



TAKING CARE OF MODEL DEPLOYMENT

Presented by Ross Kippenbrock and Colin Ristig



ADDITIONAL RESOURCES

<https://github.com/rkipp1210/inspire-18-talk>

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About Ross



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About Colin

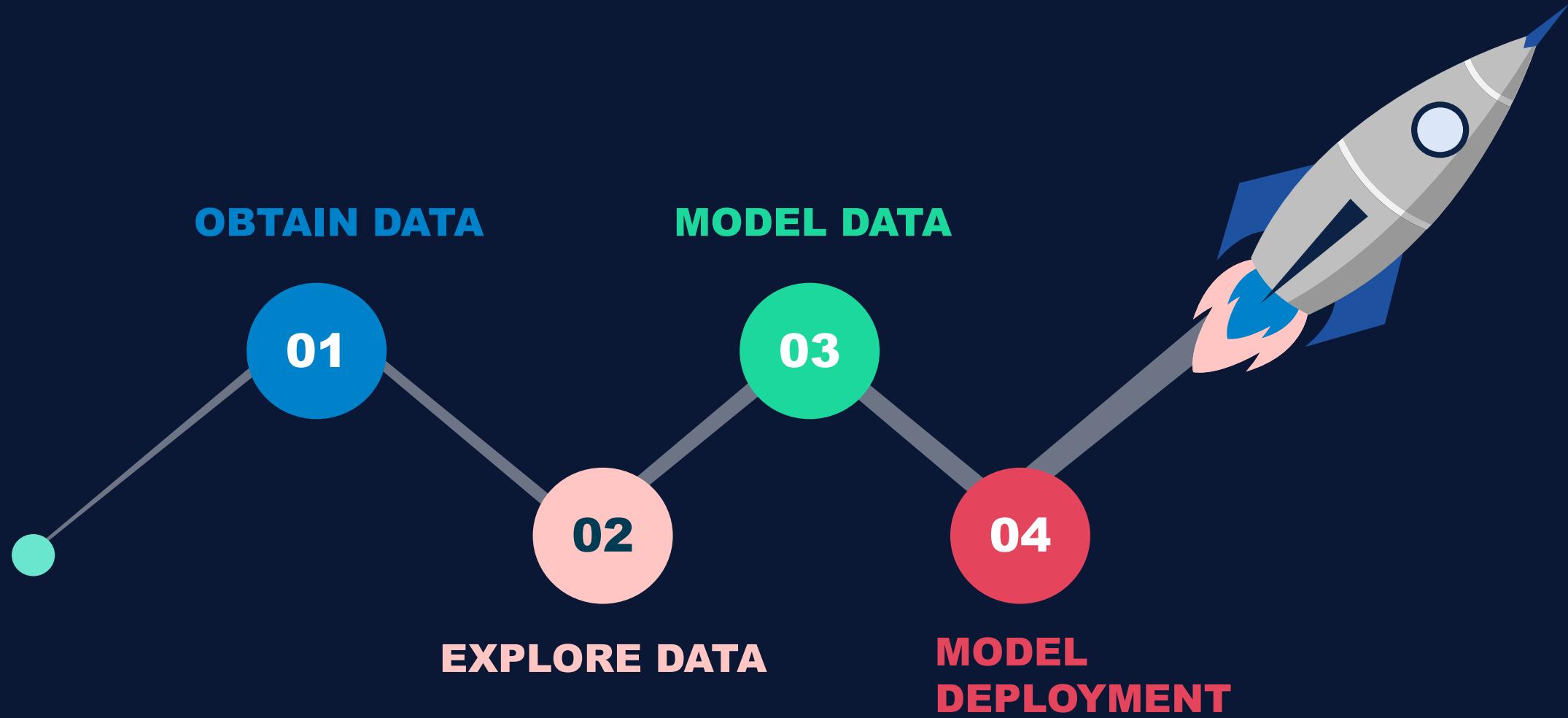


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AGENDA

- Pain and suffering in model deployment
- Promote eases heartache
- Case Study
 - NHL Shot Prediction Model

DATA SCIENCE LIFECYCLE



MODEL DEPLOYMENT



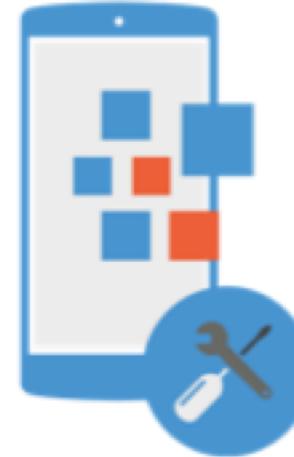
Reports



Interactive Dashboards



Real-time Applications



EXAMPLE APPS



Roll over image to zoom in

Customers Who Bought This Item Also Bought

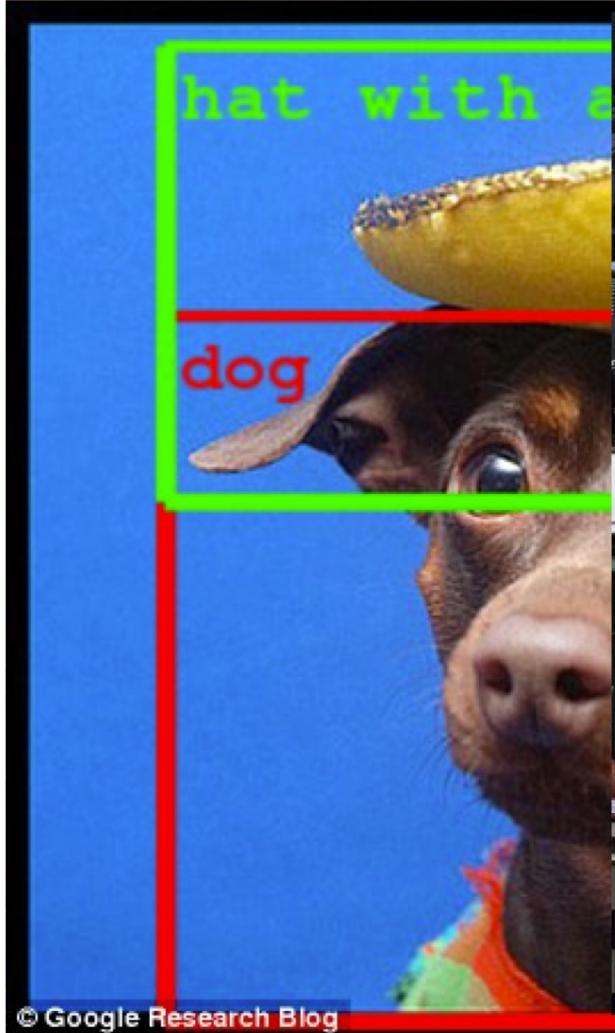
Galaxy S6 Case, Spigen [METALLIZED BUTTONS]
Neo Hybrid Series Case for Samsung Galaxy S6
★★★★★ 553
\$18.99 Prime

Spigen Galaxy S6 Case, Spigen [AIR CUSHION]
Slim Armor Case [KICK-STAND] for Samsung
★★★★★ 206
\$20.99 Prime

The screenshot shows a product page for a smartphone. A red arrow points from the top left towards a section titled "Customers Who Bought This Item Also Bought". This section displays two related products: a black case with metallic buttons and a hybrid case with a kickstand. Each item includes a star rating, number of reviews, and price.



EXAMPLE APPS





WHY IS THIS CHALLENGING?



MEET TREY, THE DATA SCIENTIST

Hi, I'm Trey.





MEET TREY'S BOSS, STEVE

We need to reduce churn.



Okay. I'll look into it.





THE “A HA” MOMENT ISN’T THE END

I figured out that....some complex stuff about vector space that'll improve...

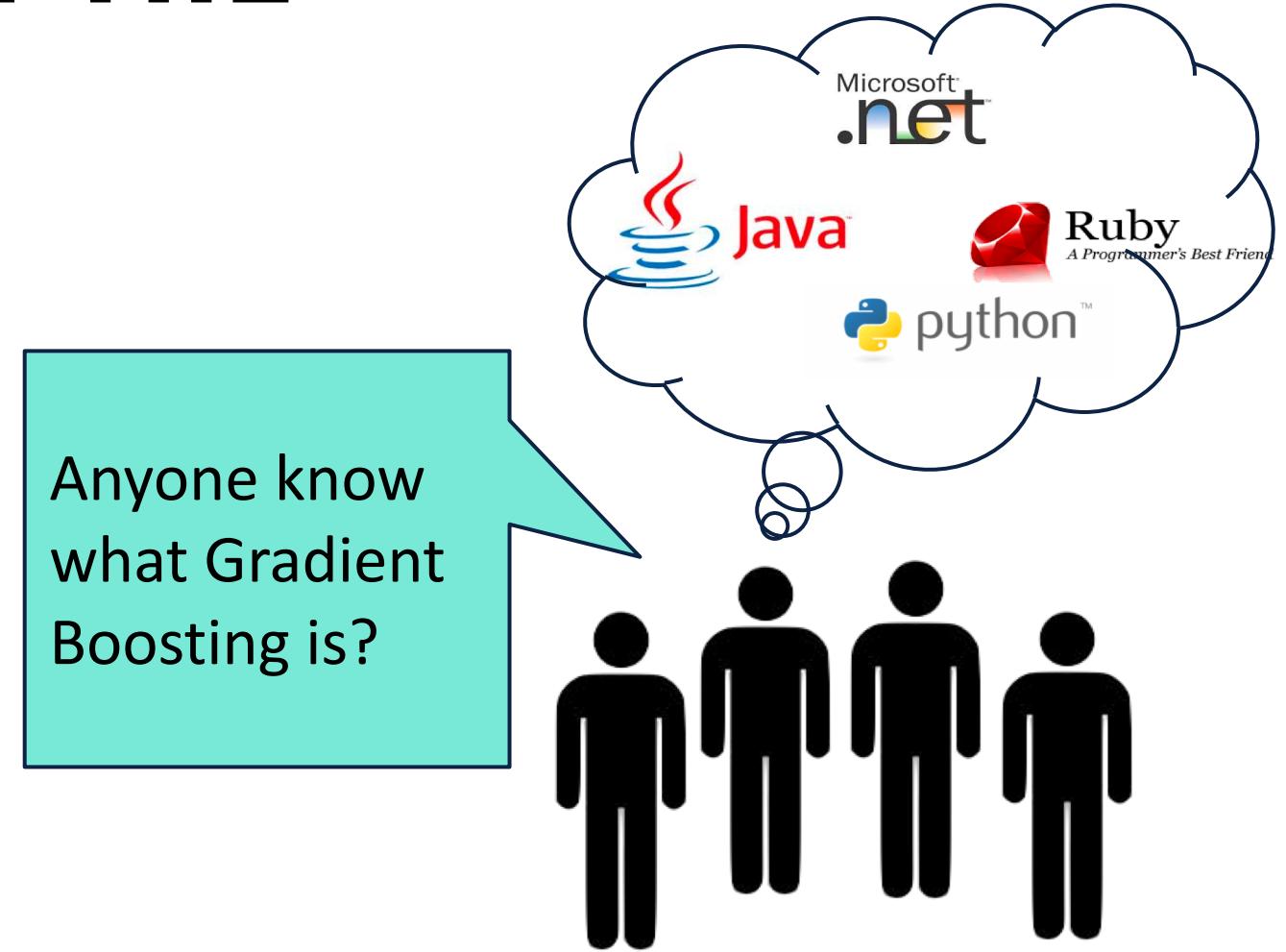
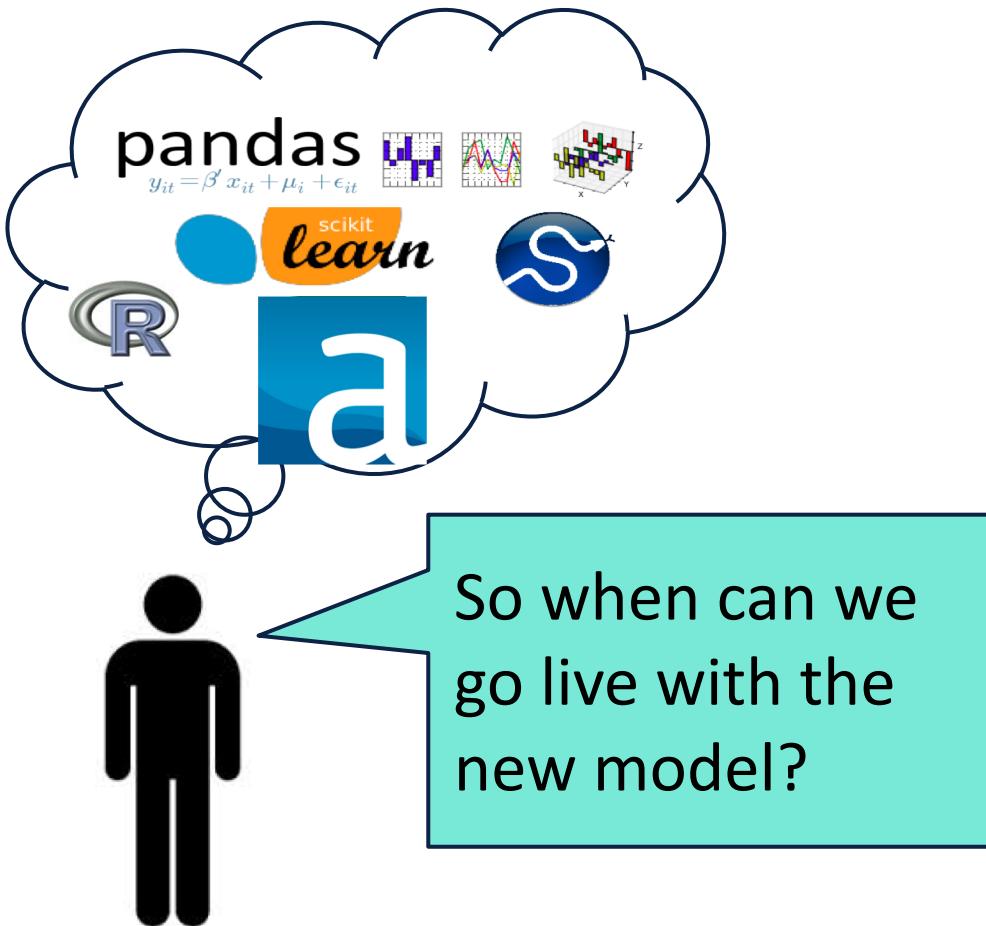
....and that's how we'll reduce churn.

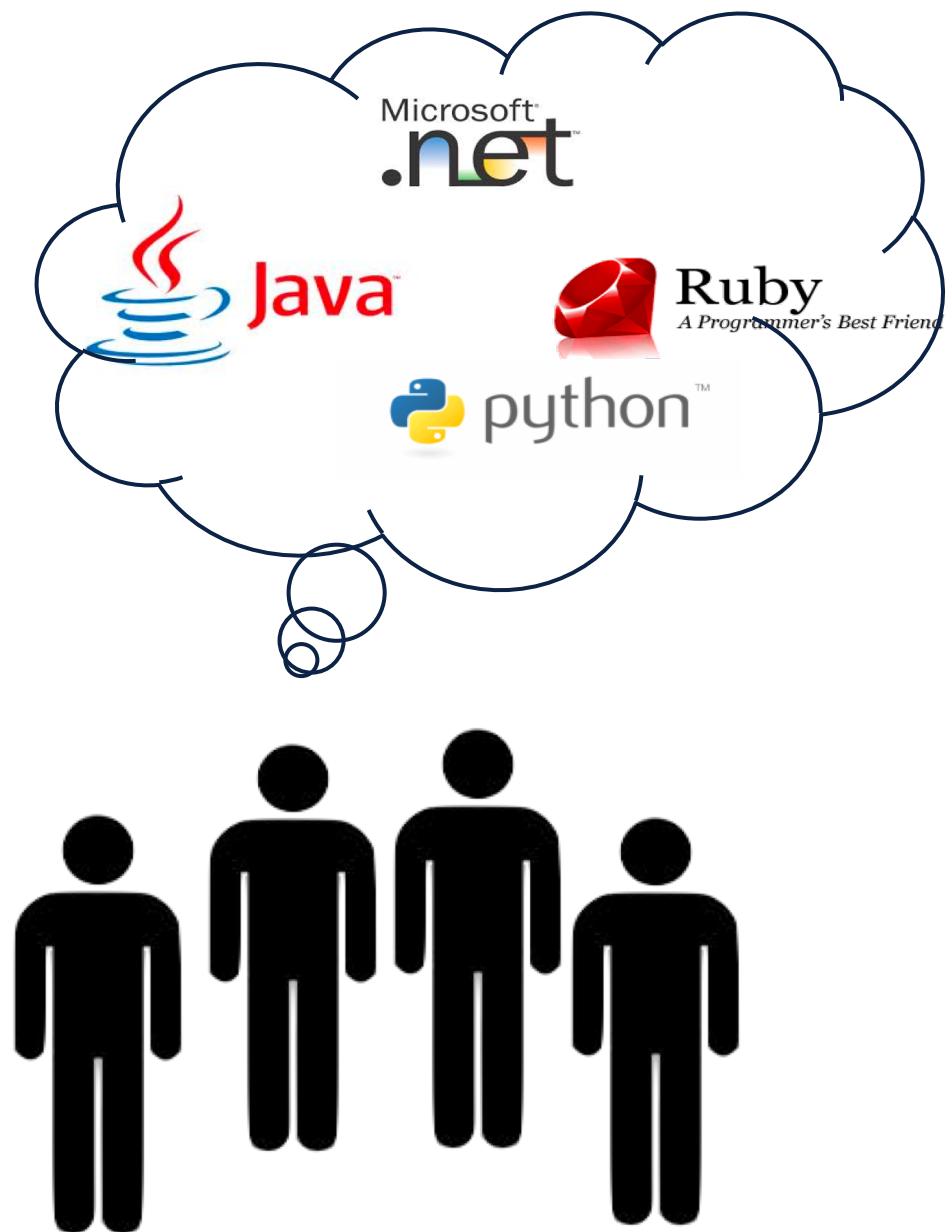
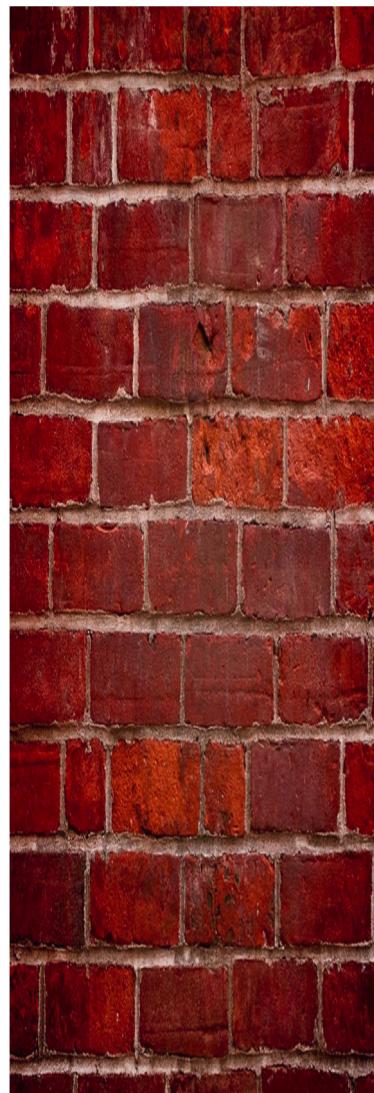


Sounds good. Let's do that...



TREY TALKS WITH THE ENGINEERS

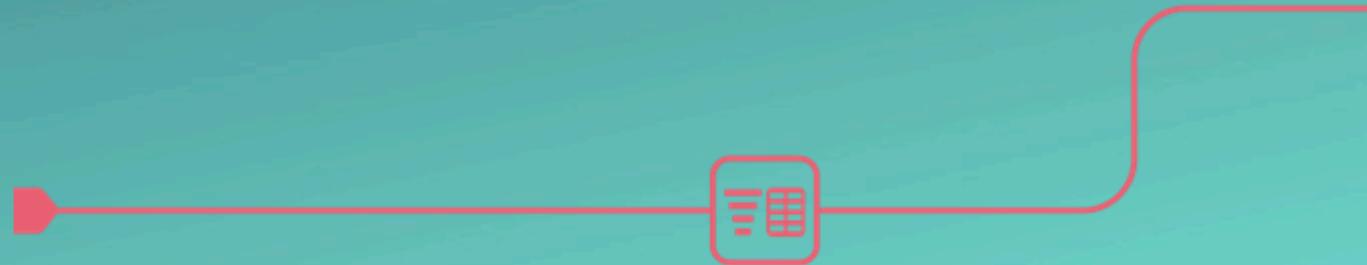


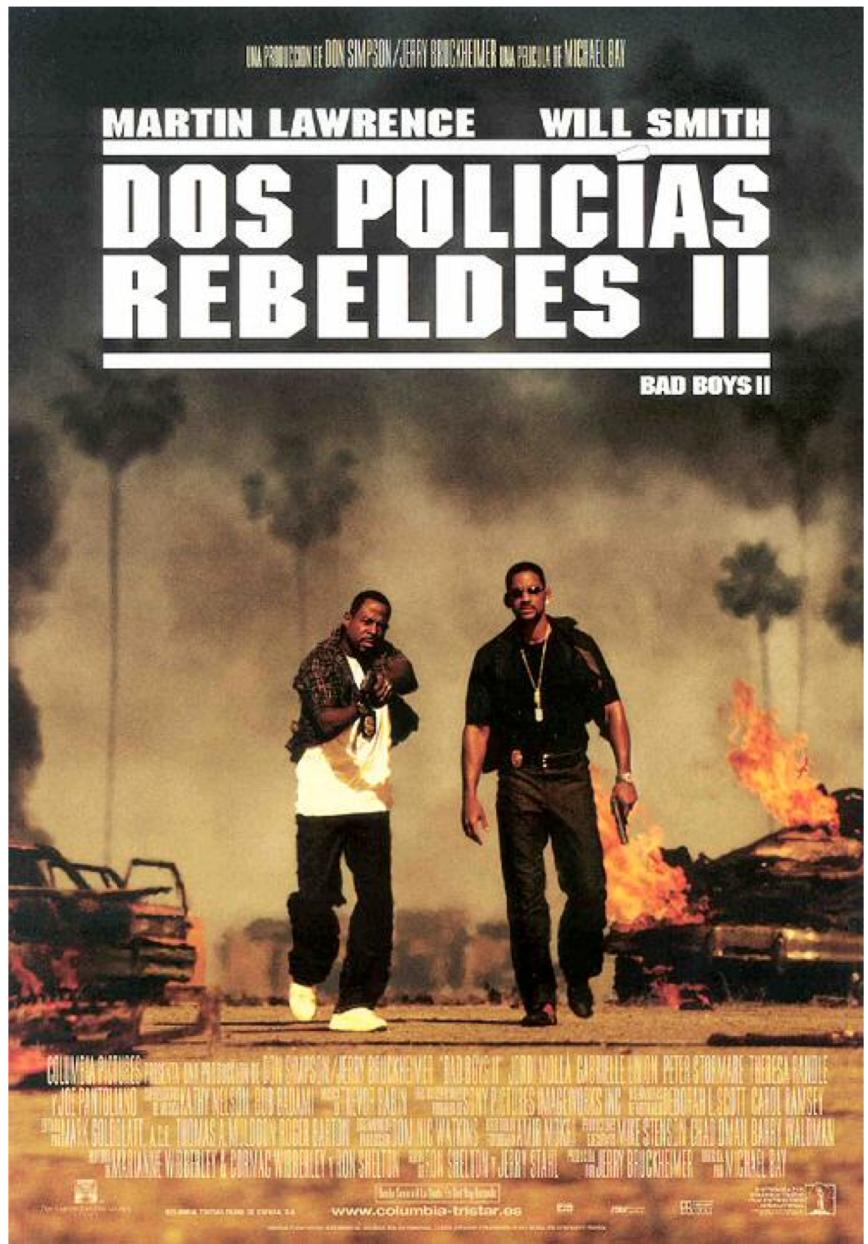




NOW WHAT?

1) TRANSLATE



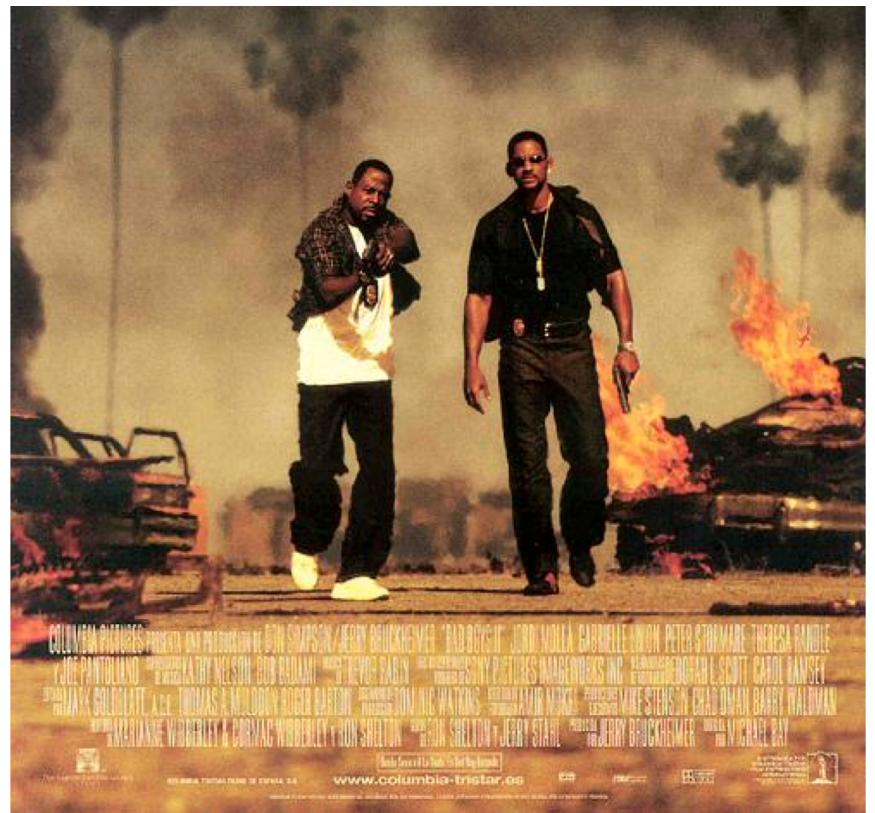


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2018
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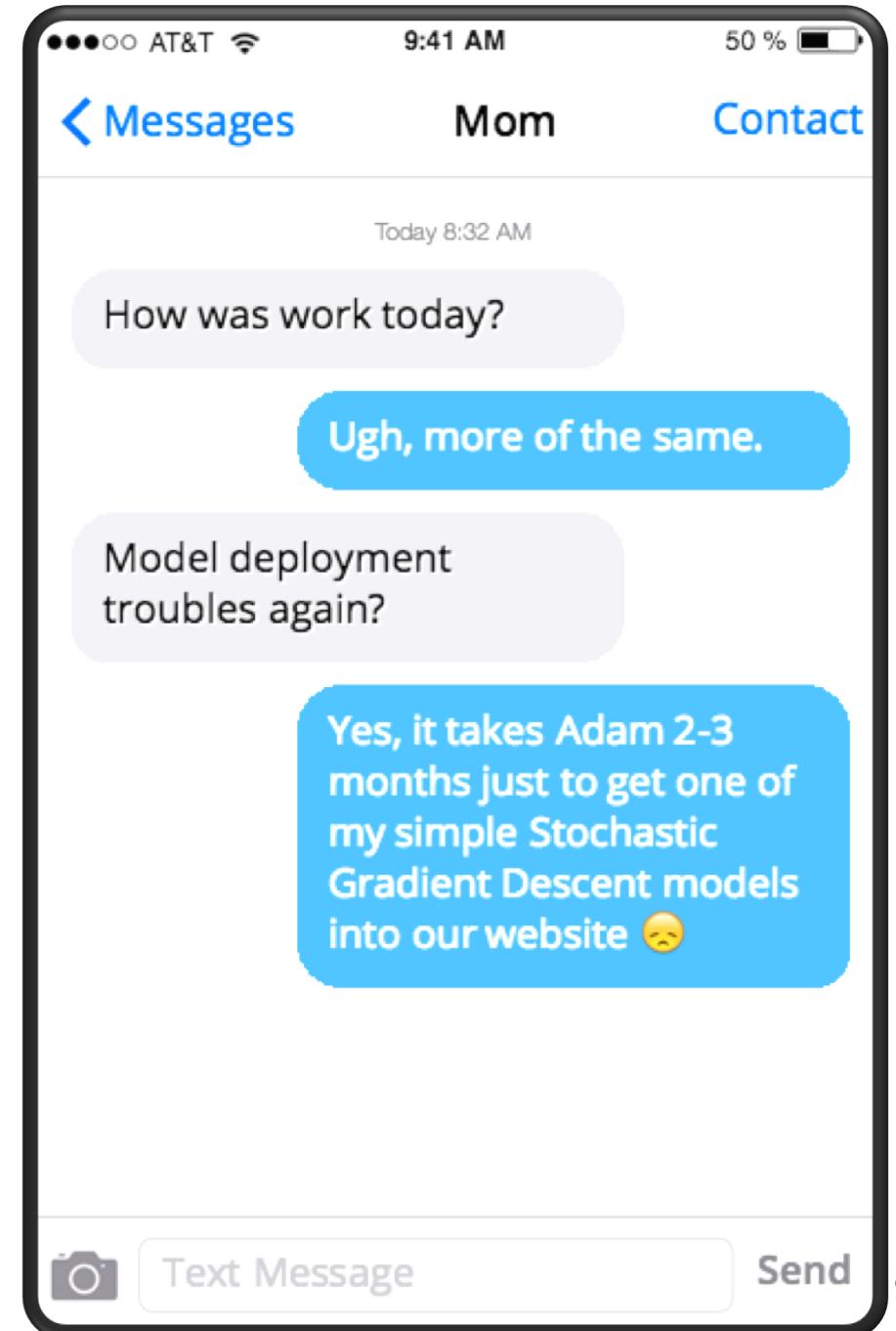
#ALTERYX18



2 REBEL POLICEMEN 2



DEPLOYMENTS CAN TAKE MONTHS



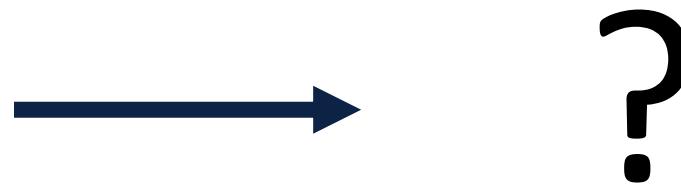
2) PMML



```
fit <- randomForest(Species ~ ., data=iris, ntree=20)
pmml(fit)

iris.pmml
  x
11/8   <SimplePredicate field="Petal.Width" operator="lessOrEqual" value="1.6"/>
1179  </Node>
1180  <Node id="9" score="virginica">
1181  <SimplePredicate field="Petal.Width" operator="greaterThan" value="1.6"/>
1182  </Node>
1183  </Node>
1184  </Node>
1185  <Node id="3">
1186  <SimplePredicate field="Sepal.Length" operator="greaterThan" value="5.45"/>
1187  <Node id="6">
1188  <SimplePredicate field="Petal.Width" operator="lessOrEqual" value="1.75"/>
1189  <Node id="10" score="setosa">
1190  <SimplePredicate field="Petal.Width" operator="lessOrEqual" value="0.65"/>
1191  </Node>
1192  <Node id="11">
1193  <SimplePredicate field="Petal.Width" operator="greaterThan" value="0.65"/>
1194  <Node id="12" score="versicolor">
1195  <SimplePredicate field="Petal.Length" operator="lessOrEqual" value="5.05"/>
1196  </Node>
1197  <Node id="13">
1198  <SimplePredicate field="Petal.Length" operator="greaterThan" value="5.05"/>
1199  <Node id="14" score="virginica">
1200  <SimplePredicate field="Petal.Width" operator="lessOrEqual" value="1.55"/>
1201  </Node>
1202  <Node id="15">
1203  <SimplePredicate field="Petal.Width" operator="greaterThan" value="1.55"/>
1204  <Node id="16" score="versicolor">
1205  <SimplePredicate field="Sepal.Length" operator="lessOrEqual" value="6.6"/>
1206  </Node>
1207  <Node id="17" score="virginica">
1208  <SimplePredicate field="Sepal.Length" operator="greaterThan" value="6.6"/>
1209  </Node>
1210  </Node>
1211  </Node>
1212  </Node>
1213  </Node>
1214  <Node id="7" score="virginica">
1215  <SimplePredicate field="Petal.Width" operator="greaterThan" value="1.75"/>
1216  </Node>
1217  </Node>
1218  </Node>
1219  </TreeModel>
1220  </Segment>
1221  </Segmentation>
1222  </MiningModel>
1223  </PMML>
```

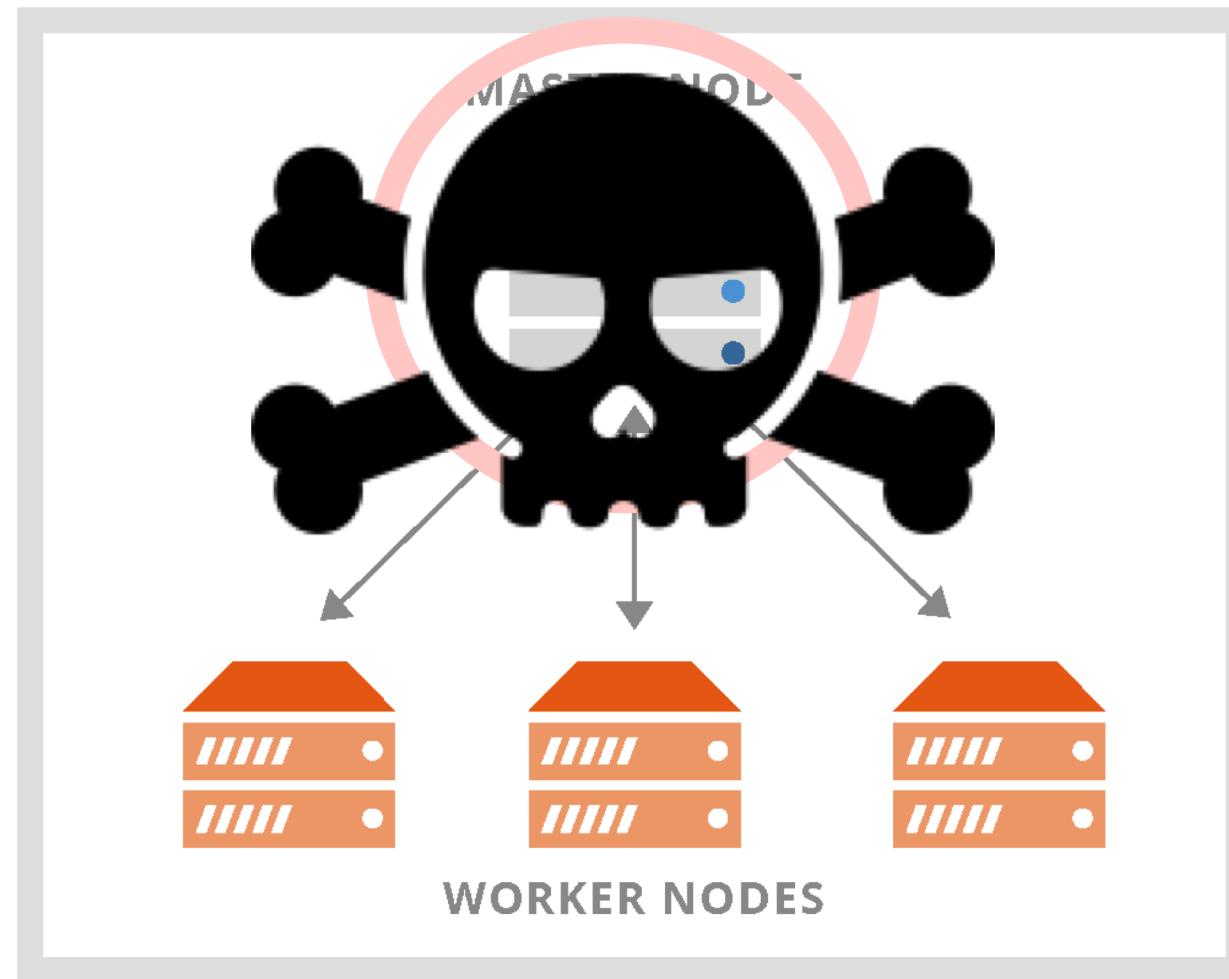
```
1 import re
2 import string
3
4 def remove_punc(s):
5     table = string.maketrans("", "")
6     s = s.translate(table, string.punctuation)
7     return s
8
9 def clean_data(x):
10    clean_x = remove_punc(x)
11    clean_x = re.sub("(Mr|Mrs|Ms|Dr)", clean_x, "")
12    return { "original_name": x, "clean_name": clean_x }
```



3) ROLL YOUR OWN



BUILDING FOR HIGH AVAILABILITY IS HARD

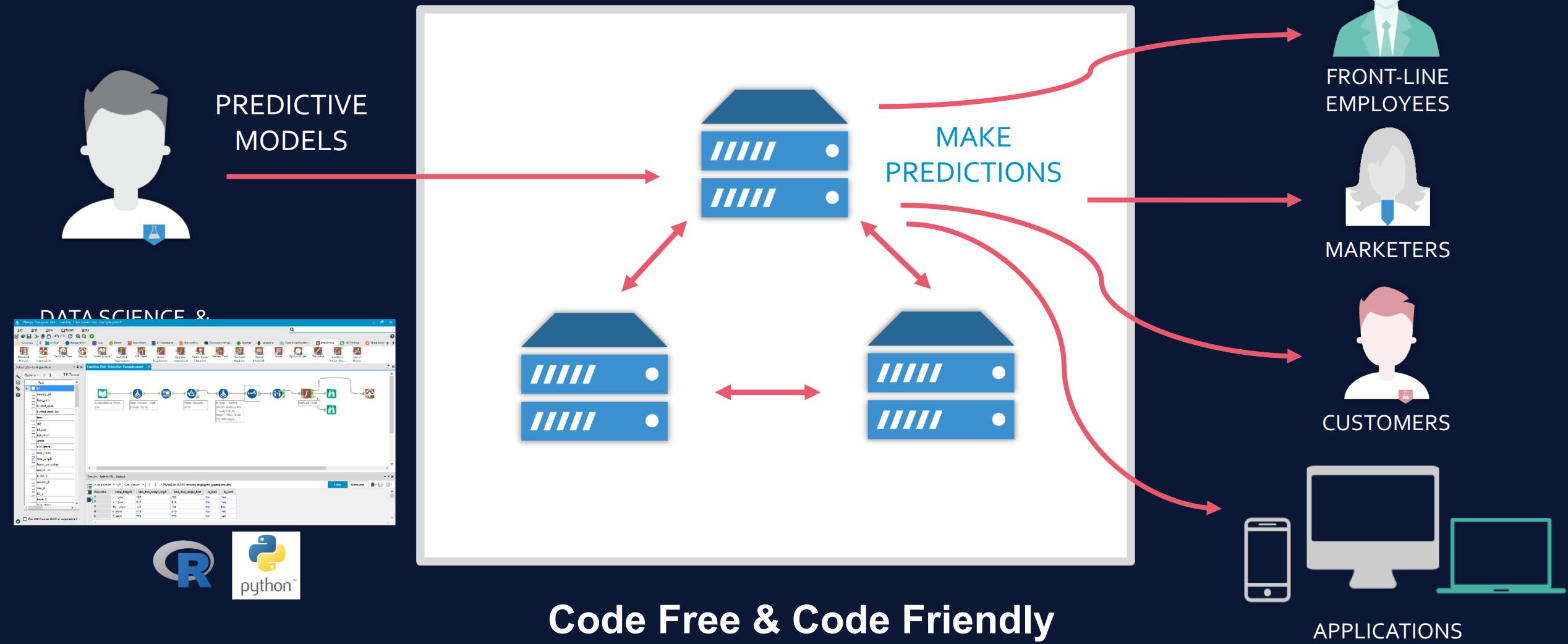




THIS IS WHY WE
BUILT PROMOTE

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PROMOTE AT THE CORE

API-invoked function execution

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DEPLOY PREDICTIVE MODELS



50
51
52

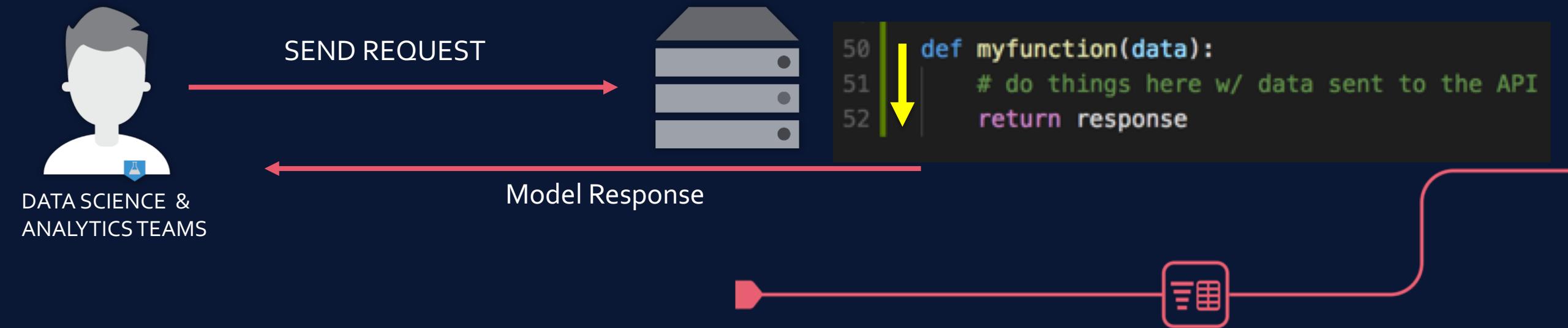
```
def myfunction(data):  
    # do things here w/ data sent to the API  
    return response
```



PROMOTE AT THE CORE

API-invoked function execution

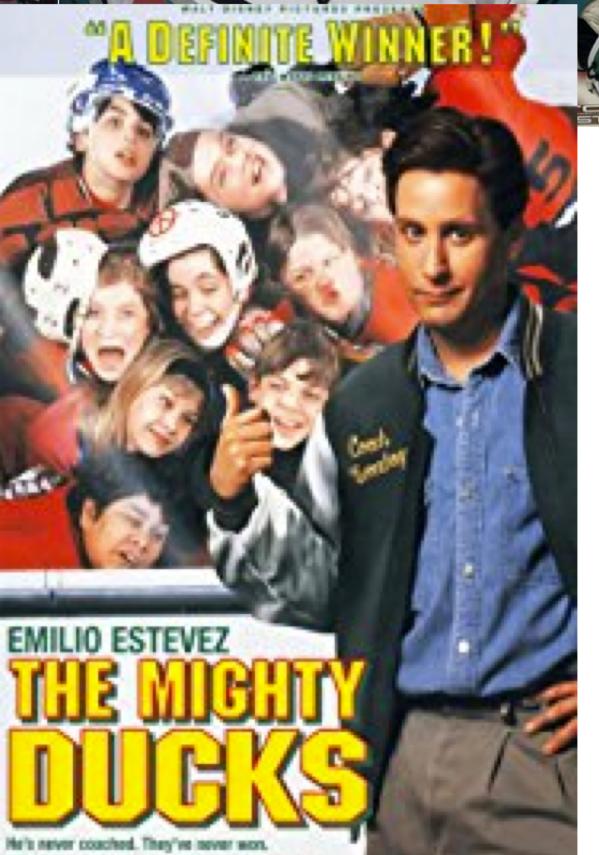
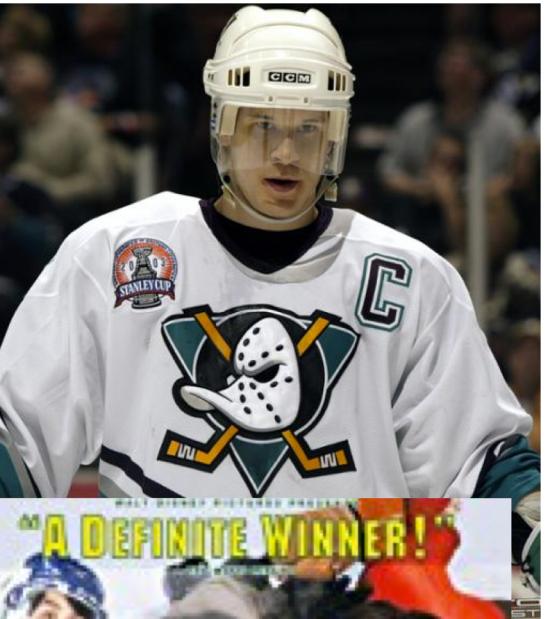
alteryx | PROMOTE





CASE STUDY

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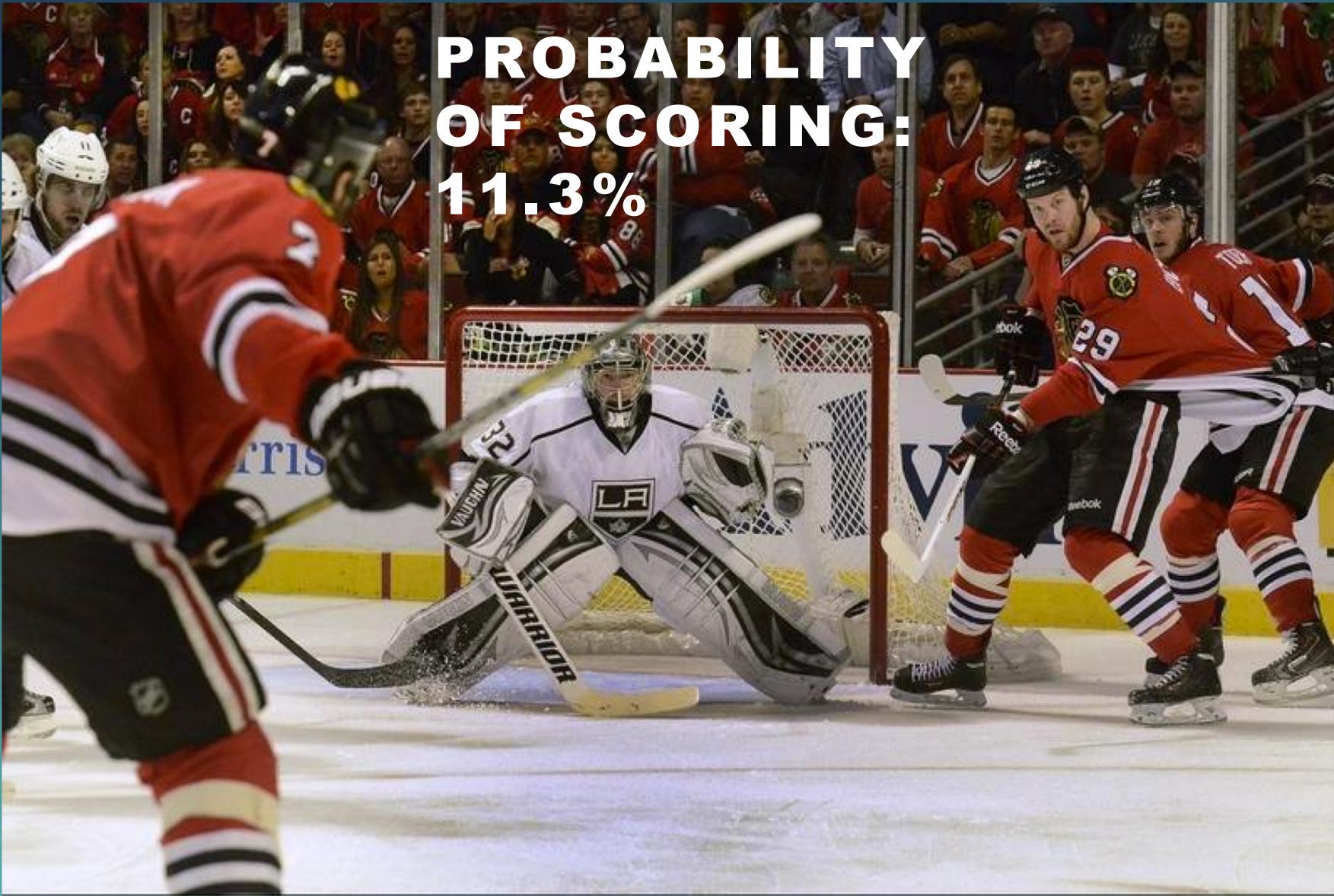


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#ALTERIX18



PROBABILITY
OF SCORING:
11.3%



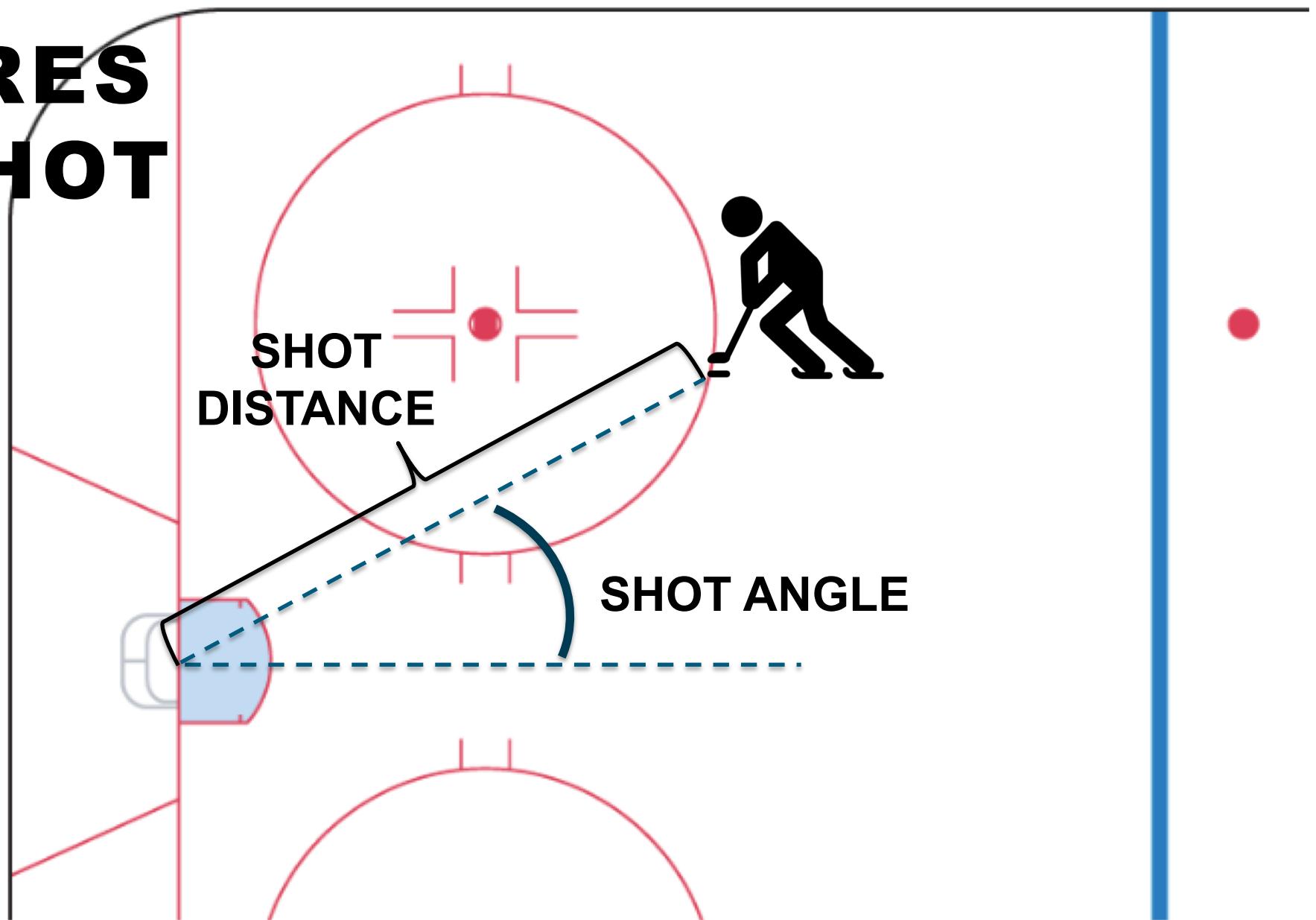
THE DATA



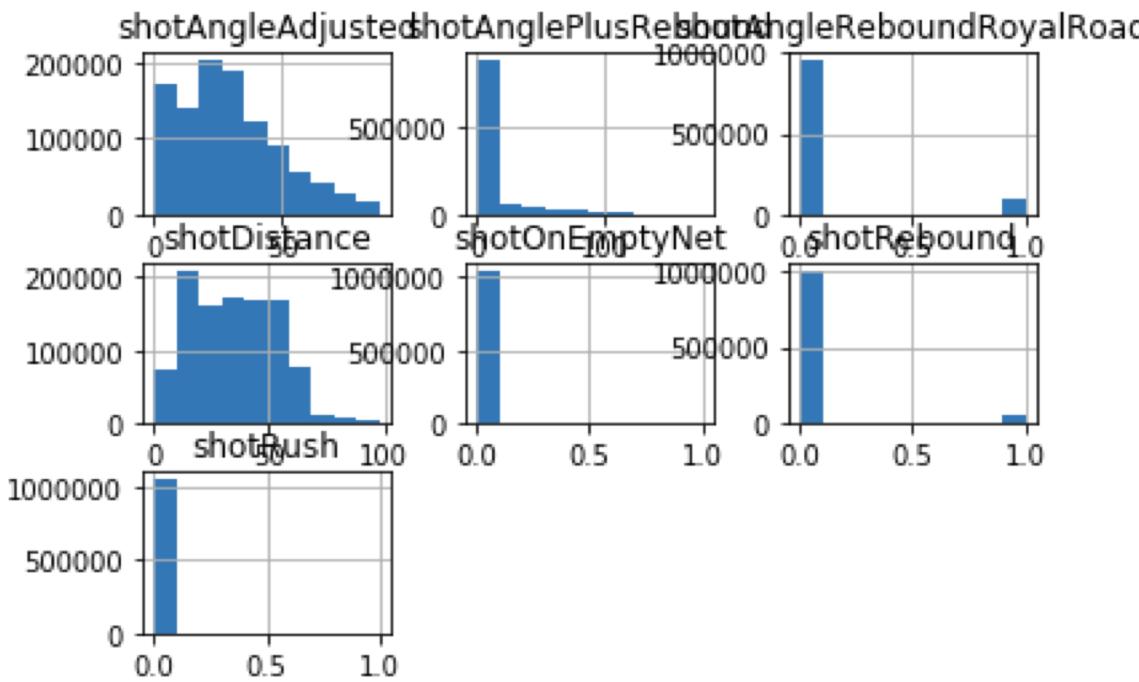
homeTeamCode awayTeamCode game_id time period team teamCode location xCordAdjusted xCordAdjusted shotType shotOnEmptyNet

1046503	MTL	NYR	30111	16	1	HOME	MTL	Neu. Zone	8	8	WRIST	0
1046504	MTL	NYR	30111	87	1	AWAY	NYR	HOMEZONE	60	60	WRIST	0
1046505	MTL	NYR	30111	116	1	AWAY	NYR	HOMEZONE	85	85	WRIST	0
1046506	MTL	NYR	30111	124	1	HOME	MTL	AWAYZONE	69	69	WRIST	0
1046507	MTL	NYR	30111	220	1	HOME	MTL	AWAYZONE	55	55	SLAP	0

FEATURES OF A SHOT



ZE MODEL



EMPTY NET SHOTS

0 1049845

1 4282

Name: shotOnEmptyNet, dtype: int64

RUSH SHOTS

0 1051983

1 2144

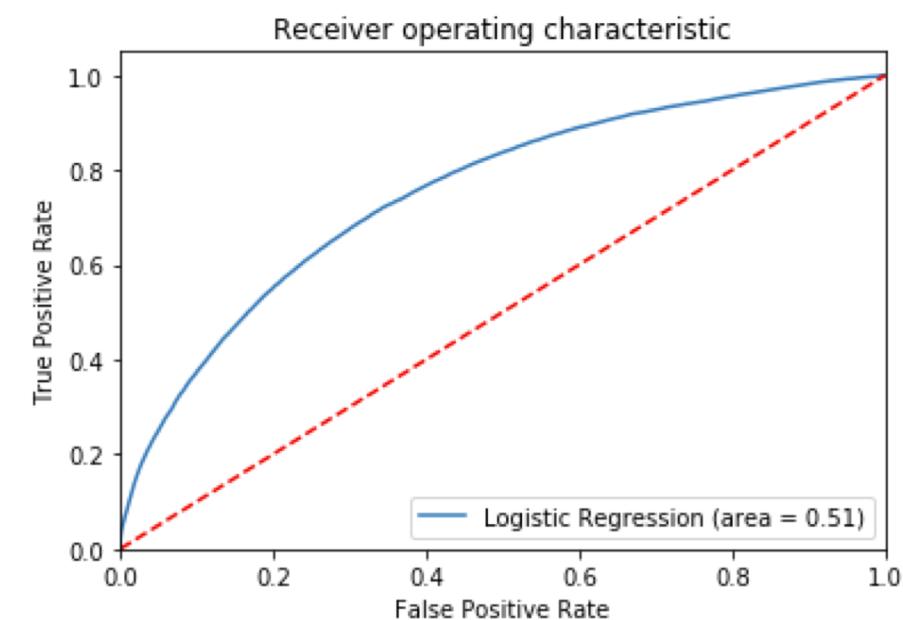
Name: shotRush, dtype: int64

REBOUND SHOTS

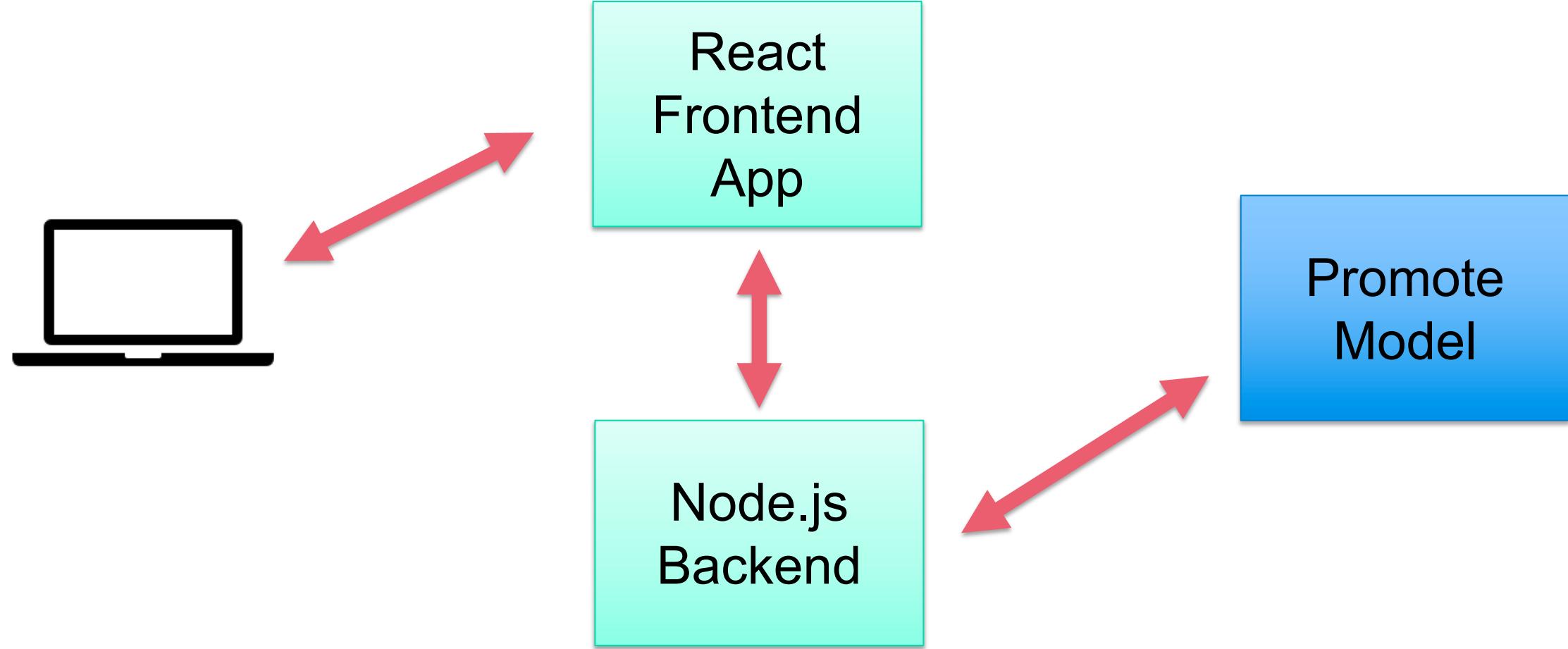
0 1000571

1 53556

Name: shotRebound, dtype: int64



STRUCTURE OF THE APPLICATION





THANK
YOU