

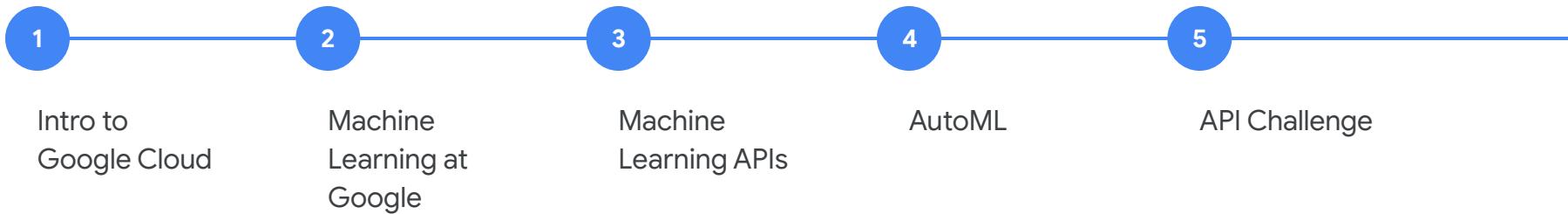


Machine Learning on Google Cloud

[INSERT NAME AND ROLE HERE]

[INSERT HACKATHON NAME HERE]

Agenda



Me explaining
cloud
computing Hackers



Dictionary

cloud



cloud

/klaʊd/

noun

1. **Getting things done using someone else's computers**, especially where someone else worries about maintenance, provisioning, system administration, security, networking, failure recover, etc.

What is Google Cloud Platform?

Google Cloud Platform lets you build and host applications and websites, store data, and analyze data, all on Google's highly scalable and reliable computing infrastructure.



Popular Google Cloud Products

App Engine - Deploy web apps and mobile backends to the Cloud



Firebase - Mobile development platform featuring the realtime database



Firebase

Databases - Cloud Firestore (NoSQL), Cloud SQL (MySQL + PostgreSQL), Cloud Storage



**Cloud
Firestore**



SQL

Google Maps Platform

Maps APIs - static & dynamic maps, Street View imagery, and 360° views



Routes APIs - help users get from A-Z with comprehensive data and real-time traffic

Google Maps Platform

Places APIs - rich location data for over 150 million places

Machine Learning on Google Cloud





Puppy
or
Muffin?



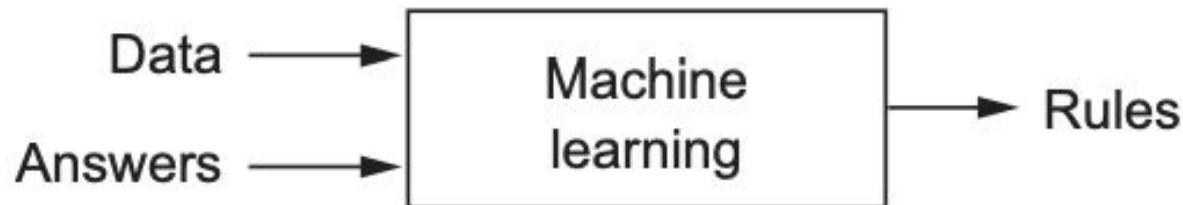
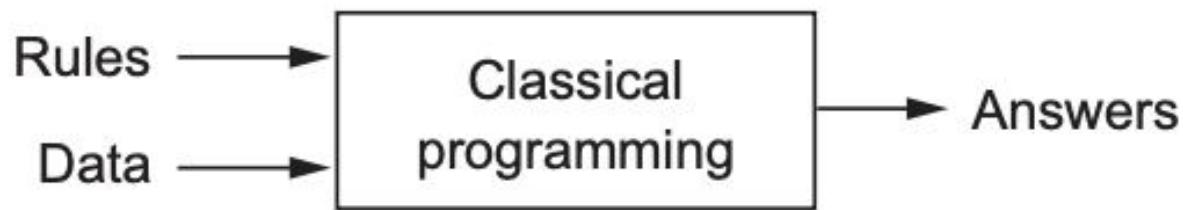


“The brown quick fox jumps over the lazy dog.”

Syntax rules for adjective order in English:

- Quantity or number
- Quality or opinion
- Size
- Age
- Shape
- Colour
- Proper adjective (often nationality, place of origin, or material)
- Purpose or qualifier

**Machine learning is learning
from rules plus experience.**



What is Machine Learning?

- “Machine Learning is the study of computer algorithms that improve automatically through experience.” ~IEEE
- “Machine Learning is using data to answer questions.” ~Yufeng Guo, Developer Advocate at Google
- Data -> Model -> Prediction

Google PhotosThe background of the entire image is a photograph of a massive, translucent blue iceberg floating in dark water under a cloudy sky. A black smartphone is centered in the foreground, displaying the Google Photos mobile application. The screen shows a search results page for the query "Dogs". At the top, there's a back arrow, the search term "Dogs", a close button, and a more options menu. Below this, the date "Feb 28" is displayed above a grid of four photos showing dogs. The date "Feb 26" is then shown above a larger grid of twelve photos. The bottom portion of the screen is blank, suggesting a scrollable list of images.

← Dogs

Feb 28



Feb 26





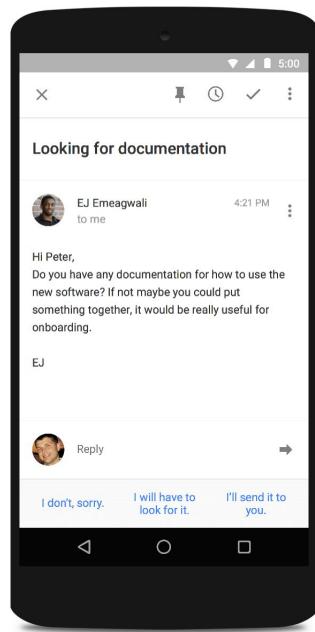
“Ok Google”



Google Translate



Gmail Smart Reply



Machine Learning on Google Cloud



What Type of Problem are you Trying to Solve?

Example: image classification

Generic task

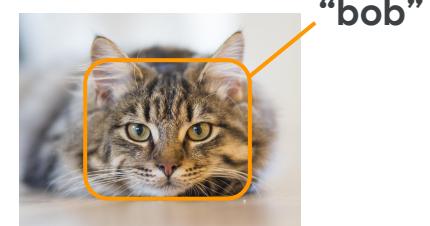
Custom task

Someone else has
solved this before

Specific to
your dataset



“cat”



“bob”

Google Cloud Machine Learning APIs

- Gain insights from data using Google Cloud's pre-trained machine learning models
- Leverage same technology as Google Photos and Google Assistant
- Require ZERO prior knowledge of ML



**BUILDING
YOUR
OWN ML MODEL**

**USING
GOOGLE CLOUD
MACHINE
LEARNING APIs**

Let's say I'm a meteorologist...



I want to predict weather trends and flight plans from images.



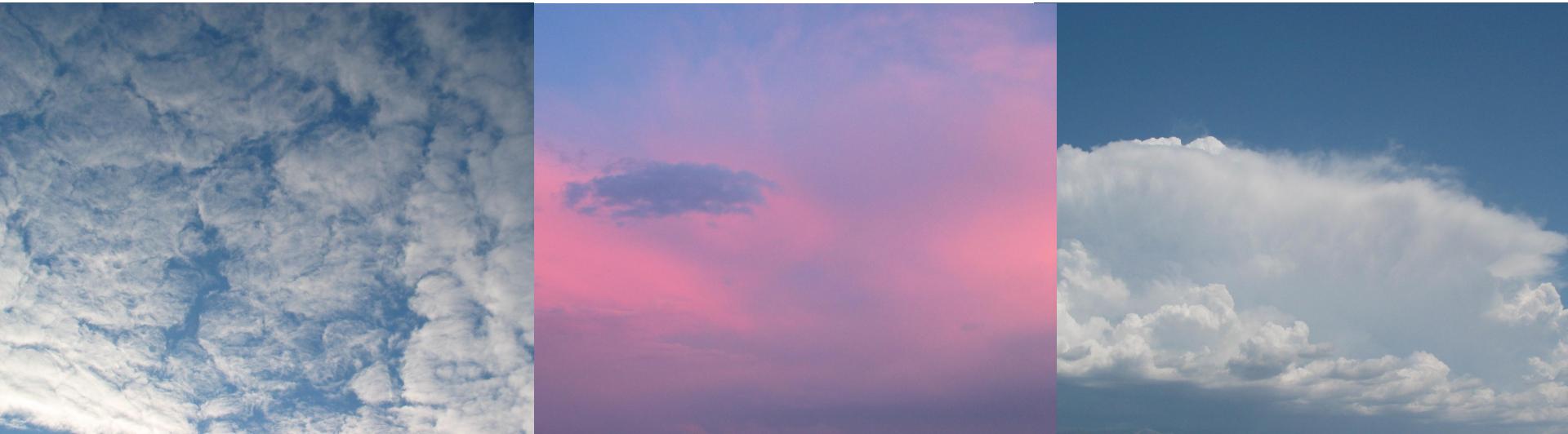
Can we use the cloud to analyze clouds?



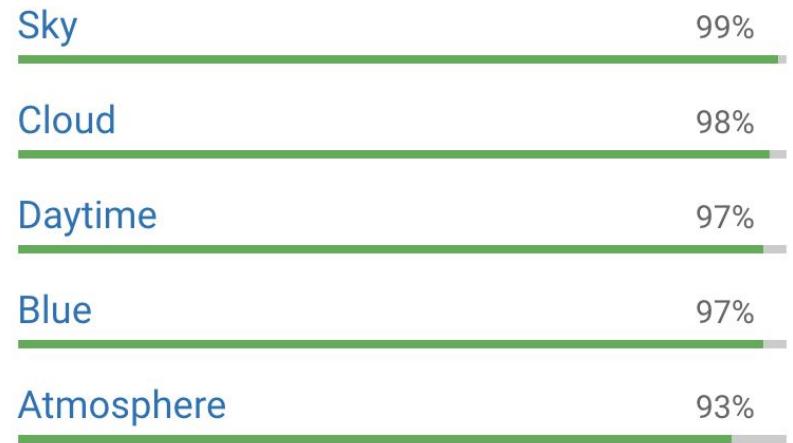
There are 10+ different types of clouds.



They all indicate different weather patterns.



Let's try the Vision API.



Google Cloud AutoML

- Google Cloud AutoML allows you to upload your own labeled training set and automatically builds out a machine learning model for you.
- Available in Vision, Natural Language, Video Intelligence, Translate, and Tables.
- [Quickstart Tutorial](#)



Google Cloud AutoML

Upload and label
images



Handbag

Shoe

Hat

Train your model



Evaluate



Model is now trained and ready to make prediction.
This model can scale as needed to adapt to customer demands.

Google Cloud AutoML Example

- **Goal:** Classify whether photos are of your own dog (named ‘Meiko’) or not.
- **Dataset:** Upload a labeled training set of dog photos (half Meiko and half other dogs) to AutoML.
- **Model Generation:** AutoML builds you a machine learning model to classify photos as ‘Meiko’ or ‘Not Meiko’.



Google Cloud AutoML Example

Google Cloud Platform automl-vision

Vision Meiko LABEL STATS EXPORT DATA

Dashboard Datasets Models

IMPORT IMAGES TRAIN EVALUATE TEST & USE Single-Label Classification

All images 65 Filter images

Labeled 65

Unlabeled 0

Filter labels

Meiko 33

NotMeiko 32

ADD NEW LABEL

Meiko(1) Meiko(1) NotMeiko(1)

Meiko(1) Meiko(1) Meiko(1)

Meiko(1) Meiko(1) Meiko(1)

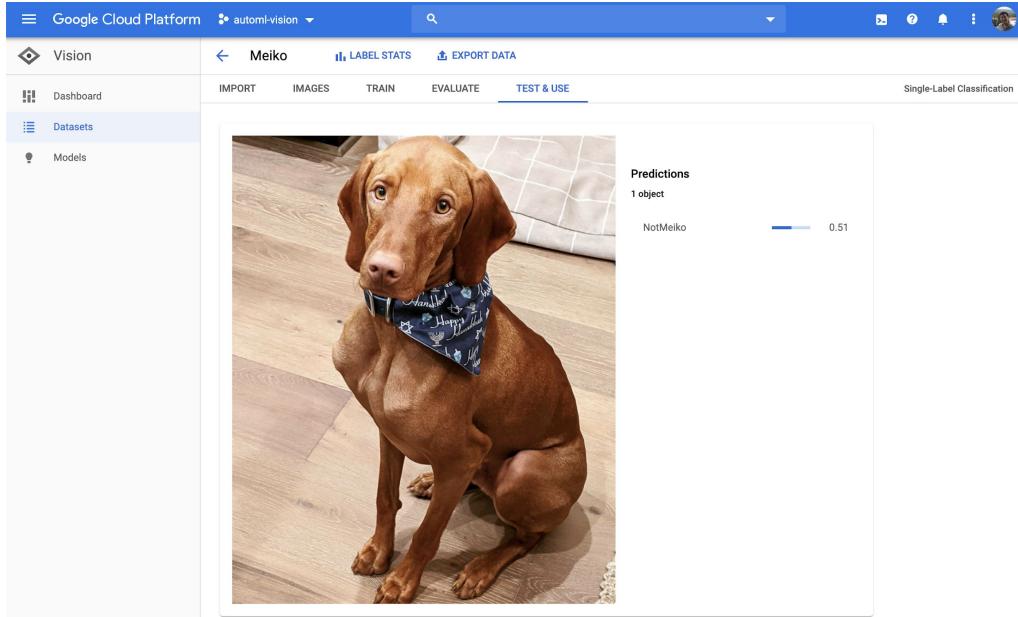
All labels

| | |
|--------------|--------|
| Total images | 56 |
| Test items | 9 |
| Precision ? | 88.89% |
| Recall ? | 88.89% |

Google Cloud AutoML Example

The screenshot shows the Google Cloud AutoML Vision interface. The top navigation bar includes the Google Cloud Platform logo, the project name "automl-vision", a search bar, and various navigation icons. On the left, a sidebar lists "Vision", "Dashboard", "Datasets" (which is selected), and "Models". The main content area displays a model named "Meiko" with options to "LABEL STATS" and "EXPORT DATA". Below this, tabs for "IMPORT", "IMAGES", "TRAIN", "EVALUATE", and "TEST & USE" are shown, with "TEST & USE" being the active tab. A status message indicates that the model is deployed and available for online prediction requests, with a "REMOVE DEPLOYMENT" link. A notice for beta users mentions the v1beta1 API endpoint's scheduled deletion and provides a link to redeploy the model. At the bottom, there is a section titled "Test your model" with a "UPLOAD IMAGES" button and a note stating "Up to 10 images can be uploaded at a time".

Google Cloud AutoML Example



API Challenge

Best Use of Google Cloud - use any Google Cloud product to qualify (Firebase counts!)

Every member of the winning team receives:

- Google Nest Mini
- Patagonia Backpack
- Cloud Pillow
- Acrylic Trophy
- Water Bottle



API Challenge

Best Use of Google Cloud - use any Google Cloud product to qualify.

Every member of the second place team receives:

- Google Nest Mini



API Challenge

Best Use of Google Cloud - use any Google Cloud product to qualify.

Every member of the third place team receives:

- Google Nest Mini



API Challenge

Firebase, Google Maps APIs, and more count for our API Challenge.

Visit cloud.google.com/products for the full list of Google Cloud products.



Google Cloud Credit Coupons

Check for an email from Major League Hacking (MLH) to activate \$50 in Google Cloud free credits!



<< Test First Name >>,

We're excited that you've registered or applied for << Test Most Recent Event >> this weekend, and can't wait to see what you build.

To get started, Google Cloud and MLH are sharing free Google Cloud credits. This gives you access to use the same tools and infrastructure that power Google products for your own project.

Claim your credits:

1. Login to your preferred [Google Account](#) to use during << Test Most Recent Event >>.
2. Make sure you can access console.cloud.google.com while signed in.

Some account domains don't have GCP enabled. If you receive an error message when signing into console.cloud.google.com, use a different account.

CLAIM CREDITS

Resources

- **Vision API** - <https://cloud.google.com/vision/docs/>
- **Natural Language API** - <https://cloud.google.com/natural-language/docs/>
- **AutoML** - <https://cloud.google.com/automl/>
- **Google Cloud Hackathon Toolkit** - goo.gle/hackathon-toolkit

Questions or Need Help?

