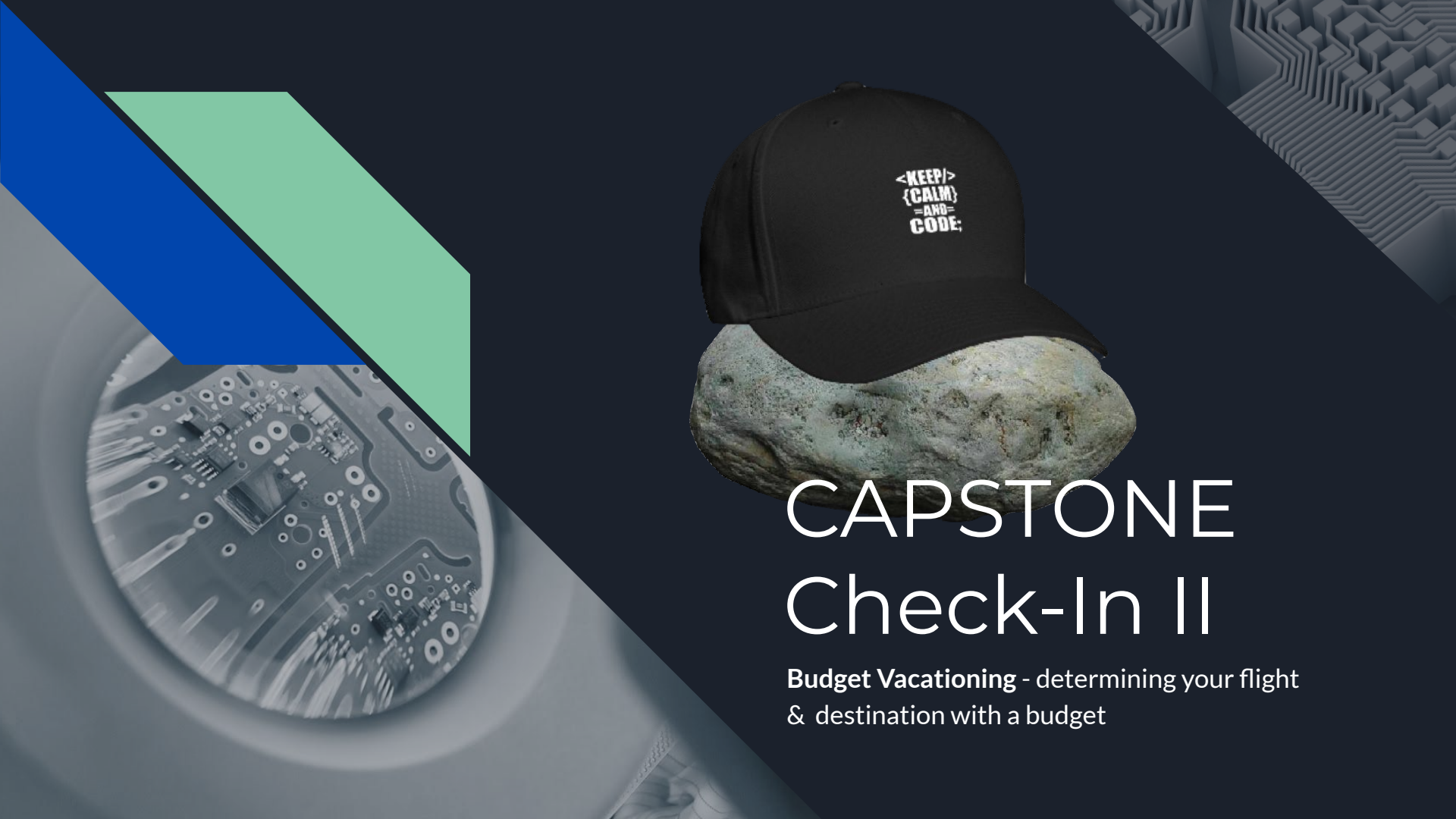

CAPSTONE Check-In II

Budget Vacationing - determining your flight & destination with a budget

TALKING POINTS

PROBLEM & GOAL

DATA & POTENTIAL FEATURES

METHODS / MODELS & EVALUATION

RISKS & ASSUMPTIONS

PROBLEM & GOAL

PREDICTING FUTURE PLANE PRICES BY MARKET/ROUTE & MONTH (USA)

Often we are limited by the scope of our mind to determine travel destinations. For instance, we pick a vacation destination we have knowledge about or a place our friends have visited, and then look into ways of executing that specific plan. We end up spending a significant amount of time fitting these plans to our budget.

But there are many other options. Wouldn't it be amazing to predict the highest value flights based on your specific budget and time window?

Our product aims to bring transparency into potential vacation destinations and offer an opportunity to identify a travel destination you may not have previously considered while adhering to your budget and time constraints.

DATA & POTENTIAL FEATURES

DATA

- Monthly Historical Jet Fuel Prices [Apr-1990 - Aug-2020]
- Monthly Top 100 Domestic Markets by Carrier [Jan-1990 - Aug-2019]
- Monthly US Domestic Flights [Jan-1990 - Dec-2009]
- Quarterly Top 1,000 Contiguous State City-Pair Markets [Q1-1996 - Q3-2019]

FEATURES

- # of flights
- # of passengers
- Average plane fare
- Routes / Markets
- Distance
- Airline
- Flight Type
  - freight, mail, passenger, hybrid
- Average plane fare
- Demand

METHODS / MODELS & EVALUATION

- METHODS / MODELS
  - Linear Time Series Modeling
  - Mutlivariate Time Series Modeling (VAR)
  - Seasonal / ARIMA Modeling
  - SGD Regression

- Evaluation
  - Predicting Future Airline Prices by Market / Month
    - Benchmark R2 - 20% increase over baseline model
    - Benchmark MSE, RMSE

RISKS & ASSUMPTIONS

- It may not work! As we learned yesterday time series data is very difficult and past performance does not dictate future behavior always
- Bias - Plane pricing fluctuates daily dependent on a number of factors, and each carrier has a different pricing model
- More Data

SMART

- Specific:
  - What precisely do you plan to do?
  - What type of model will you need to develop?
- Measurable:
  - What metrics will you be using to assess performance?
  - MSE? Accuracy? Precision? AUC?
- Achievable:
  - Is your project appropriately scoped?
  - Is it too aggressive? Too easy?
  - Note: If your project is too big, break it up into smaller pieces. Sometimes a good project is the simply one part of a larger, longer-term agenda.
- Relevant:
  - Does anyone care about this?
  - Why should people be interested in your results?
  - What value will the completion of your project be adding?
- Time-bound
  - What's your deadline?

- Specific:
  - Predict Future Airline Prices by Route
  - Regression
- Measurable:
  - Mean Squared Error
- Achievable:
  - Scoped Appropriately
  - Is it too aggressive? Too easy?
  - Note: If your project is too big, break it up into smaller pieces. Sometimes a good project is the simply one part of a larger, longer-term agenda.
- Relevant:
  - Does anyone care about this?
  - Why should people be interested in your results?
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