Real-Time Analytics for Rideshare App Optimization

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Agenda

01 Project Overview

02 Data Collection

03 Prediction Models

04 Q-Learning

05 Findings

06 Conclusion

Goal

Rideshare users minimize expenditures and allow rideshare drivers to maximize profits.

- Riders can input information about their upcoming routes to estimate the projected costs for each service
- Rideshare drivers can determine which region of Boston to target for a given weather status and time to maximize expected profits

Project Overview

Uber and **Lyft** are two of the leading rideshare services in Boston

Pricing changes due to demand, location, time, weather, car type, etc.

GOAL:

Create an interactive dashboard for users and drivers to help them optimize their rideshare decisions

Data Collection

STEP 1

Kaggle Dataset

Uber & Lyft rides from November and December 2018

STEP 2

Feature Selection

Price, weather, time of day, month, ride type

STEP 3

Data Preprocessing

One hot encoding, data cleaning

Prediction Models

Regression

Ridge, Lasso, OLS

Neural Network

Deep, Feed Forward

Trees

Random Forest,
XGBoost,
Decision Trees

Our prediction models determine the best app to use for your trip

Example

I'm traveling to Boston University from the financial district at 4 pm in November; clear weather, standard ride

Result

You should use Uber and it will cost you $16.22

Q-Learning

Q-Learning: Making route decision based off of rewards

Weather Conditions

Clear vs. Rainy

Time of Day

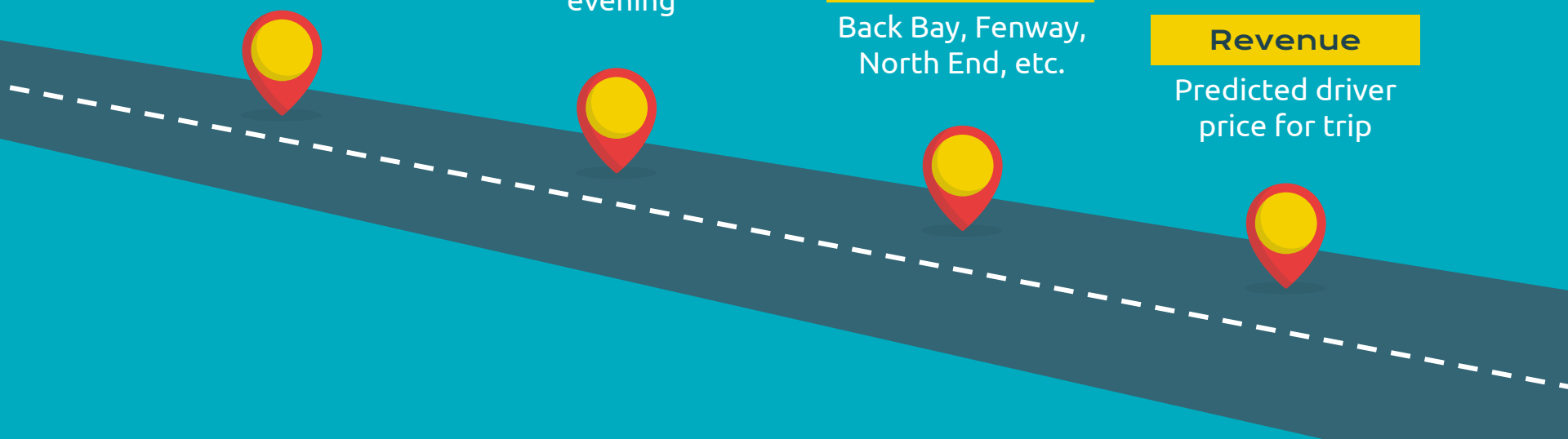
Morning, afternoon, evening

Start Location

Back Bay, Fenway, North End, etc.

Revenue

Predicted driver price for trip



Using Q learning to determine the optimal route for drivers

Example

I’m in the financial district at 5 pm on a Friday; clear weather

Result

You should accept a ride that goes to south station in order to maximize long term income from rides

Results from the Q-Table reveal revenue maximizing practices for drivers

Key Takeaways

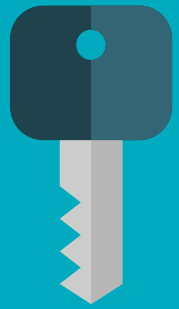
- Haymarket, South Station and Infanical District are the most profitable regions
- Key driver timings are 5 to 7 PM (workdays) and 10PM (weekends)

Results/Impact

Users

- Time Savings
- Cost Savings
- Uber usually better
- Average savings of $0.36 - $0.56 per ride

Rideshare



Drivers

- Income Increase
- Popular locations
- Schedule Management
- Reduce Idleness

Thank You

Questions?

8. Key Findings from Q-Learning

APPENDIX

6.Price comparison interface

DON’T DRINK

Venus has a really beautiful name

6. Conclusion

01

VENUS

Venus has a really beautiful name

02

JUPITER

Jupiter is the biggest planet

03

SATURN

Saturn is a planet with several rings

04

EARTH

Earth is the third planet from the Sun

05

NEPTUNE

It’s the farthest planet from the Sun

06

MARS

Mars is actually a very cold place

Driving center company profile infographics

STRATEGY ROADMAP				
Q1	Q2	Q3	Q4	
✗	✗	✗	✓	TRAFFIC
✓	✗	✗	✗	ROAD SIGNS
✓	✗	✗	✗	CROSSWALKS
✗	✗	✗	✓	PARKING
✓	✓	✗	✗	PEDESTRIANS

Driving center company profile infographics

WHAT TO DO IN CASE OF AN ACCIDENT		
01	STOP THE CAR	Mercury is very small
02	CALL THE POLICE	Venus is very hot
03	TAKE PHOTOS	We all live on Earth
04	DESCRIBE THE ACCIDENT	Mars is a red planet
05	FIND WITNESSES	Jupiter is a big planet
06	CALL A LAWYER	Saturn has beautiful rings

Driving center company profile infographics

DOS

- Jupiter is a gas giant and the biggest planet
- Mercury is the closest planet to the Sun
- Venus is the second planet from the Sun
- Earth is the third planet from the Sun

DON'TS

- Neptune is the farthest planet from the Sun
- Despite being red, Mars is a cold place
- Saturn is a gas giant and has several rings
- Ceres is located in the main asteroid belt

Driving center company profile infographics

01

MECHANICAL CHECK

Venus has a beautiful name

02

VISUAL INSPECTION

Jupiter is the biggest planet

03

VEHICLE HISTORY

Saturn is a planet with rings

Driving center company profile infographics

50%

LIGHT BULBS

Jupiter is a gas giant and the biggest planet

75%

HEADLIGHTS

Mercury is the closest planet to the Sun

25%

TURN SIGNALS

Venus is the second planet from the Sun

Driving center company profile infographics

HOW TO CHANGE A TYRE

01

PLACE JACK

Venus has a really beautiful name

02

REMOVE NUTS

Jupiter is the biggest planet of them all

03

SLIDE WHEEL

Saturn is a planet with several rings

Driving center company profile infographics

HOW TO CHANGE A TYRE

04

SET ASIDE

Venus has a really beautiful name

05

SPARE TYRE

Jupiter is the biggest planet of them all

06

SCREW NUTS

Saturn is a planet with several rings

Driving center company profile infographics

DRIVING CENTER	FIRST PAYMENT	SECOND PAYMENT	THIRD PAYMENT
THEORY	$1,000	$2,000	$2,000
PRACTICE	$1,000	$1,500	$3,000
TEST	$200	$250	$300

Driving center company profile infographics

A **REARVIEW MIRROR**

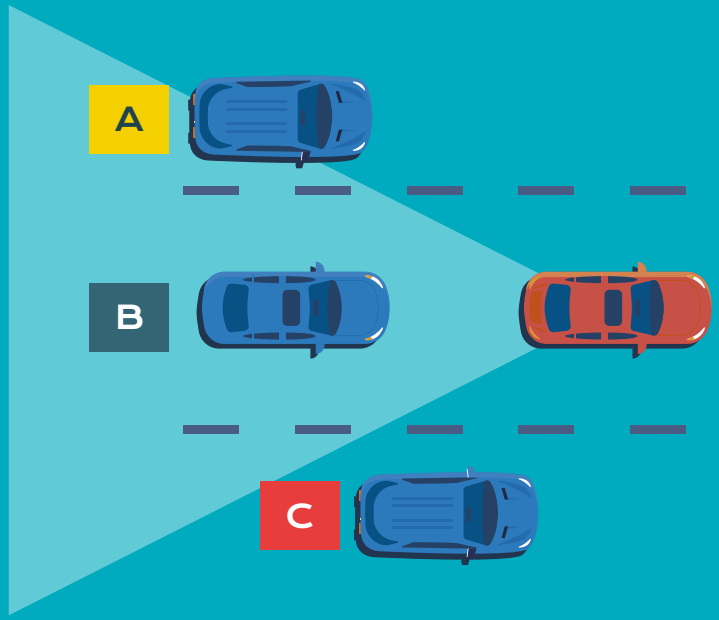
Venus has a beautiful name

B **DRIVER MIRROR**

Jupiter is the biggest planet

C **BLIND POINT**

Saturn is a planet with rings



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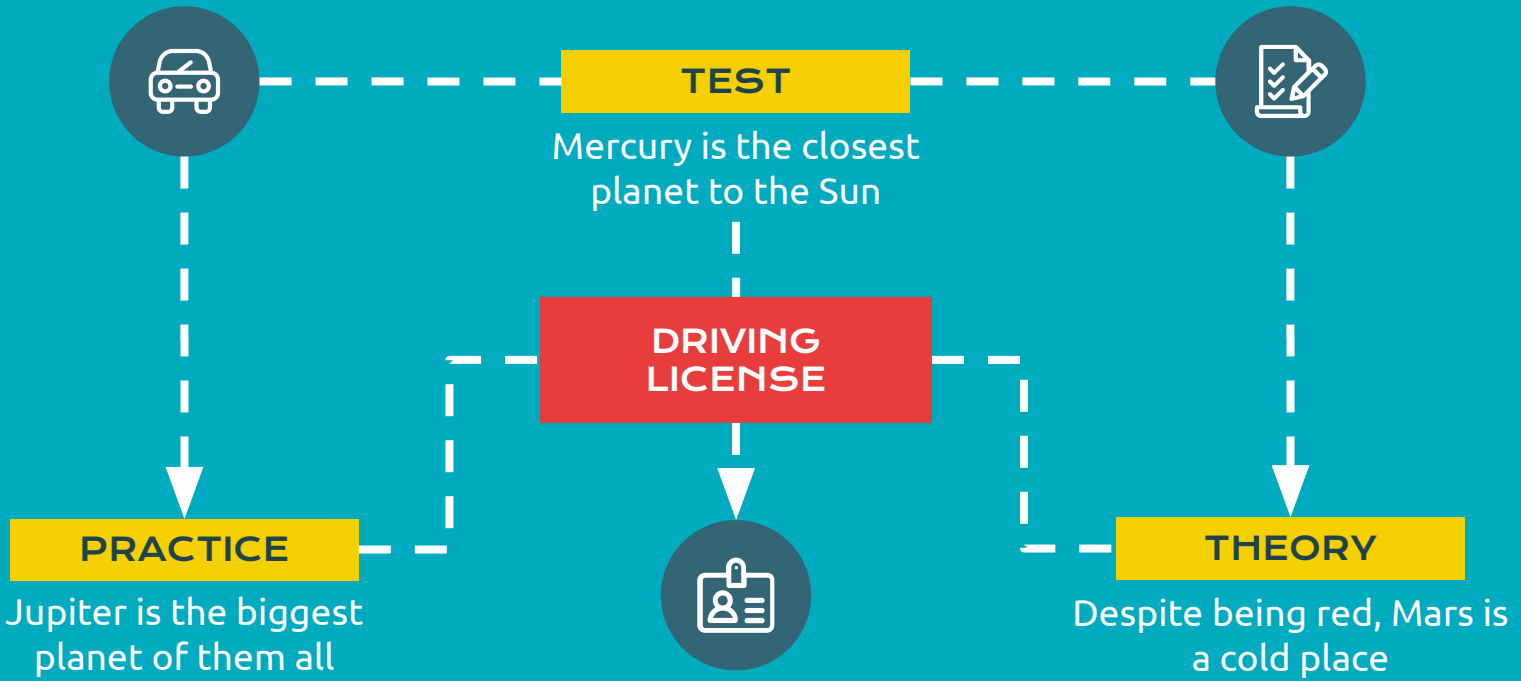

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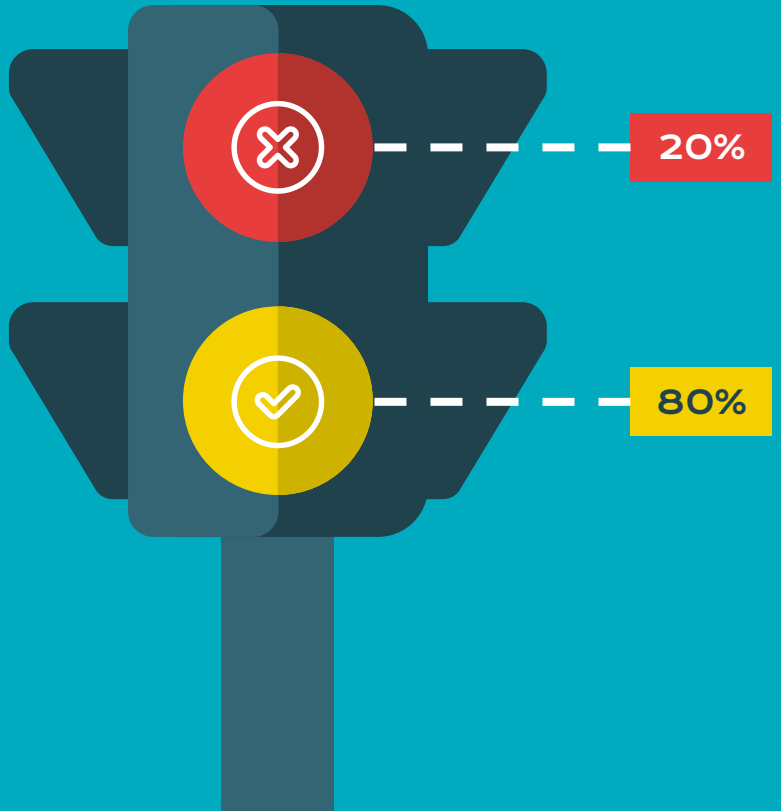
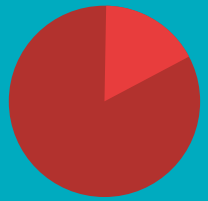


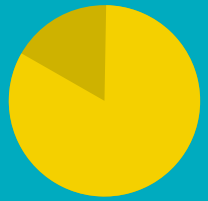
20%



FAILED

Venus has a really beautiful name

80%



PASSED

Saturn is a planet with several rings

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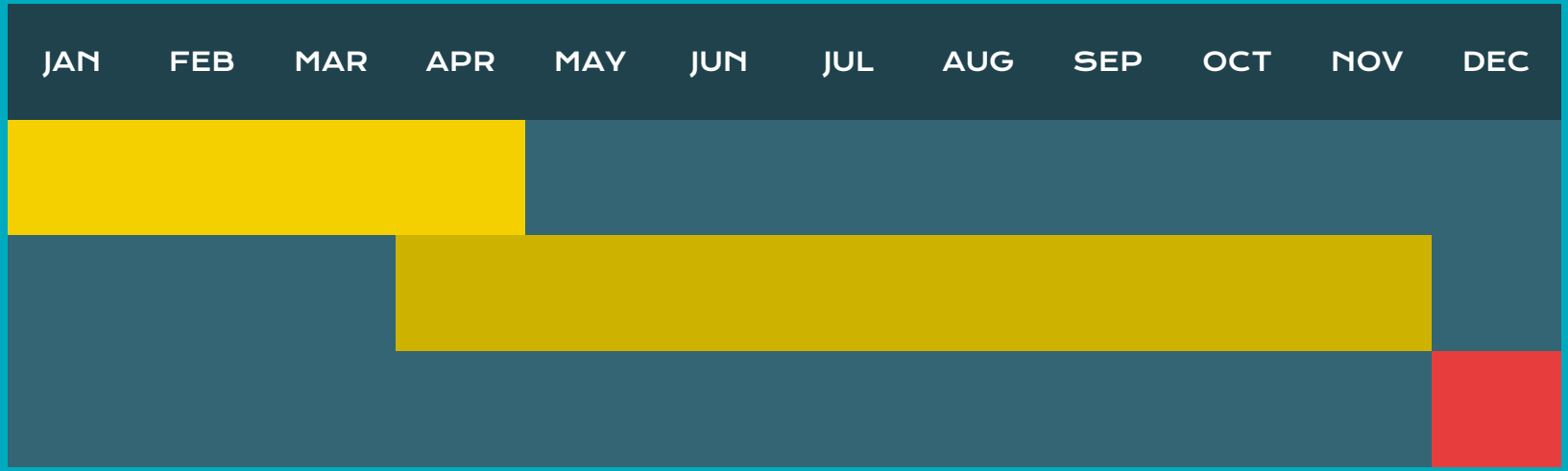


THEORY

Mercury is the closest planet to the Sun

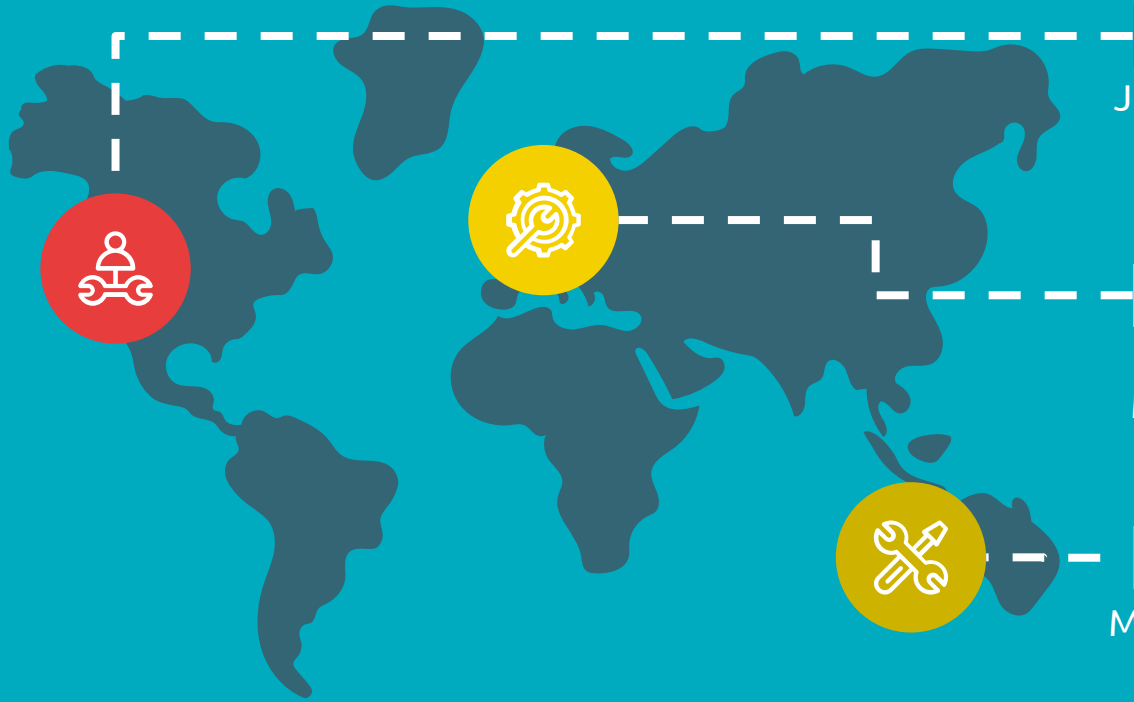
PRACTICE

Despite being red, Mars is a cold place

TEST

Jupiter is a gas giant and the biggest planet

Driving center company profile infographics



CENTER 1

Jupiter is the biggest planet of them all

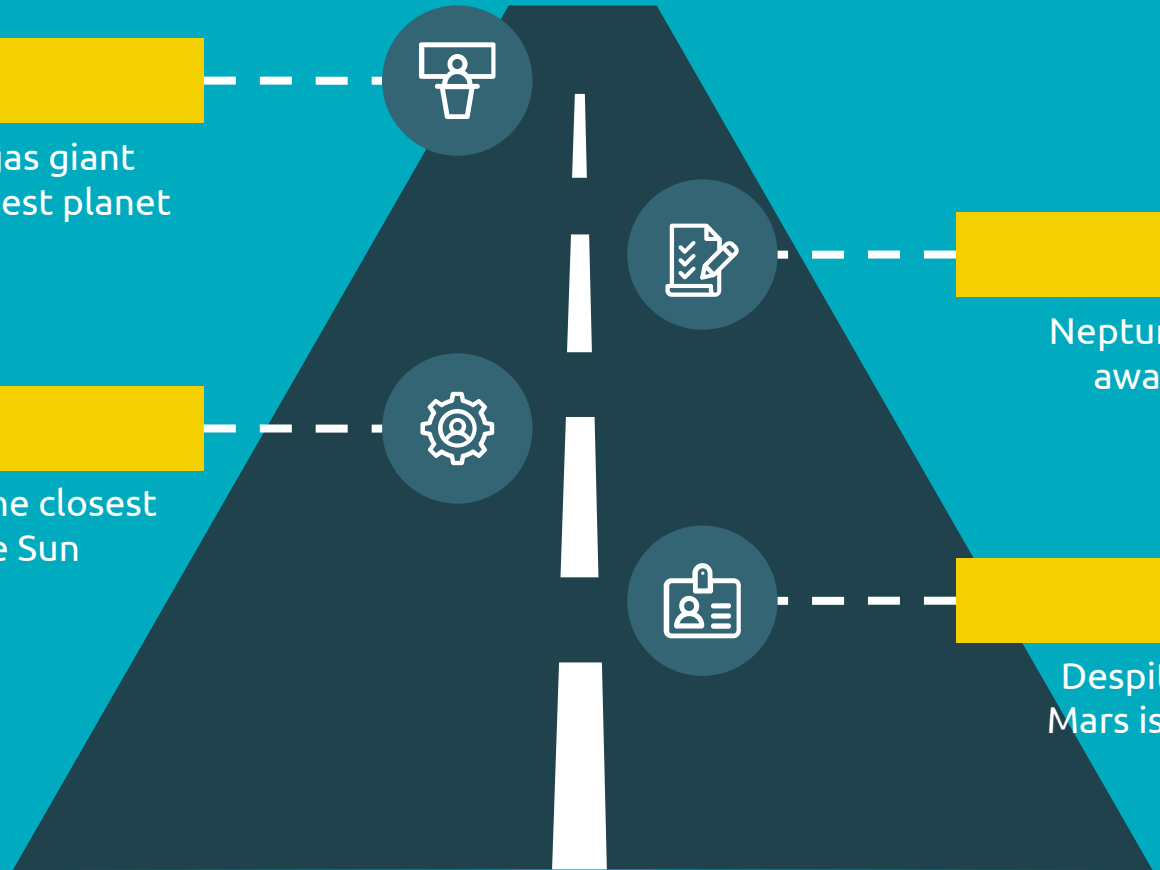
CENTER 2

Despite being red, Mars is a cold place

CENTER 3

Mercury is the closest planet to the Sun

Driving center company profile infographics



THEORY

Jupiter is a gas giant and the biggest planet

PRACTICE

Mercury is the closest planet to the Sun

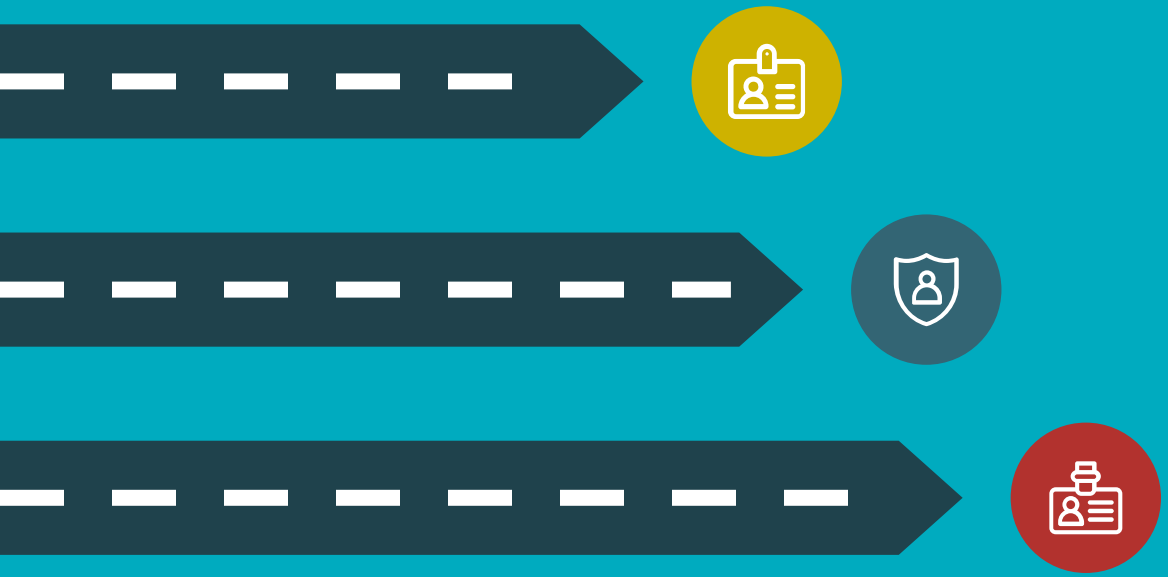
TEST

Neptune is very far away from Earth

LICENSE

Despite being red, Mars is a cold place

Driving center company profile infographics



MOST REQUESTED

01 CLASS D

Neptune is very far away from Earth

02 CLASS E

Mercury is the closest planet to the Sun

03 JUNIOR LICENSE

Despite being red, Mars is a cold place

Driving center company profile infographics

01

CLASS A TEST

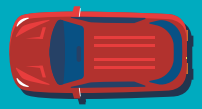
Jupiter is a gas giant and the biggest planet

JANUARY						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
					01	02
03	04	05	06	07	08	09
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

02

CLASS E TEST

Mercury is the smallest planet of them all



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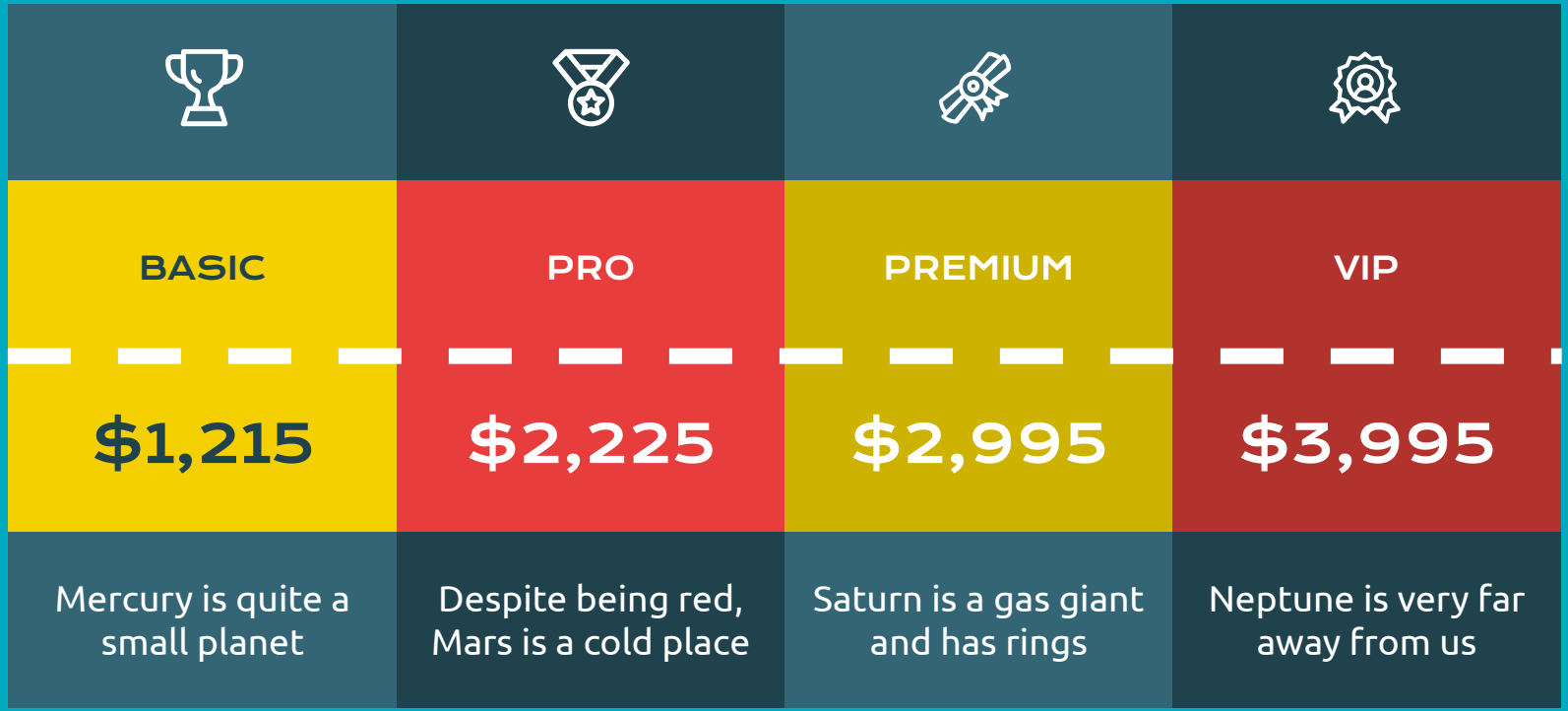
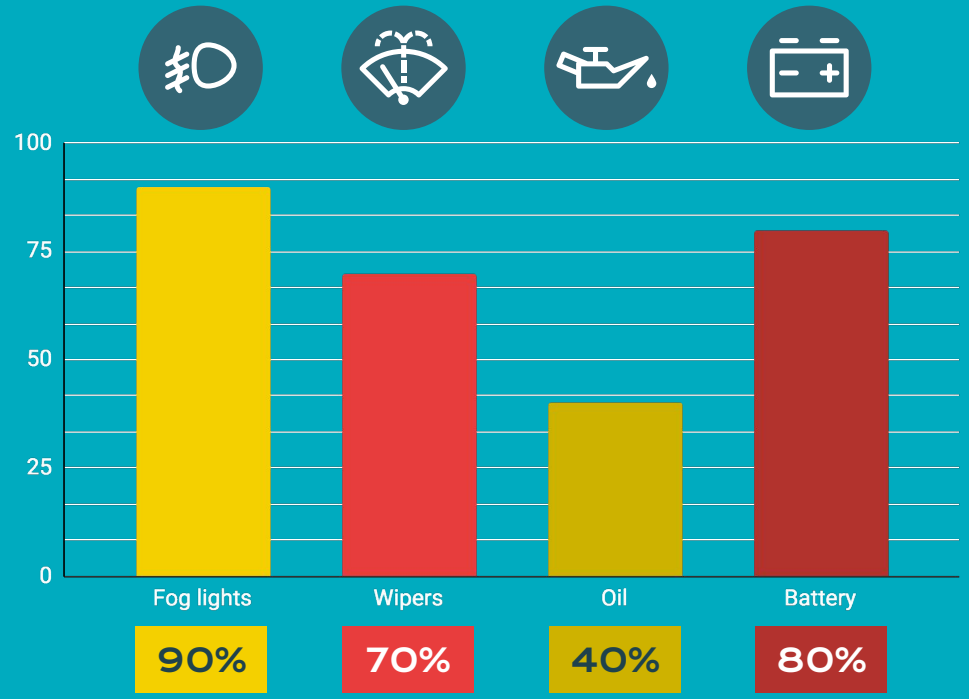


Driving center company profile infographics

CAR TUNING ESSENTIALS

Mercury is the closest planet to the Sun and the smallest one in the entire Solar System



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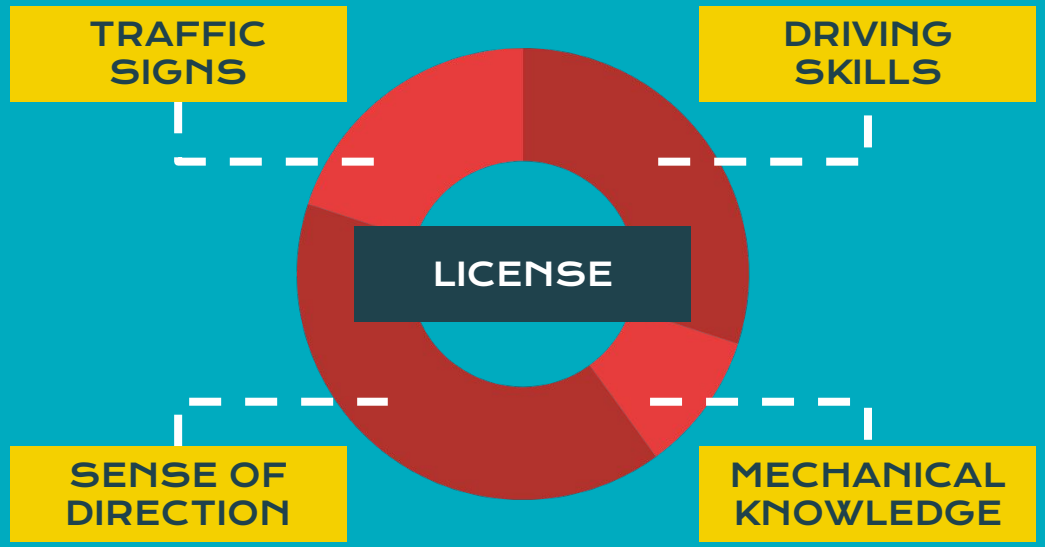
Driving center company profile infographics

Mercury is the closest planet to the Sun

Despite being red, Mars is a cold place



Jupiter is the biggest planet of them all

Earth is the third planet from the Sun

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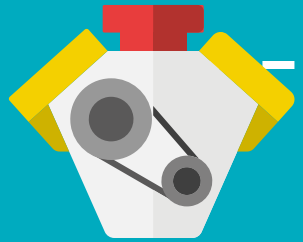


ENGINE PARTS

ENGINE BLOCK

Earth harbors life

CHAMBER

Mars is very cold

PISTON RING

Neptune is far away

VALVES

TIMING BELT

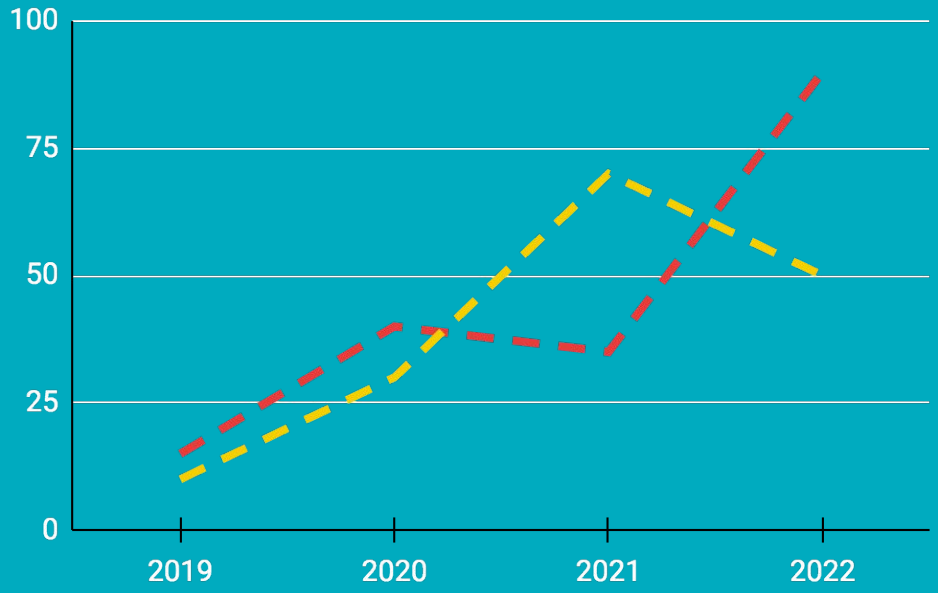
OIL PAN

SPARK PLUGS

PISTON

CYLINDER

Driving center company profile infographics



CAR LICENSES 80%

Jupiter is a gas giant and the biggest planet

TRUCK LICENSES 50%

Pluto is considered a dwarf planet

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Driving center company profile infographics

DRIVING LESSONS

Jupiter is the biggest planet of them all

THEORY

MARS

Despite being red, Mars is a cold place

MERCURY

Mercury is the closest planet to the Sun

PRACTICE

VENUS

Venus is the second planet from the Sun

SATURN

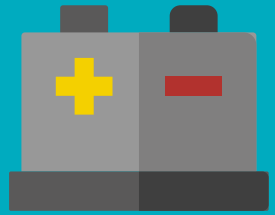
Saturn is a gas giant and has several rings

Driving center company profile infographics

01

CHARGING SYSTEM FUNCTIONING

Jupiter is a gas giant and the biggest planet in the Solar System



02

CHARGING SYSTEM PROBLEMS

Venus has a nice name and is the second planet from the Sun

Driving center company profile infographics

01

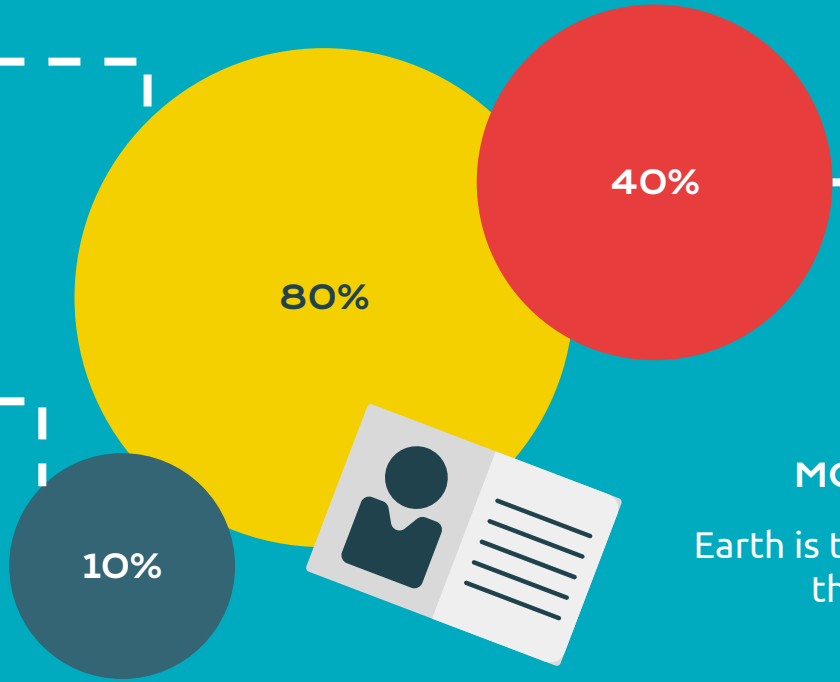
CAR

Jupiter is the biggest planet in the Solar System

02

TRUCK

Mercury is the closest planet to the Sun



03

MOTORCYCLE

Earth is the only planet that harbors life

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