



Machine Learning for Designers

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lpk.com





FAST
COMPANY

D | A | A | P





NEW NAVY DEVICE LEARNS BY DOING

Psychologist Shows Embryo
of Computer Designed to
Read and Grow Wiser



Read and Grow Wiser

WASHINGTON, July 7 (UPI)—The Navy revealed the embryo of an electronic computer today that it expects will be able to walk, talk, see, write, reproduce itself and be conscious of its existence.

The embryo—the Weather Bureau's \$2,000,000 "704" computer—learned to differentiate between right and left after fifty attempts in the Navy's

WHAT IS MACHINE LEARNING?

WHAT IS MACHINE LEARNING?

“improving performance in some task with experience”

-Tom Mitchell, author of *Machine Learning*

WHAT IS MACHINE LEARNING?

“it is a method of teaching computers to make and improve predictions or behaviors based on some data.”

-Daniel G, guy on Stack Overflow

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WHAT IS MACHINE LEARNING?

What's different?

WHAT IS MACHINE LEARNING?

What's different?

traditional code:

Explicit

(instructions)

What's different?

traditional code:

Explicit

(instructions)

machine learning:

Implicit

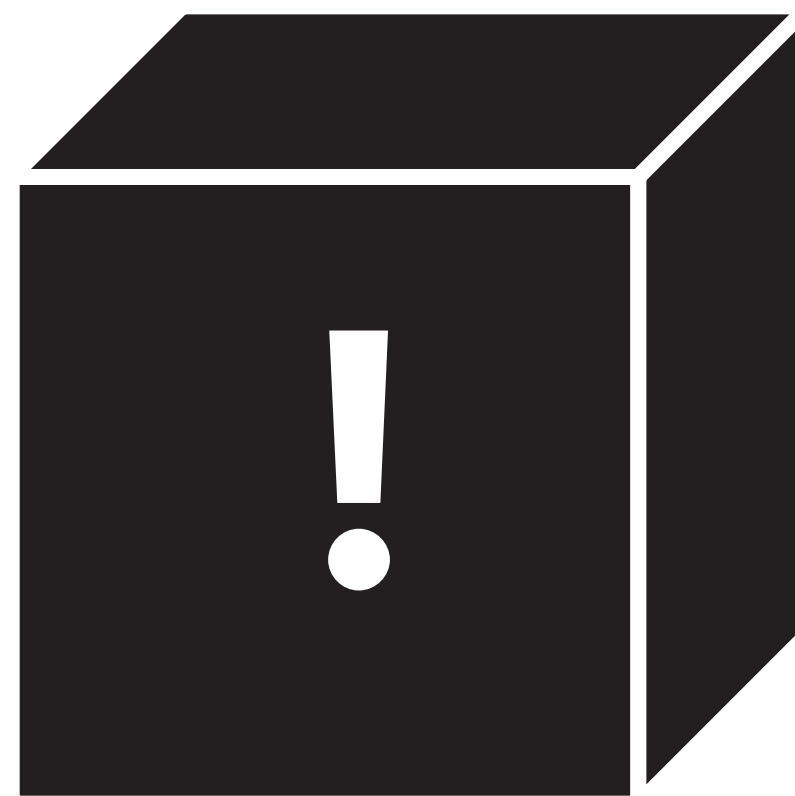
(train with data)

WHAT IS MACHINE LEARNING?

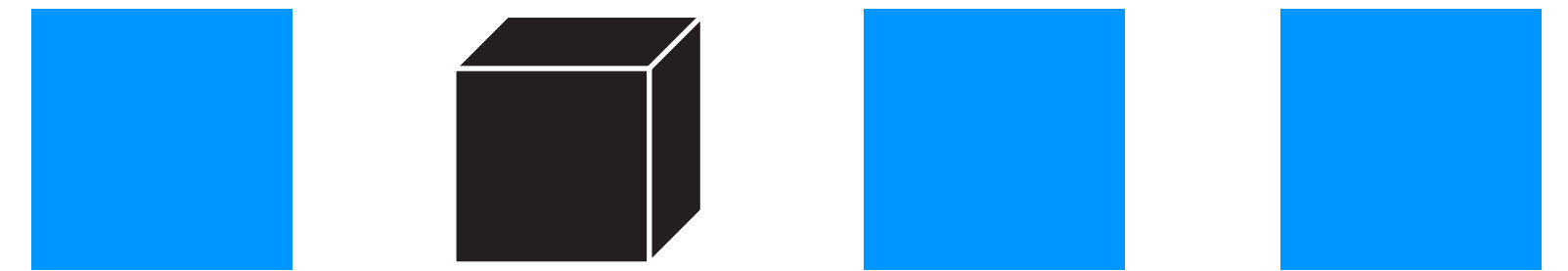
Software that is written by showing it data.
Then it makes predictions.



Our Data



Model



Small part of software

WHAT IS MACHINE LEARNING?

Classification

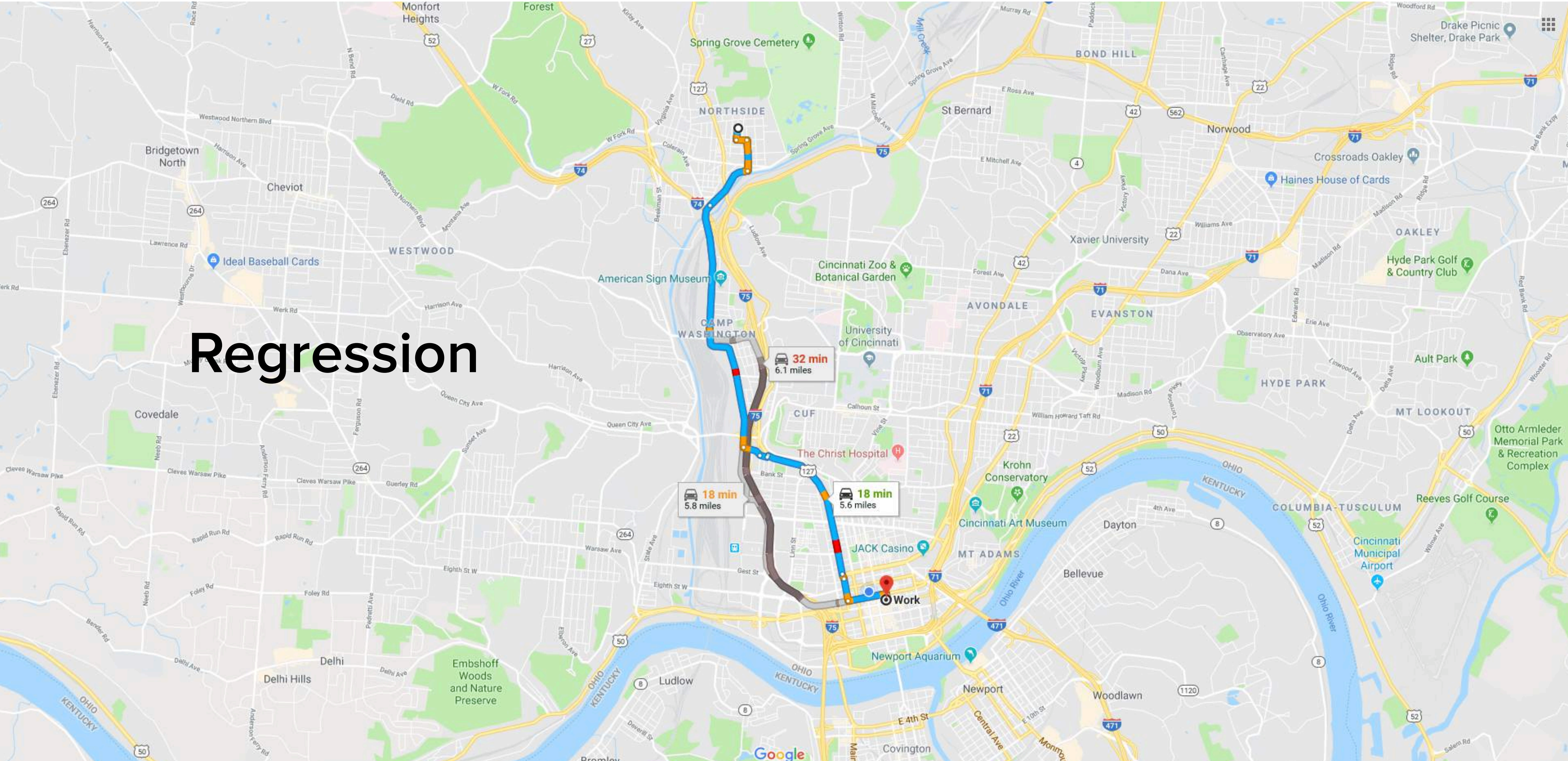


airplane.png



WHAT IS MACHINE LEARNING?

Regression



WHAT IS MACHINE LEARNING?

Clustering

Sponsored products related to this item (What's this?)



Thermos Food Jar For Hot Food and Soup. Wide Mouth Lunch Container For Kids/Adults...
★★★★☆ 20
\$23.94 ✓prime



Thermos Stainless King 16 Ounce Food Jar with Folding Spoon, Stainless Steel
★★★★☆ 4005
\$24.99 ✓prime



Thermos Stainless King 24 Ounce Food Jar, Midnight Blue
★★★★☆ 2099
\$20.19 ✓prime



MIRA Lunch, Food Jar, Vacuum Insulated Stainless Steel Lunch Thermos, 13.5 Oz, Rose...
★★★★☆ 462
\$15.50 ✓prime



Thermos 16 Ounce Stainless Steel Food Jar, Black
★★★★☆ 411
\$21.67 ✓prime



MIRA 17 Oz Stainless Steel Vacuum Insulated Water Bottle | Thermos Keeps Drink Cold...
★★★★☆ 331
\$16.95 ✓prime



Shot Flask - Stainless Steel 8 oz Hip Flask, Built-in Collapsible 2 Oz. Shot Glass ...
★★★★☆ 285
\$19.95 ✓prime



Simple Modern 20oz Ascent Water Bottle - Stainless Steel Hydro Swell Flask w/Handle...
★★★★☆ 847
\$17.99 ✓prime



Shappy 10 Pieces Drinks Flasks Liquor Pouch Reusable Drinking Flasks Concealable Pl...
★★★★☆ 31
\$9.99 ✓prime



uKeg 64 Pressurized Growler for Craft Beer - Copper
★★★★☆ 626
\$169.00 ✓prime

Customers who bought this item also bought



Wide Mouth 12 oz Kids Vacuum Insulated Stainless Steel Sippy Cup Water Bottle with BPA...
★★★★☆ 73
\$29.95 ✓prime



Hydro Flask 10 oz Double Wall Vacuum Insulated Stainless Steel Whiskey Rocks Glass with BPA...
★★★★☆ 426
\$29.95 ✓prime



Hydro Flask Double Wall Vacuum Insulated Stainless Steel Water Bottle/Travel Coffee...
★★★★☆ 5,581
#1 Best Seller in Sports Fan Travel Mugs
\$24.95 ✓prime



Hydro Flask 40 oz Double Wall Vacuum Insulated Stainless Steel Leak Proof Sports Water Bottle, ...
★★★★☆ 5,177
#1 Best Seller in Sports Accessories
\$42.95 ✓prime



Hydro Flask Double Wall Vacuum Insulated Stainless Steel Leak Proof Sports Water Bottle, ...
★★★★☆ 1,736
\$29.95 ✓prime



Hydro Flask Protective Soft Silicone Water Bottle Flex Boot
★★★★☆ 75
\$11.95 ✓prime



Hydro Flask 10 oz Double Wall Vacuum Insulated Stainless Steel Whiskey Rocks Glass with BPA...
★★★★☆ 426
\$22.50 ✓prime



Upper Order Durable Insulated Lunch Box Tote Reusable Cooler Bag 25% Larger Greater Storage
★★★★☆ 232
\$15.95 ✓prime



GoPicnic Ready-To-Eat Meals Kid-Friendly Variety Pack, 6 Count
★★★★☆ 44
\$36.26 ✓prime



Hydro Flask Wide Mouth BPA Free Insulated Sports Water Bottle Straw Lid for Sipping (Not Leak Proof)
★★★★☆ 1,102
#1 Best Seller in Water Bottle Accessories
5 offers from \$10.95

WHAT IS MACHINE LEARNING?

The image shows a screenshot of an email client interface. On the left, a sidebar contains a list of email items: "Super important stuff", "Jane Smith (foo.com)", "Super important stuff", and "Please see attached". The main area is mostly blank, with a "Send" button and a toolbar at the bottom. The toolbar includes icons for text formatting (underline), attachments, currency, images, links, and emojis. A modal dialog box is centered on the screen, displaying a message from "mail.google.com" that says: "It seems like you forgot to attach a file. You wrote 'see attached' in your message, but there are no files attached. Send anyway?". The dialog has "Cancel" and "OK" buttons.

mail.google.com says:

It seems like you forgot to attach a file.

You wrote "see attached" in your message, but there are no files attached.
Send anyway?

Cancel OK

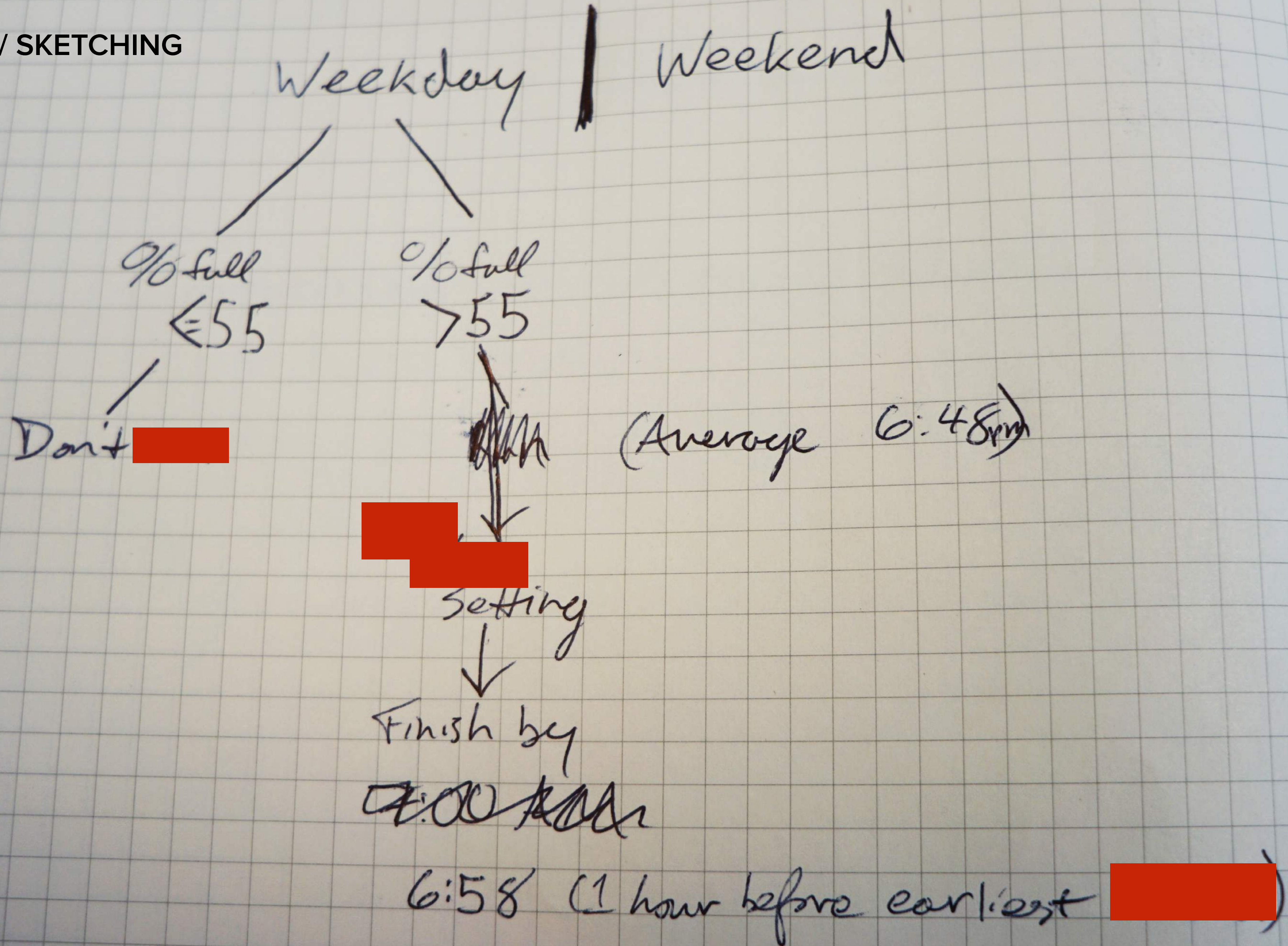
Send

A | 📎 🏠 \$ 🖼️ 🔗 😊

🗑️ | ▾

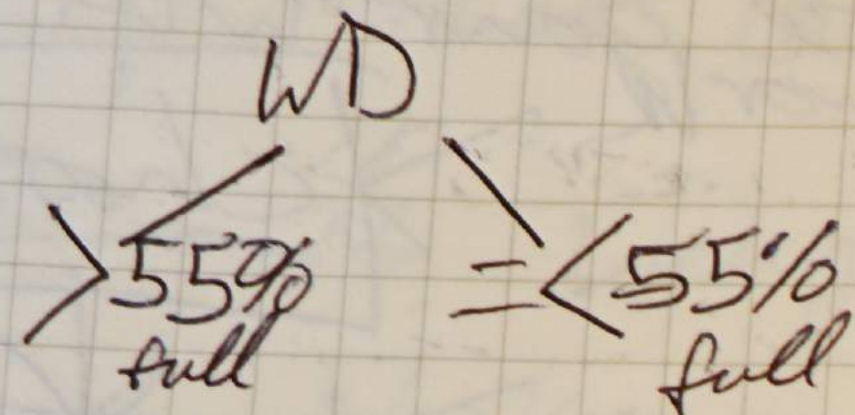
PROCESS / SKETCHING

PROCESS / SKETCHING

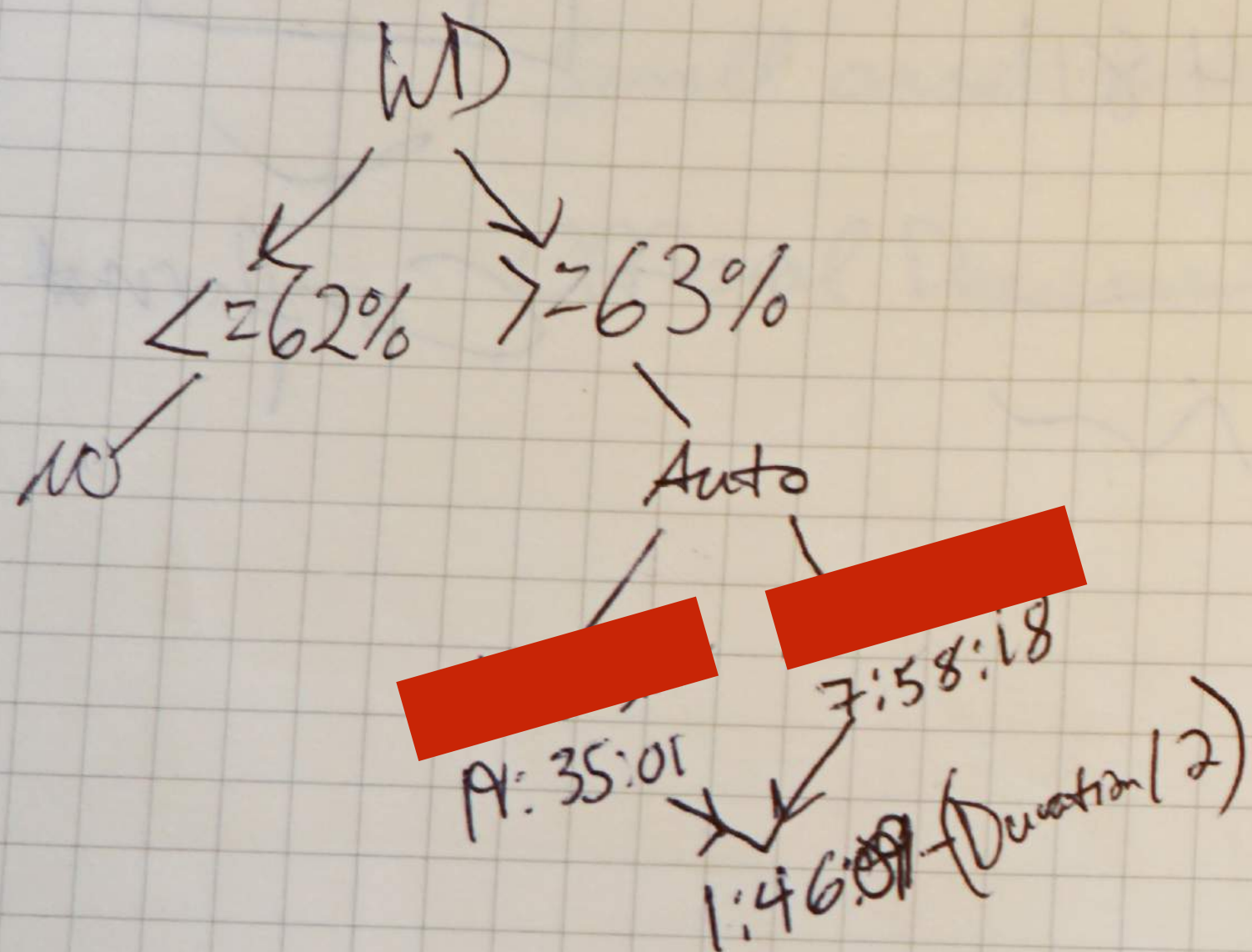


Decision Tree Sketch

PROCESS / SKETCHING



55 = high
70 = low
62.5%



Latest Start to
Earliest

19:35:01 → 7:58:18
4:25 | 7:58



~~12:22:19~~
6:11:085

+ 19:35:01

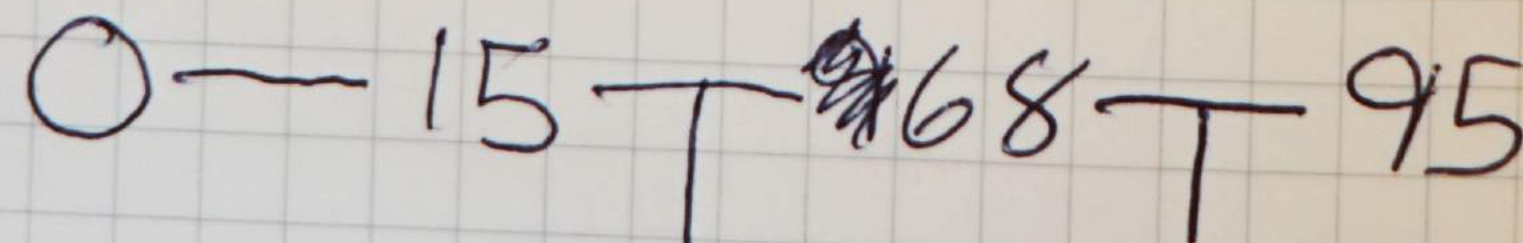
1:40:9.5

Does this work?
~~CO~~

Latest Sta

WE

→ >81.5



MICRO EXERCISE 1: PSEUDOCODING

MICRO EXERCISE 1: PSEUDOCODING

- Describe step-by-step how to brush your teeth on the left side of the page.

5 minutes

PSEUDOCODE

WHAT Brush your teeth

1 Pick up your tooth brush

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

WHAT _____

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

MICRO EXERCISE 1: PSEUDOCODING

- Describe step-by-step how to recognize a human face.

5 more minutes

PSEUDOCODE

WHAT Brush your teeth

1 Pick up your tooth brush

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

WHAT Recognize a face

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____


10 _____

MACHINE LEARNING AS DESIGN MATERIAL

MACHINE LEARNING AS DESIGN MATERIAL



1



Face ID
Unknown

Demographics
Gender: Unknown
Age: Unknown
Ethnicity: Unknown

Individual Emotional Profile

99.60 %

- Happiness
- Surprise
- Sadness
- Disgust
- Fear
- Anger
- Neutral

Head Pose

Roll: -3
Yaw: 0
Pitch: 28

MACHINE LEARNING AS DESIGN MATERIAL

Object and Scene Detection

Rekognition identifies thousands of objects such as vehicles, pets, or furniture, and provides a confidence score. Rekognition also detects scenes within an image, such as a sunset or beach. This makes it easy for you to add features that search, filter, and curate large image libraries.

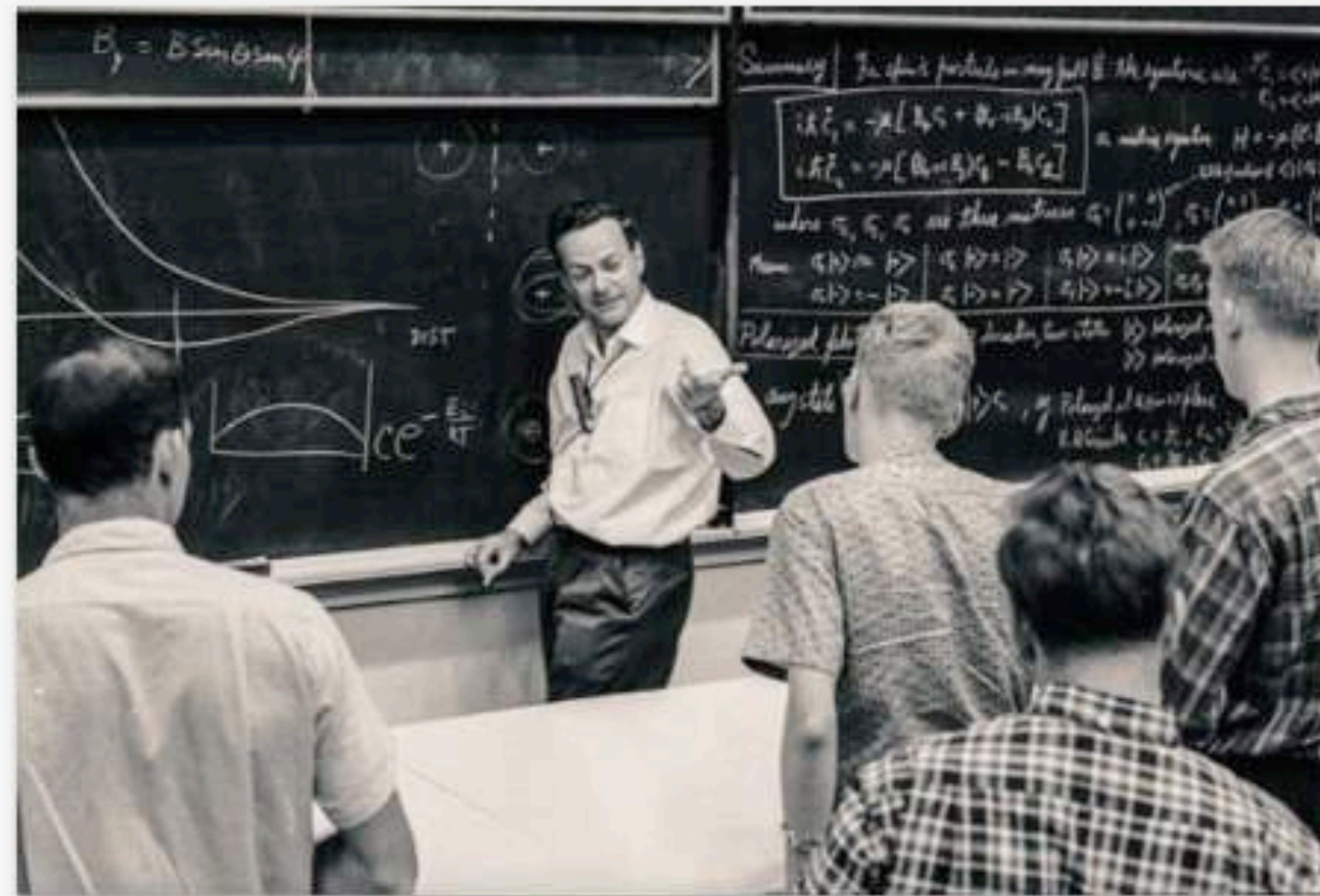


MACHINE LEARNING AS DESIGN MATERIAL

AI & Machine Learning Products

quality custom models. After uploading and labeling images, AutoML Vision will train a model that can scale as needed to adapt to demands. AutoML Vision offers higher model accuracy and faster time to create a production-ready model.

Faces	Labels	Web	Document	Properties	Safe Search	JSON
-------	--------	------------	----------	------------	-------------	------



DW60LFIVoAEageT.jpg

Web Entities

Richard Feynman	12.0585
The Feynman Lectures on Physics	1.0635
Lecture	0.7034
There's Plenty of Room at the Bo...	0.6104
Feynman's Lost Lecture	0.58485
Physics	0.5675
Physicist	0.501
Nanotechnology	0.4538
Science	0.4438
Theoretical physics	0.3251
Experiment	0.2966

MACHINE LEARNING AS DESIGN MATERIAL



Filter by

7 results

CATEGORY

Machine learning



Cloud Machine Learning Engine

Google

An API to enable creating and using machine learning models.



Cloud Natural Language API

Google

Provides natural language understanding technologies to developers. Examples include



Cloud Speech API

Google

Speech recognition



Cloud Translation API

Google

The Google Cloud Translation API lets websites and programs integrate with Google Translate...



Cloud Video Intelligence API

Google

Cloud Video Intelligence API.



Cloud Vision API

Google

Image Content Analysis



Dialogflow API

Google

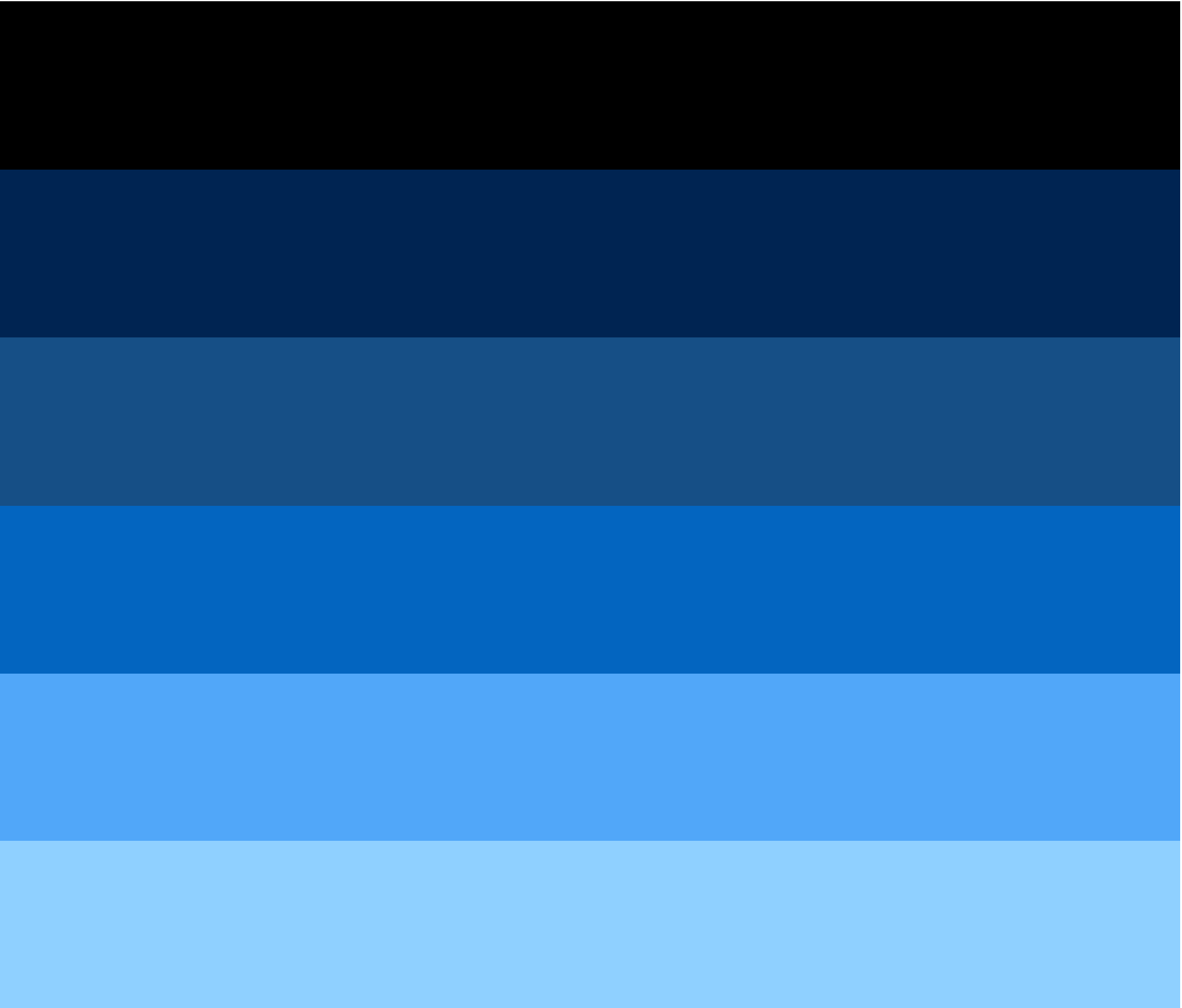
An end-to-end development suite for conversational interfaces.

MACHINE LEARNING AS DESIGN ARCHITECTURE

MACHINE LEARNING AS DESIGN ARCHITECTURE

INPUT VARIABLES

TARGET VARIABLE



8 hours of sleep

7.5 hours of sleep

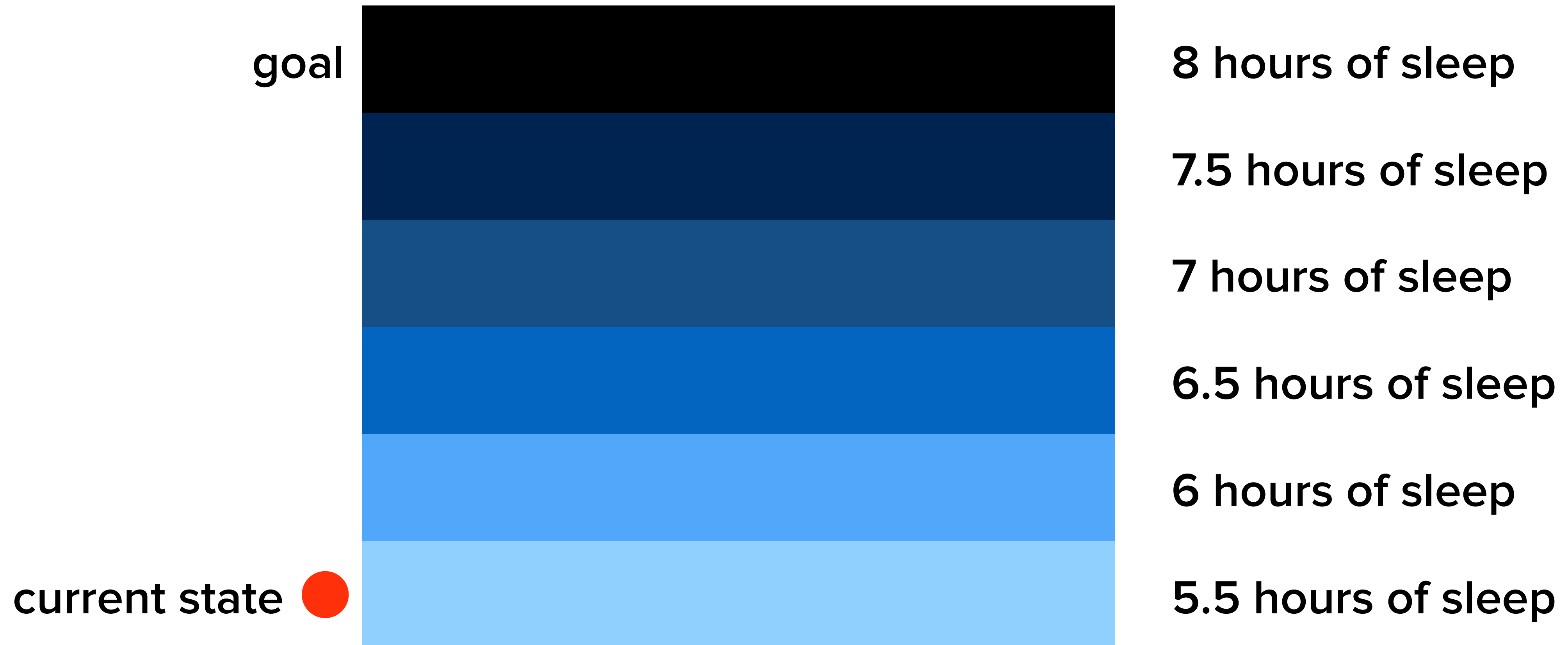
7 hours of sleep

6.5 hours of sleep

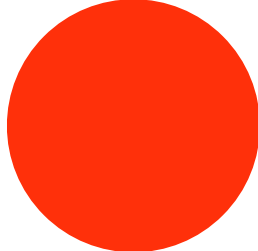
6 hours of sleep

5.5 hours of sleep

MACHINE LEARNING AS DESIGN ARCHITECTURE



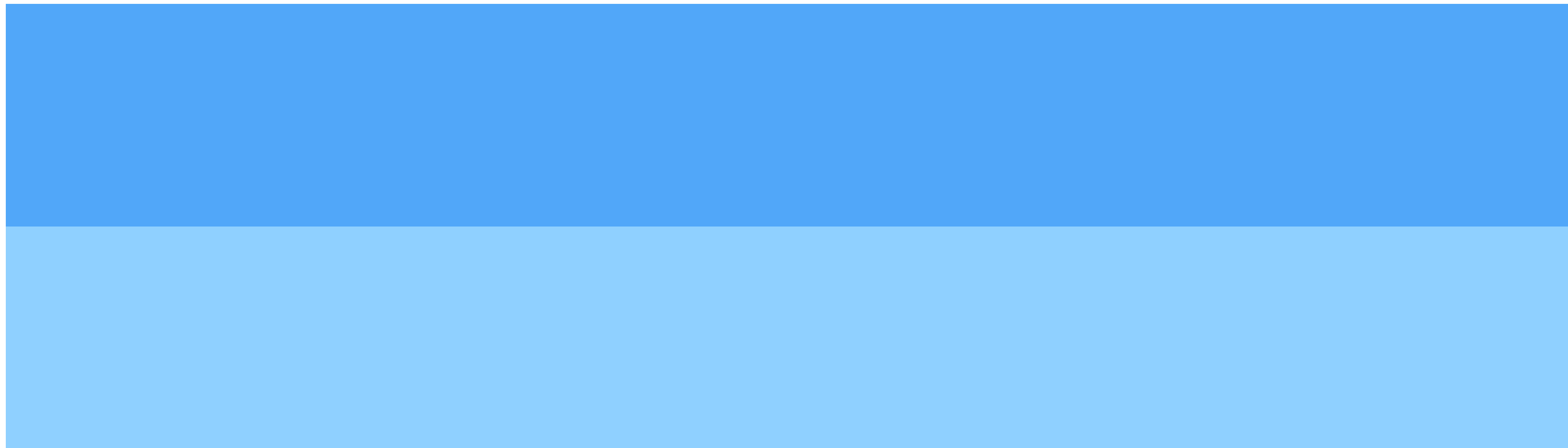
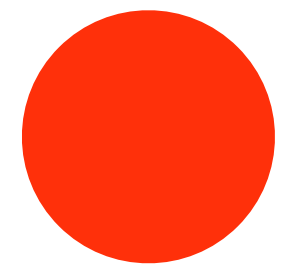
MACHINE LEARNING AS DESIGN ARCHITECTURE



5.5

6

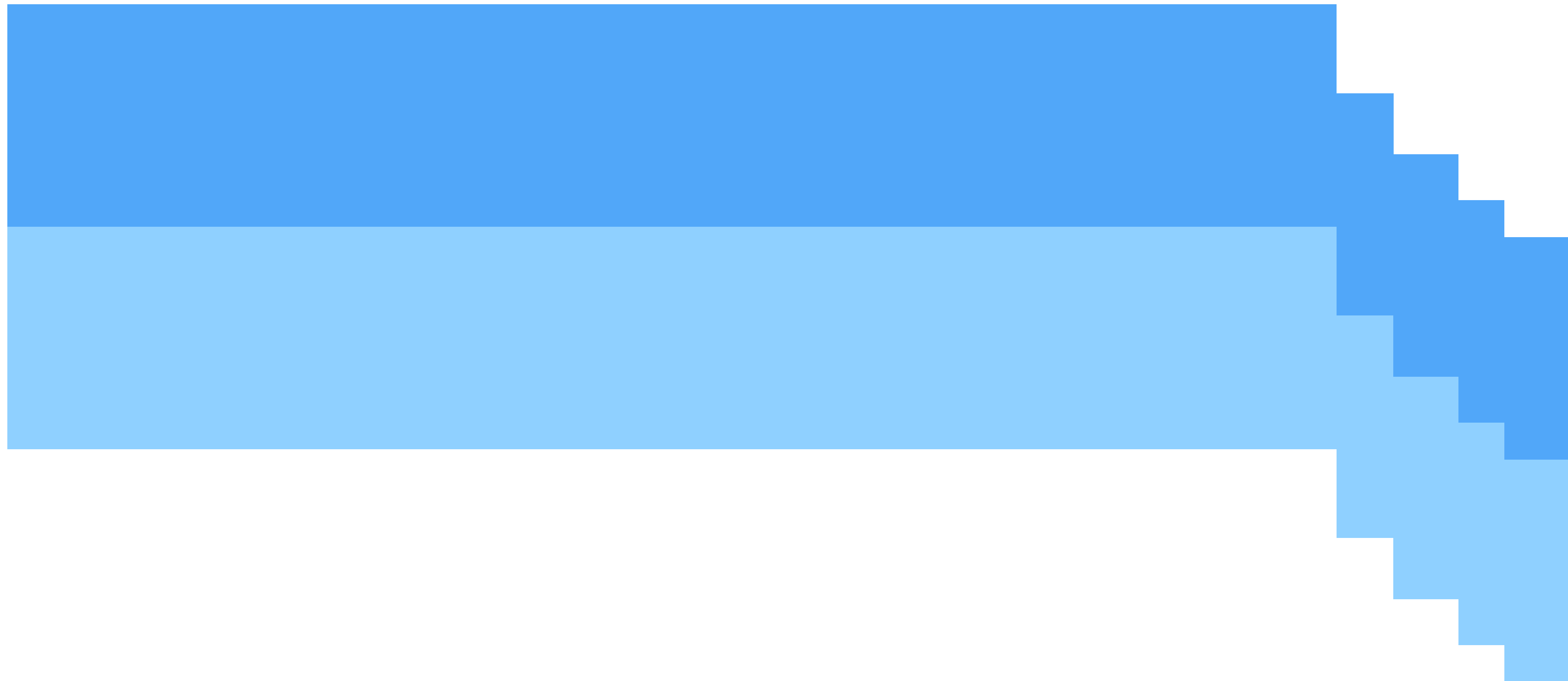
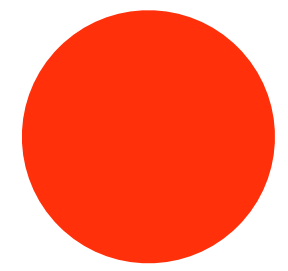
MACHINE LEARNING AS DESIGN ARCHITECTURE



5.5

6

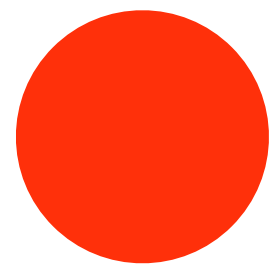
MACHINE LEARNING AS DESIGN ARCHITECTURE



6

5.5

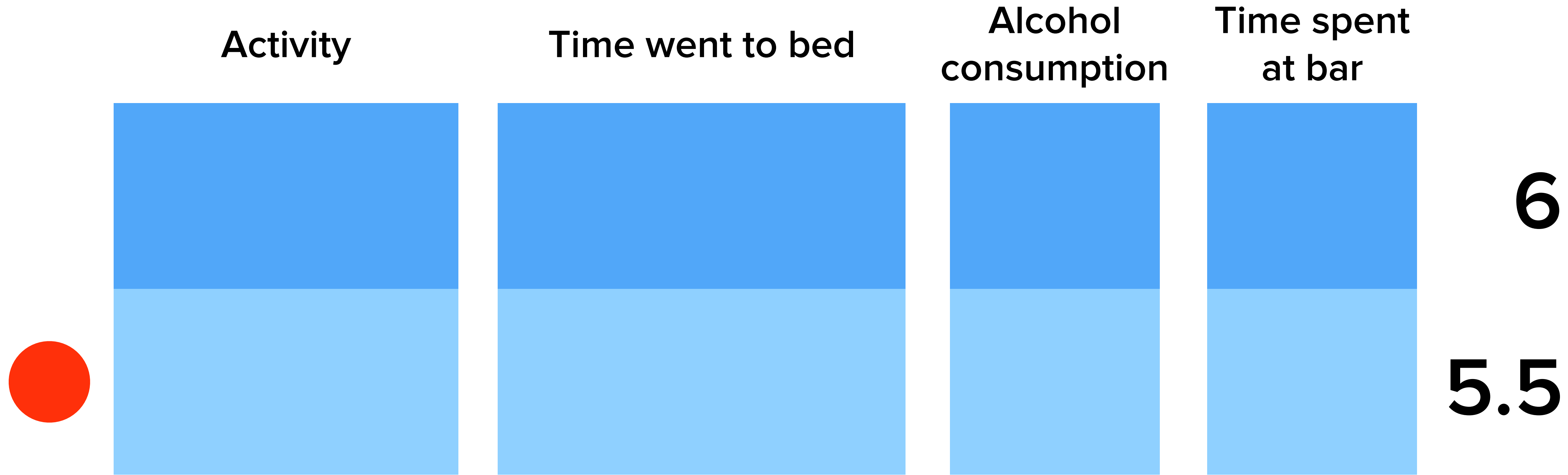
MACHINE LEARNING AS DESIGN ARCHITECTURE



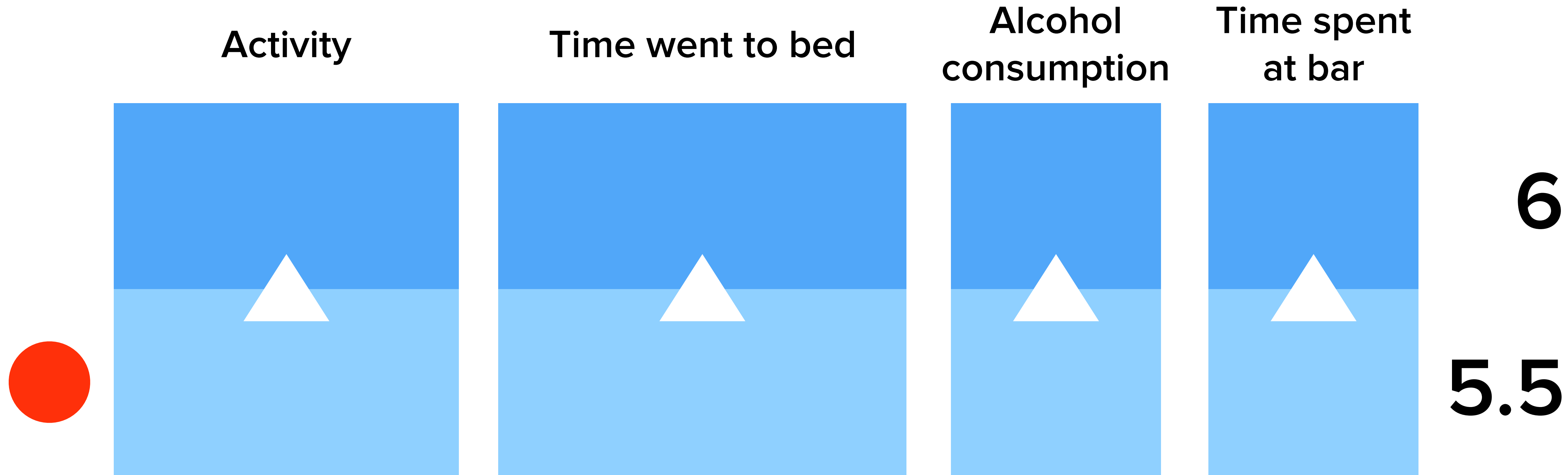
5.5

6

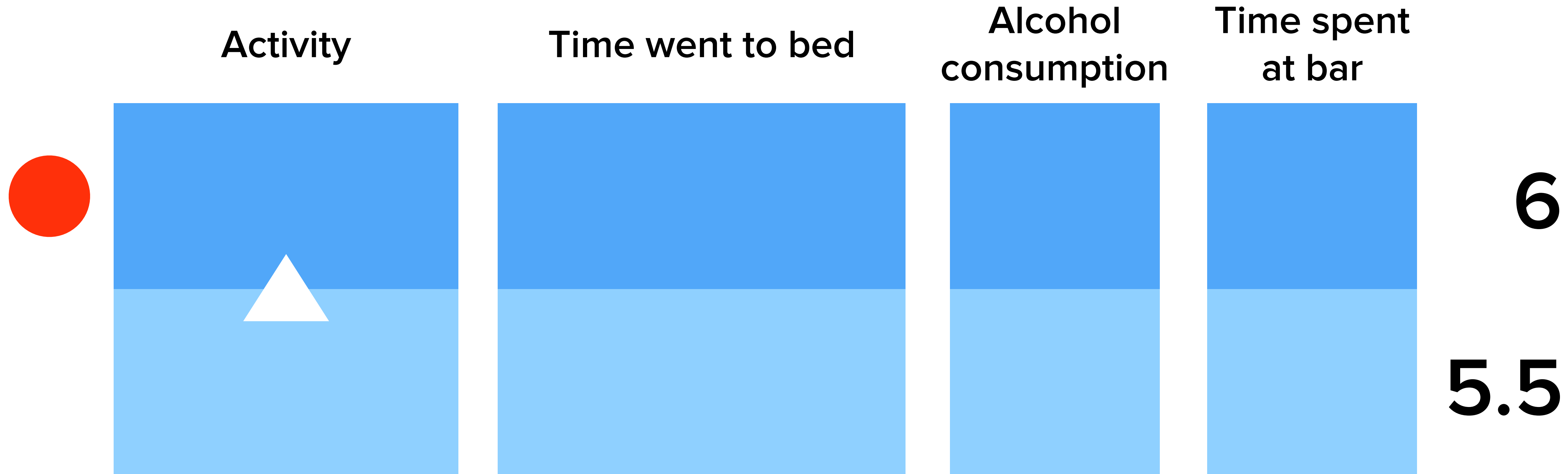
MACHINE LEARNING AS DESIGN ARCHITECTURE



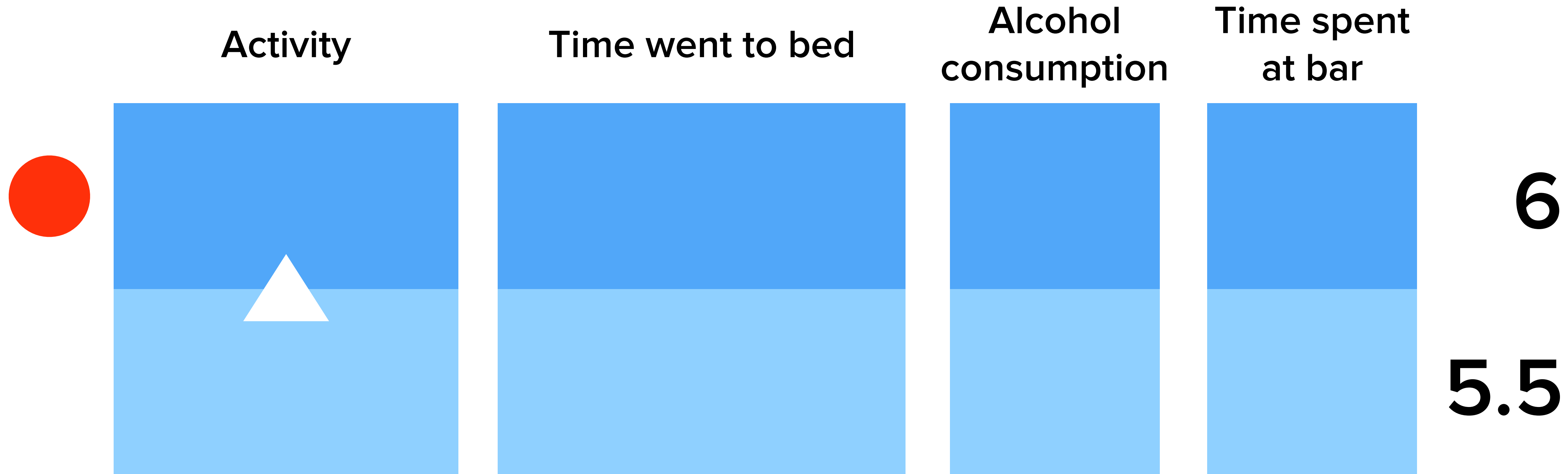
MACHINE LEARNING AS DESIGN ARCHITECTURE



MACHINE LEARNING AS DESIGN ARCHITECTURE



MACHINE LEARNING AS DESIGN ARCHITECTURE

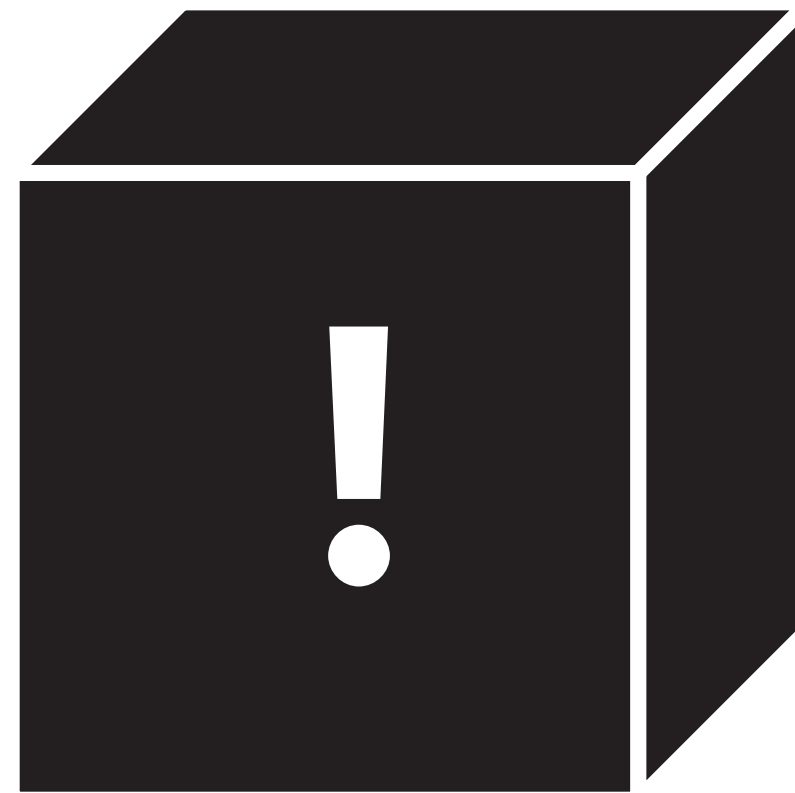


PROCESS

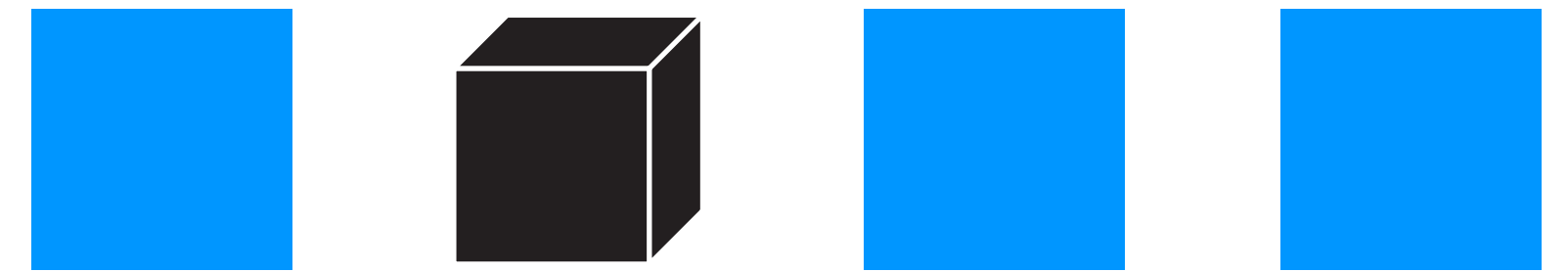
Designers need to do this.



Our Data

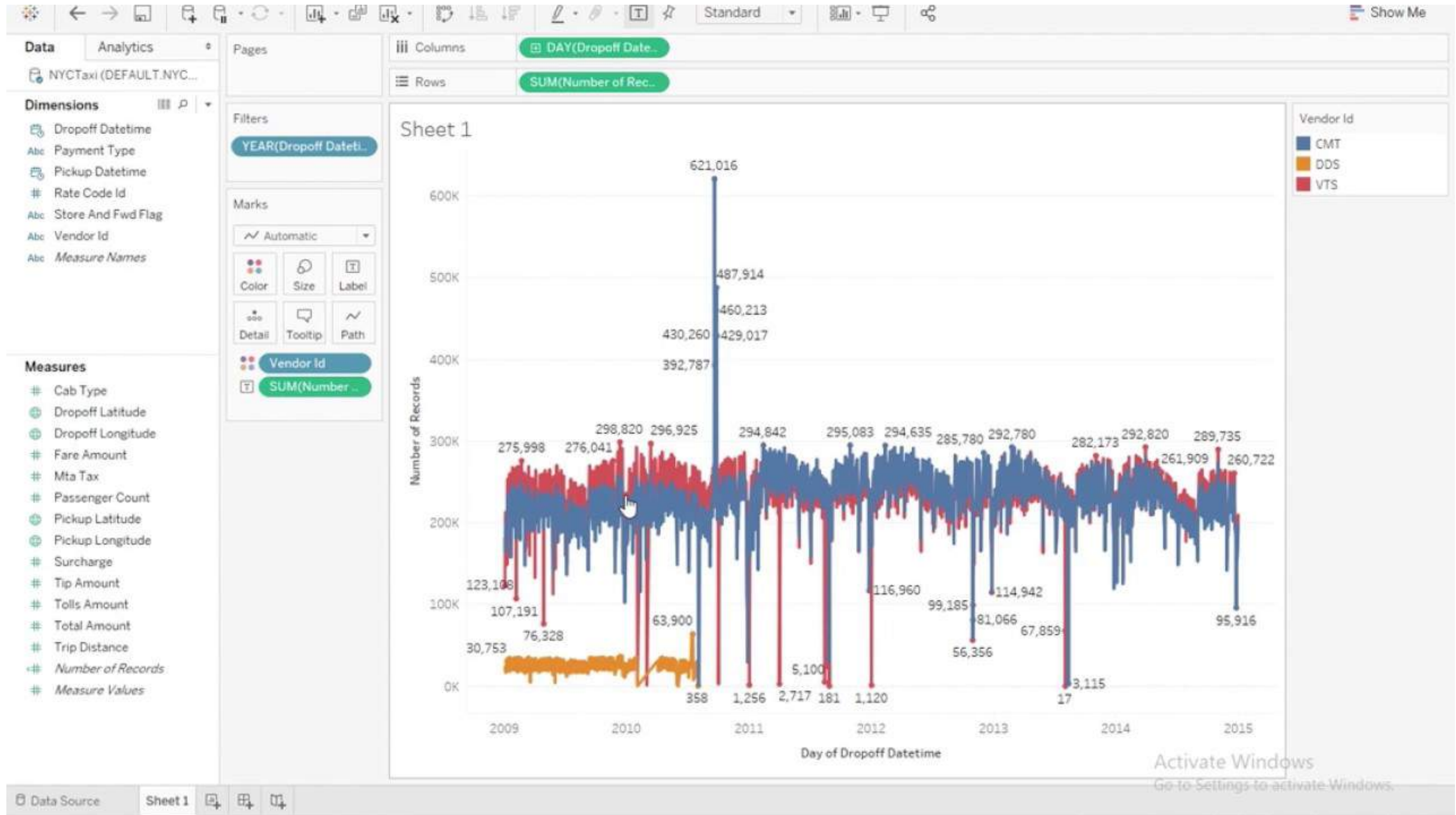


Model



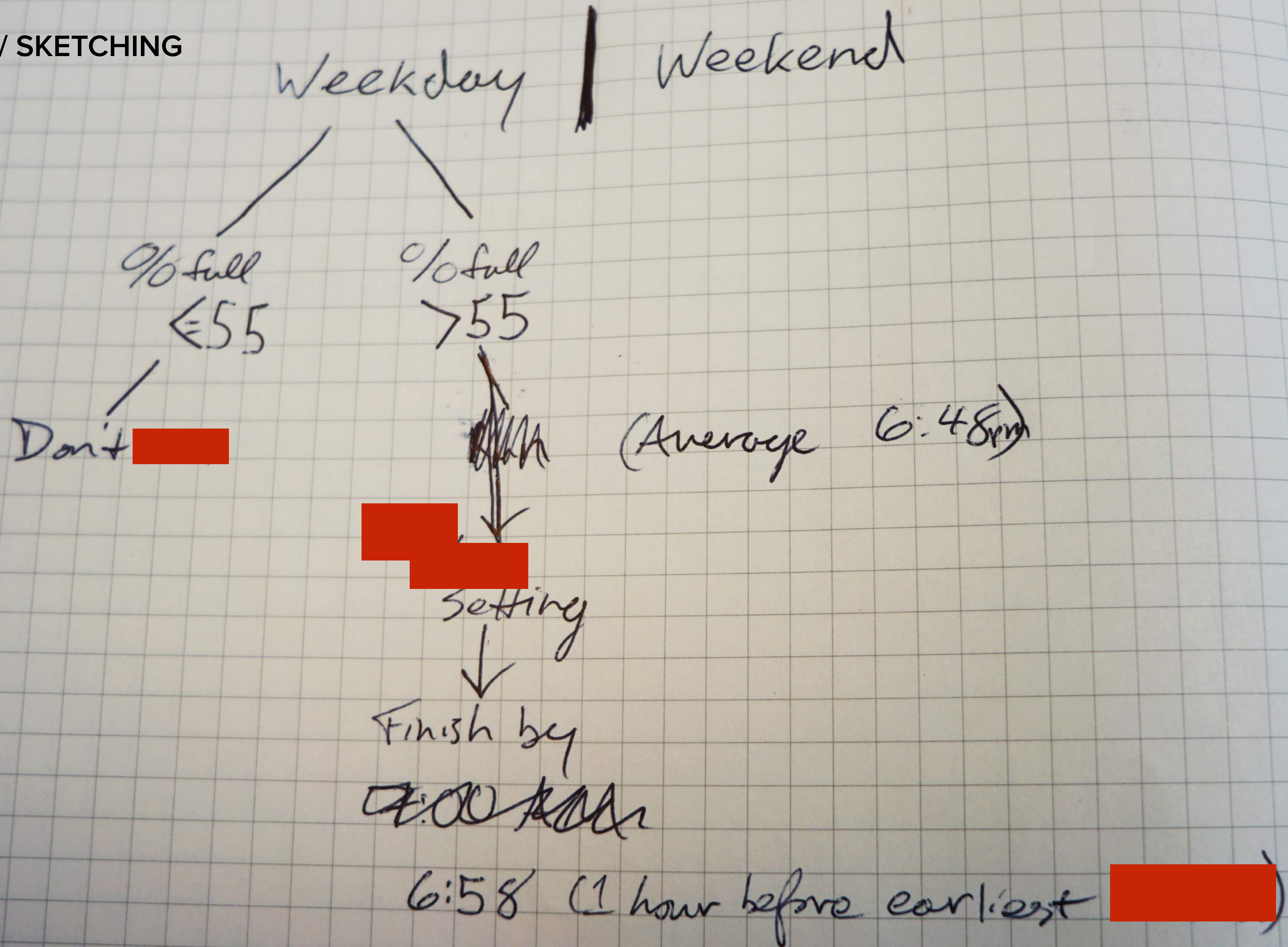
Small part of software

PROCESS / HANDS ON



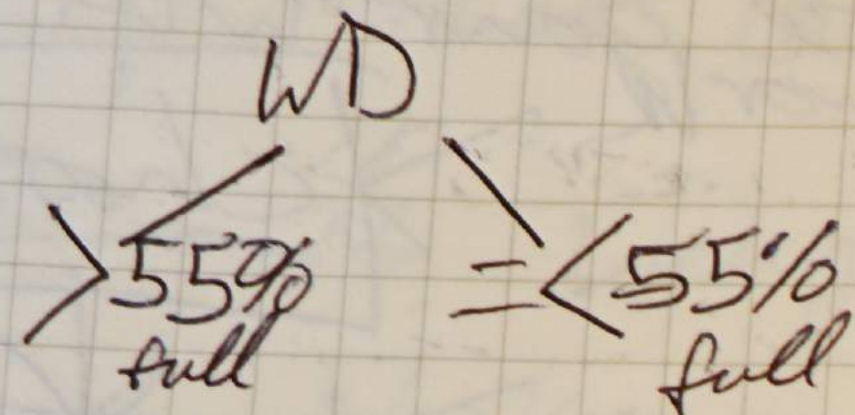
PROCESS / SKETCHING

PROCESS / SKETCHING

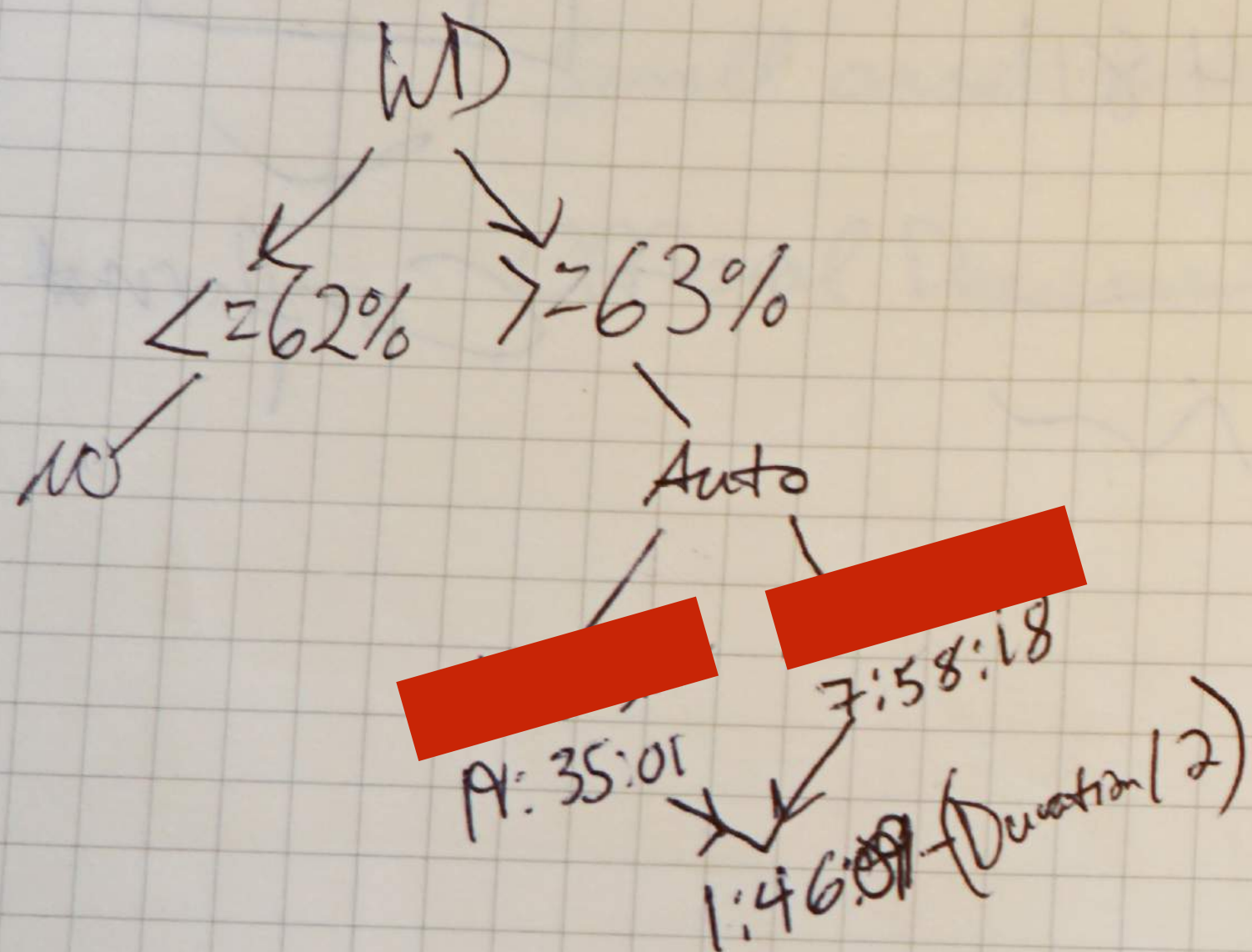


Decision Tree Sketch

PROCESS / SKETCHING



55 = high
70 = low
62.5%



Latest Start to
Earliest

19:35:01 → 7:58:18

4:25 | 7:58



~~12:22:19~~
6:11:085

+ 19:35:01

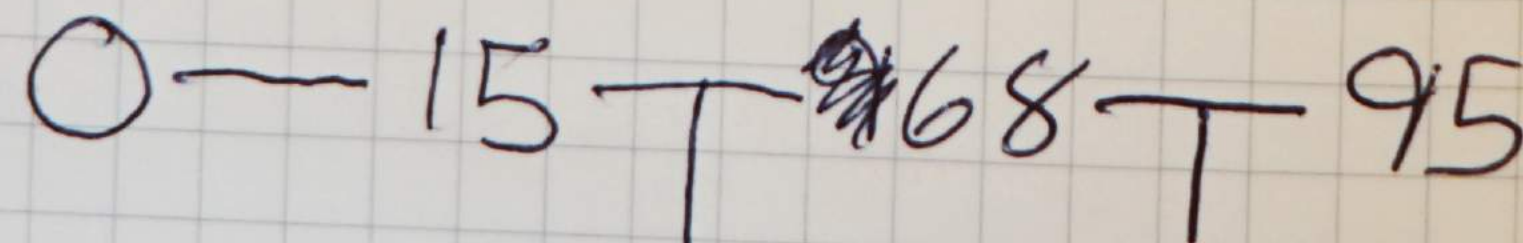
1:46:9.5

Does this work?
~~CO~~

Latest Sta

WE

>81.5



PROCESS / IDEATION

PROCESS / IDEATION

PROCESS / IDEATION

If it was a human, how would you tell them how to do it.

- What are the goals?
- What are the input variables?
- What is the target variable?

PROCESS / IDEATION

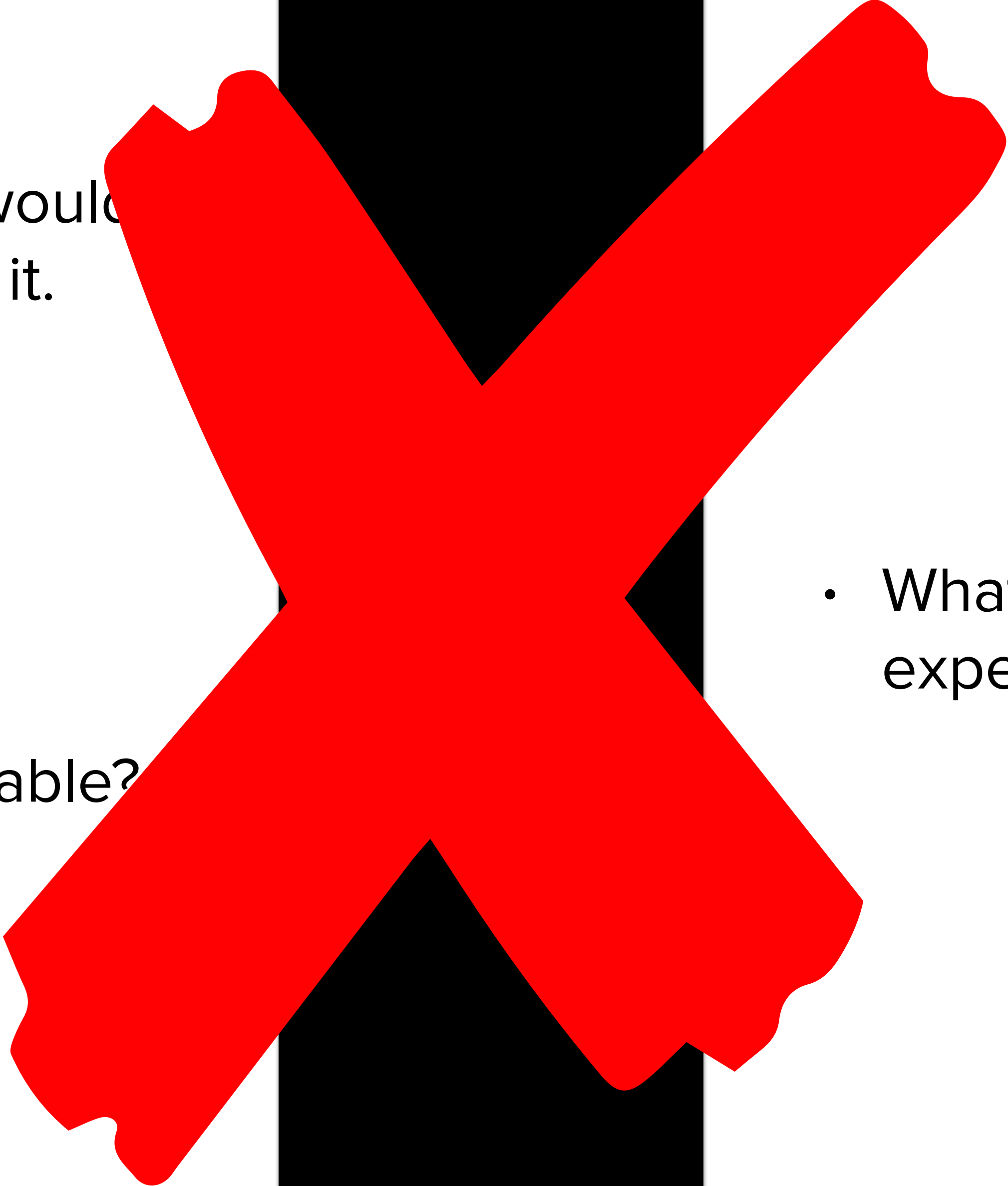
If it was a human, how would you tell them how to do it.

- What are the goals?
- What are the input variables?
- What is the target variable?

- What output are you expecting?

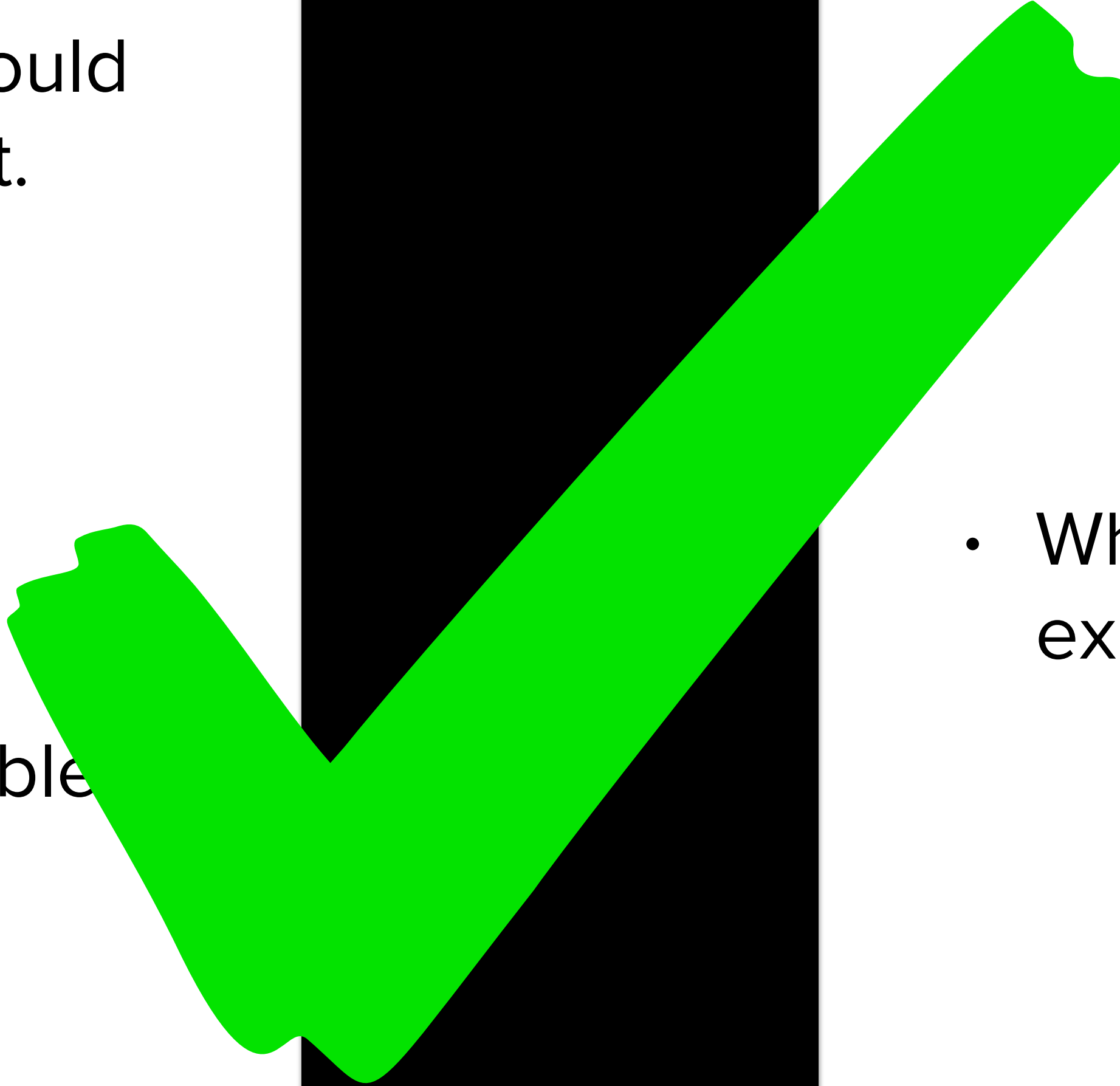
PROCESS / IDEATION

If it was a human, how would you tell them how to do it.

- What are the goals?
 - What are the input variables?
 - What is the target variable?
 - What output are you expecting?
- 

PROCESS / IDEATION

If it was a human, how would you tell them how to do it.

- What are the goals?
 - What are the input variables?
 - What is the target variable?
 - What output are you expecting?
- 

If it was a human, how would you tell them how to do it.

- What's your goal?
- What's your target variable?
- What are your input variables?
- what are your expected outputs?

ME3: IDEATION

GOAL

TARGET VARIABLE

INPUT VARIABLES

EXPECTED OUTPUTS

PROCESS / DIALOG

“... the center of design becomes the system and it's outcomes.
Design moves towards building emergent ecologies”

- Philip Van Allen, ArtCenter College of Design

PROCESS / DIALOG

USER INPUT

EXPLICIT FEEDBACK

- Goal setting
- Preferences
- Answering questions
- Manual Adjustments to their model

PROCESS / DIALOG

Action & Platform Games



American Football



Arts & Entertainment



Banking



Baseball



Basketball



Beauty & Fitness



Blues



Boating



Body Art



Books & Literature



Business & Industrial



Business News



Celebrities & Entertainment News



Classical Music



Computer & Video Games



Computers & Electronics



Condos & Townhomes



Cooking & Recipes



Country Music



Coupons & Discount Offers



Cycling



Dance & Electronic Music



Driving & Racing Games



Education



Enterprise Technology



Fashion & Style



Finance



Fitness



Folk & Traditional Music



Food & Drink



Foreign Language Study



Game Systems & Consoles



Games



Graphic Design



History



Home & Garden



Home Improvement



Jazz



Laptops & Notebooks



Local News



Mac OS



Machine Learning & Artificial Intellig...



Mathematics



Men's Interests



Mobile & Wireless



Mobile Phones



Movies



Music & Audio



News



Online Communities

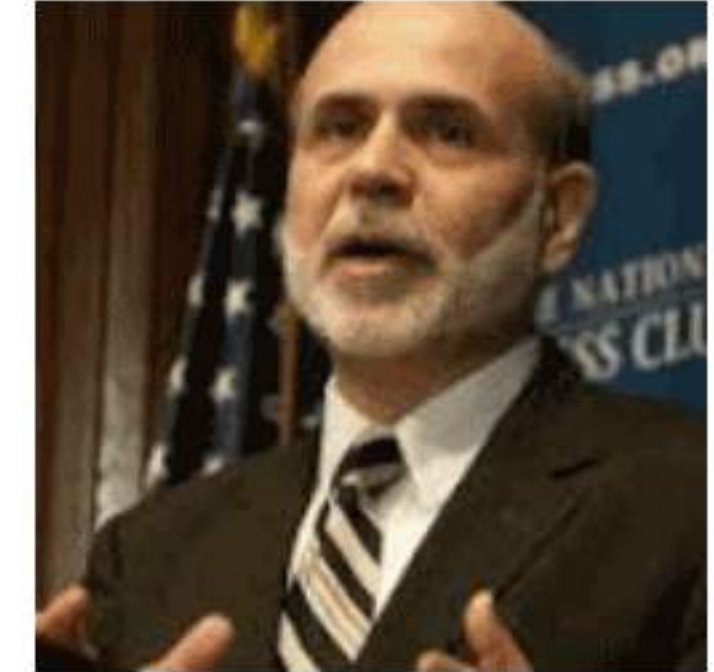




CoinDesk · 13 hours ago



Ben Bernanke: Bitcoin Has 'Serious Problems'



Former Federal Reserve chairman Ben Bernanke offered both muted praise and criticism when discussing bitcoin in a new...



Is this card useful right now?

NO

YES

USER INPUT

EXPLICIT FEEDBACK

- Goal setting
- Preferences
- Answering questions
- Manual Adjustments to their model

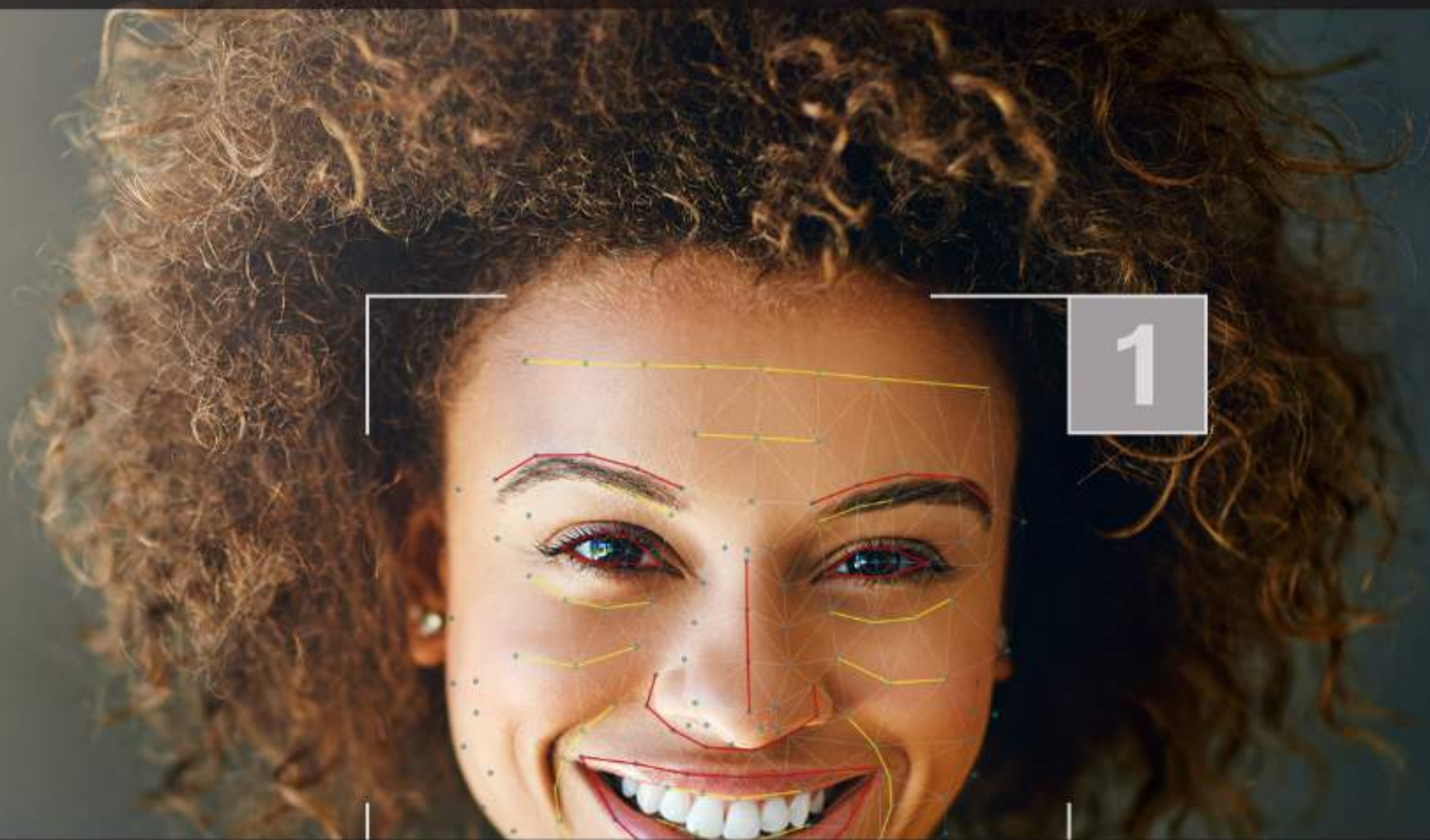
IMPLICIT FEEDBACK


- Adjustments to behavior
- Changes in engagement

TRANSPARENCY

- Demonstrate the decision provenance in the structure of the dialog
- Say where you got the data
- Show a confidence score (classification)
- Show the next couple guesses (classification)
- Don't speak in absolutes

PROCESS / DIALOG





Face ID
Unknown

Demographics
Gender: Unknown
Age: Unknown
Ethnicity: Unknown

Individual Emotional Profile

99.60 %

- Happiness
- Surprise
- Sadness
- Disgust
- Fear
- Anger
- Neutral

Head Pose

Roll: -3
Yaw: 0
Pitch: 28

CONFERENCE AND EXPO
the future of virtual currency

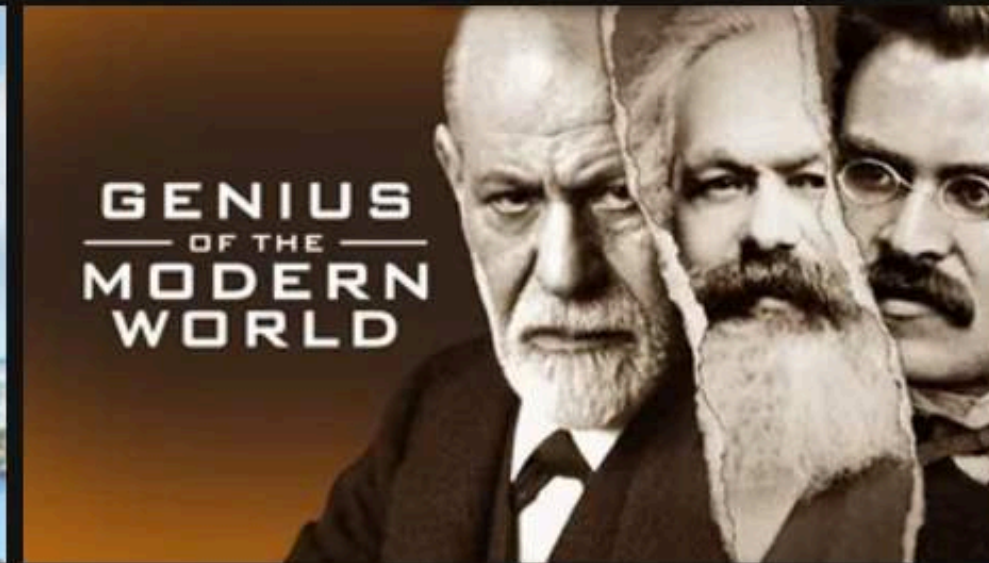


Banking on Bitcoin

99% Match 2017 TV-14 1h 23m

Banks? Who needs 'em? A behind-the-scenes look at the disruptive digital currency that's 100% anonymous.

Like, Dislike, Add



Trending Now



DIALOG / PROTOTYPING

DIALOG / PROTOTYPING

Action & Adventure



Inspiring Movies



Comedies



DIALOG / PROTOTYPING



DIALOG / ∞

DIALOG / ∞

FEEDBACK

IMPROVEMENT

How would you tell a human how to improve the predictions?

AWARENESS

What assumptions should the model not make?

BIAS

BIAS TYPES

- Input bias, in your source data
- Introduced bias, in your algorithm
- Learned bias, learned by your model

AWARENESS

- What is the system learning?
- What is it learning from?
- How is it using this knowledge in its decisions?

THANK YOU!

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LPK

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LPK.com



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