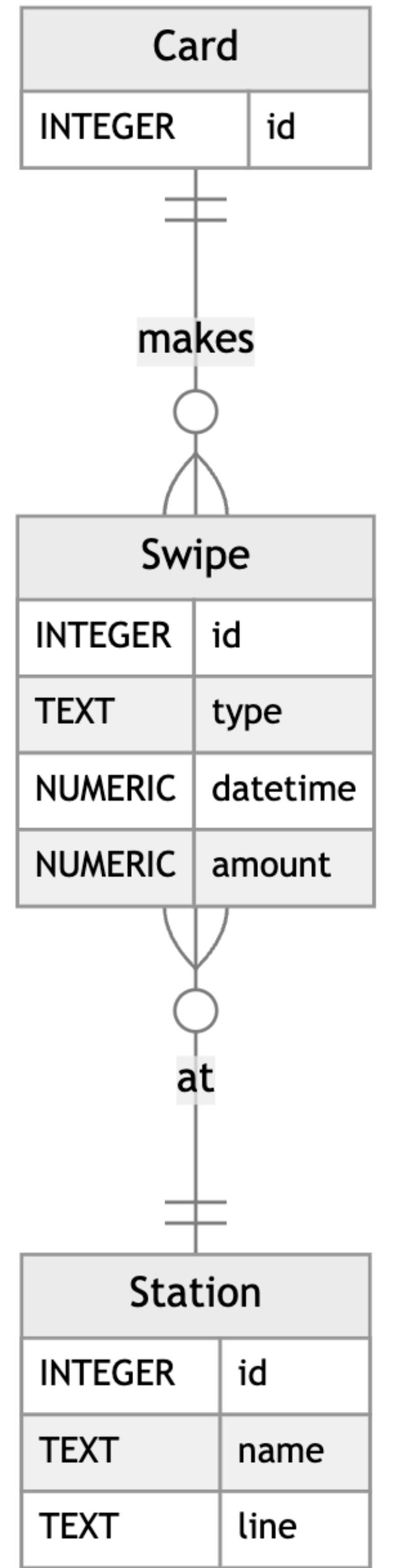
Exp: 02/62

Schema

rider card







Altering Tables

DROP TABLE

ALTER TABLE ...

RENAME TO ...

ADD COLUMN ...

RENAME COLUMN ... TO ...

DROP COLUMN ...

Column Constraints

CHECK

DEFAULT

NOT NULL

UNIQUE

CharlieCard



Massachusetts Bay Transportation Authority

Exp: 02/62

The Kingston TRIO

NEWPORT
FOLK FESTIVAL
CLASSICS



LivE at
NEWPorT

"Charlie handed in his dime at the Kendall Square Station
and he changed for Jamaica Plain.

When he got there the Conductor told him, 'One more nickel,'
Charlie couldn't get off of that train!"

Introduction to **Databases with SQL**

Designing