Machine Learning on Google Cloud

[INSERT NAME AND ROLE HERE]

[INSERT HACKATHON NAME HERE]

Google Cloud

Agenda

1. Intro to Google Cloud
2. Machine Learning at Google
3. Machine Learning APIs
4. AutoML
5. API Challenge

Me explaining cloud computing

Hackers

Google Cloud

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.

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Popular Google Cloud Products

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

Firebase - Mobile development platform featuring the realtime database

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

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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

Places APIs - rich location data for over 150 million places

Google Maps Platform

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Machine Learning on Google Cloud

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Puppy or Muffin?

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

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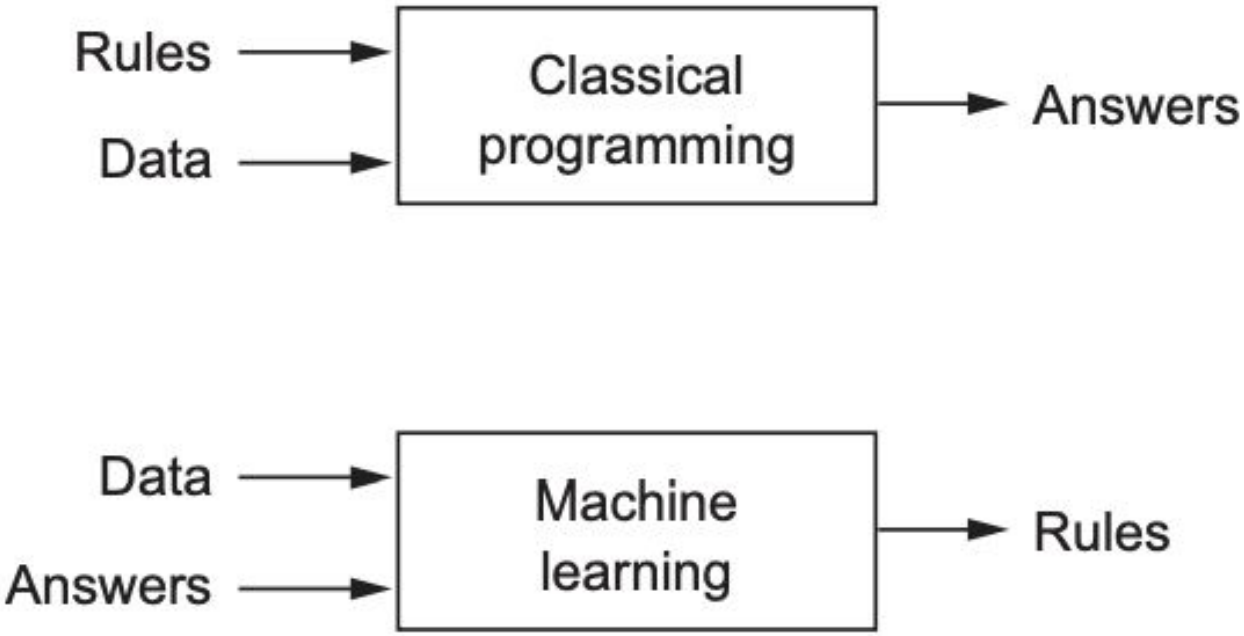
Syntax rules for adjective order in English:

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

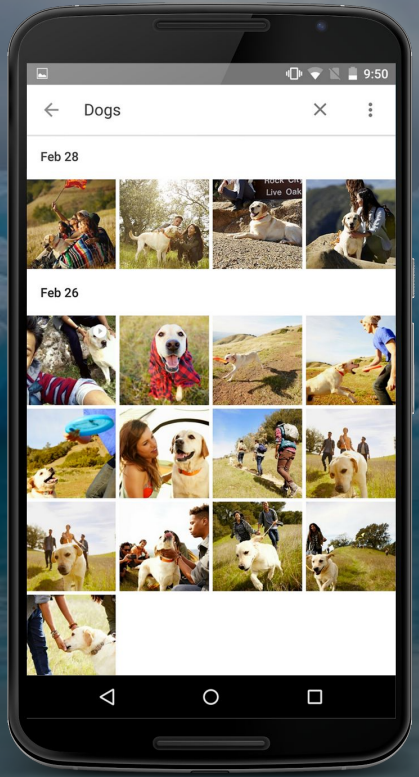
Machine learning is learning from rules plus experience.


Rules
Data
Classical programming
Answers
Data
Answers
Machine learning
Rules

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

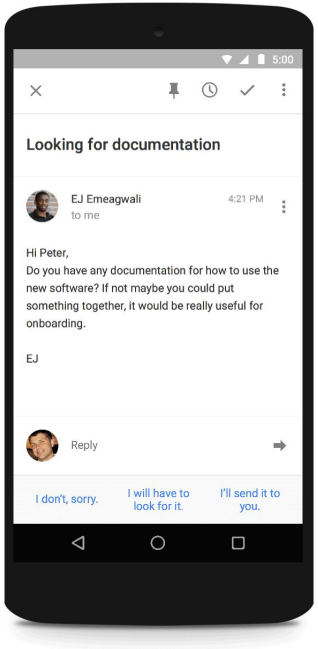
Google Photos




“Ok Google”

Google Translate

Gmail Smart Reply



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Machine Learning on Google Cloud

App developers

Machine Learning APIs

AutoML

Custom Model

Data scientists &
ML practitioners

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What Type of Problem are you Trying to Solve?

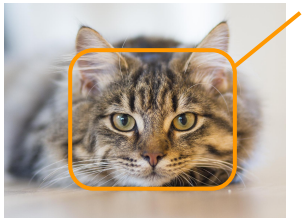
Example: image classification

Generic task — **Custom task**

Someone else has solved this before

Specific to your dataset

“cat”



“bob”

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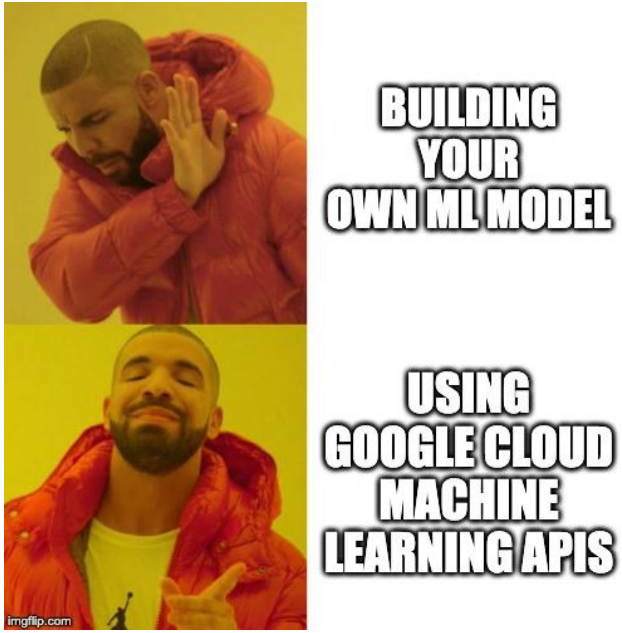
Google Cloud Machine Learning APIs

- **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



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Let’s say I’m a meteorologist...

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

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Can we use the cloud to analyze clouds?

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There are 10+ different types of clouds.



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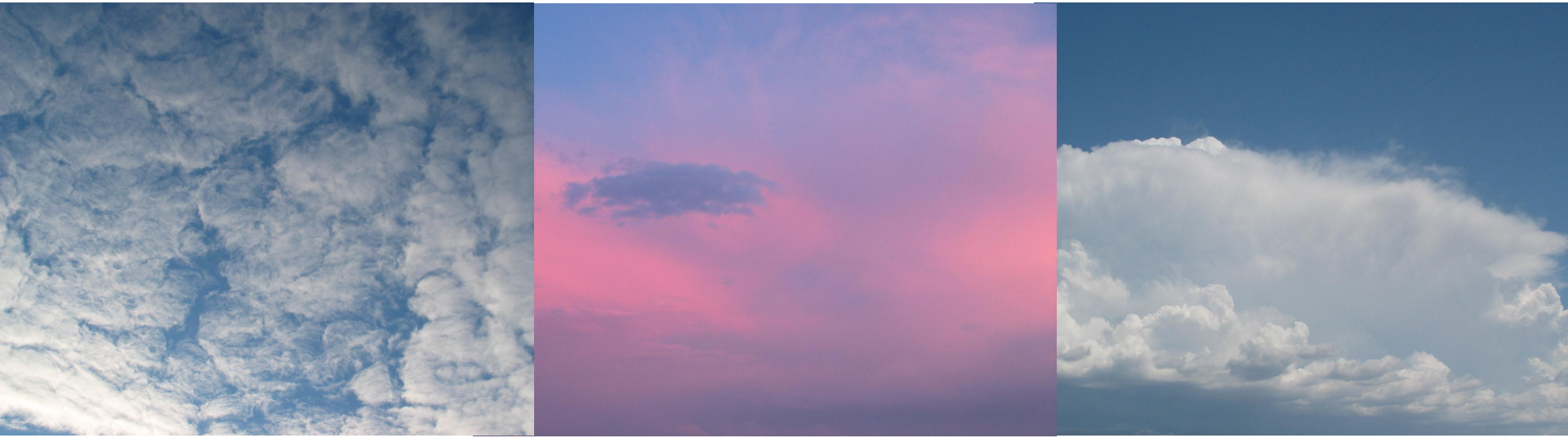
They all indicate different weather patterns.



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Let’s try the Vision API.

Sky	99%
Cloud	98%
Daytime	97%
Blue	97%
Atmosphere	93%

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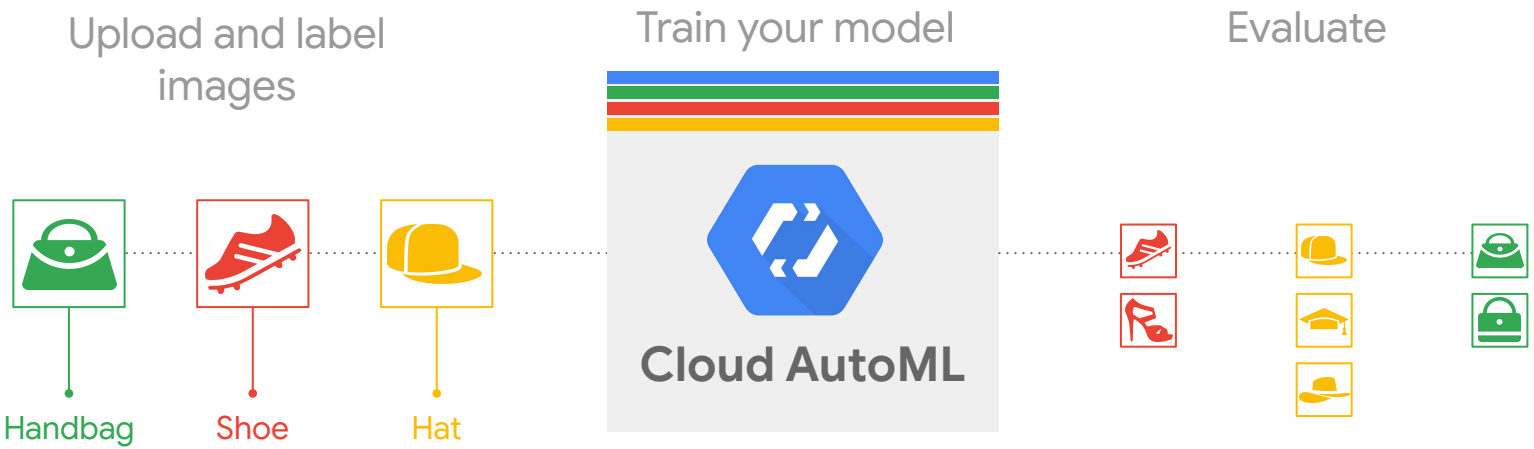
Google Cloud AutoML

- **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



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

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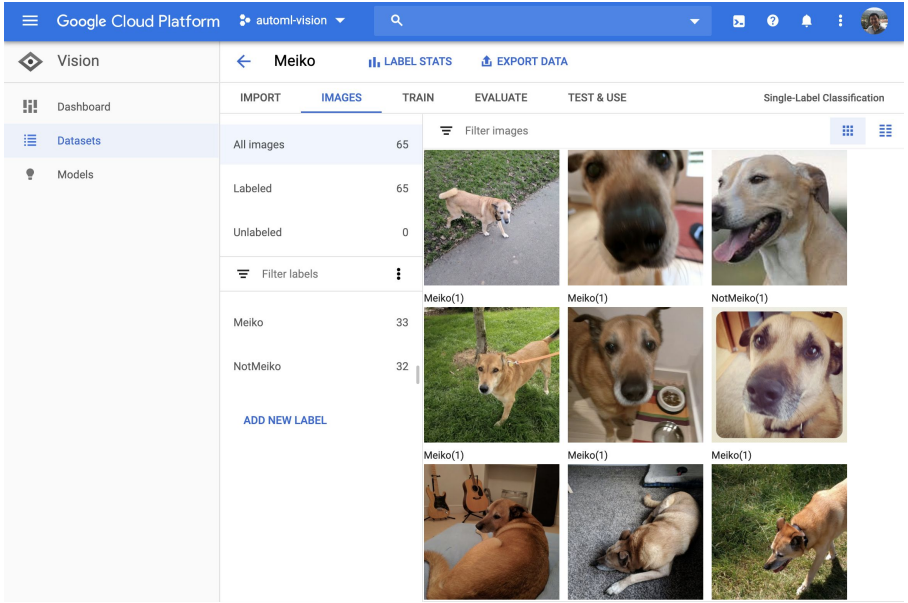
Google Cloud AutoML Example

- **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



All labels

Total images	56
Test items	9
Precision	88.89%
Recall	88.89%

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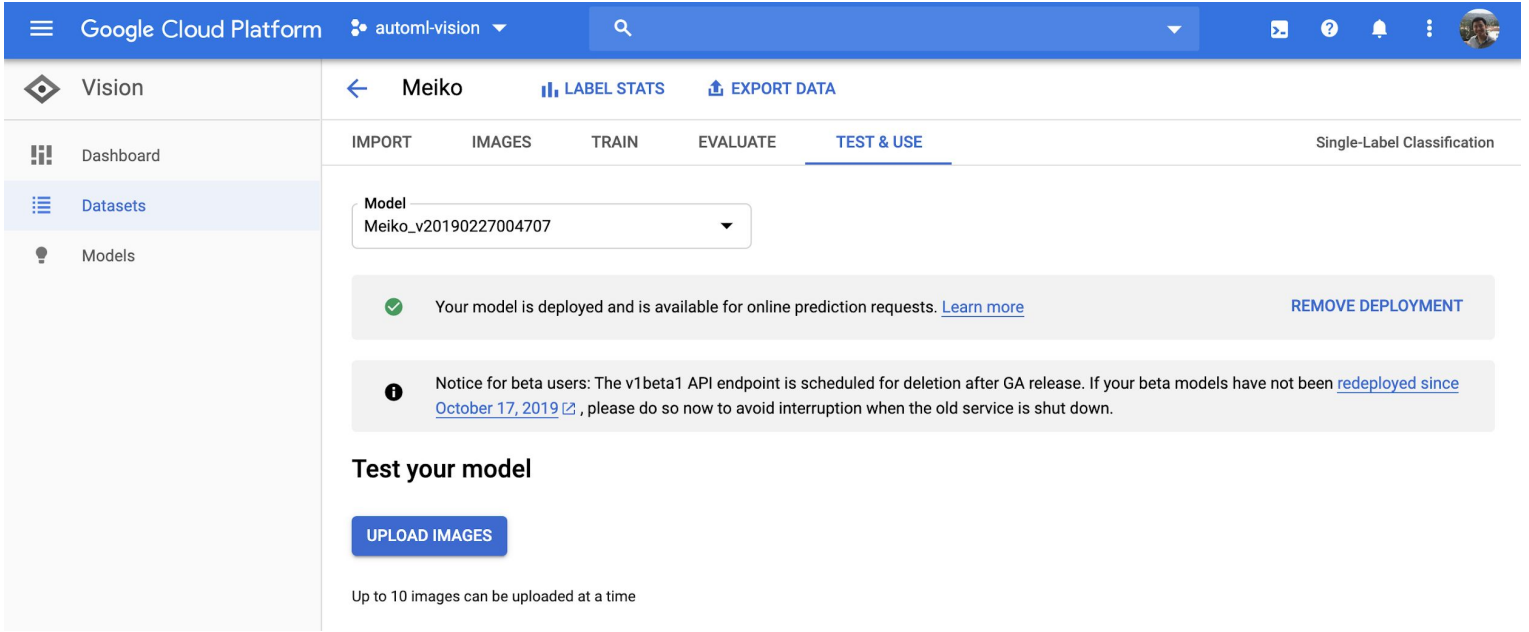
Google Cloud AutoML Example



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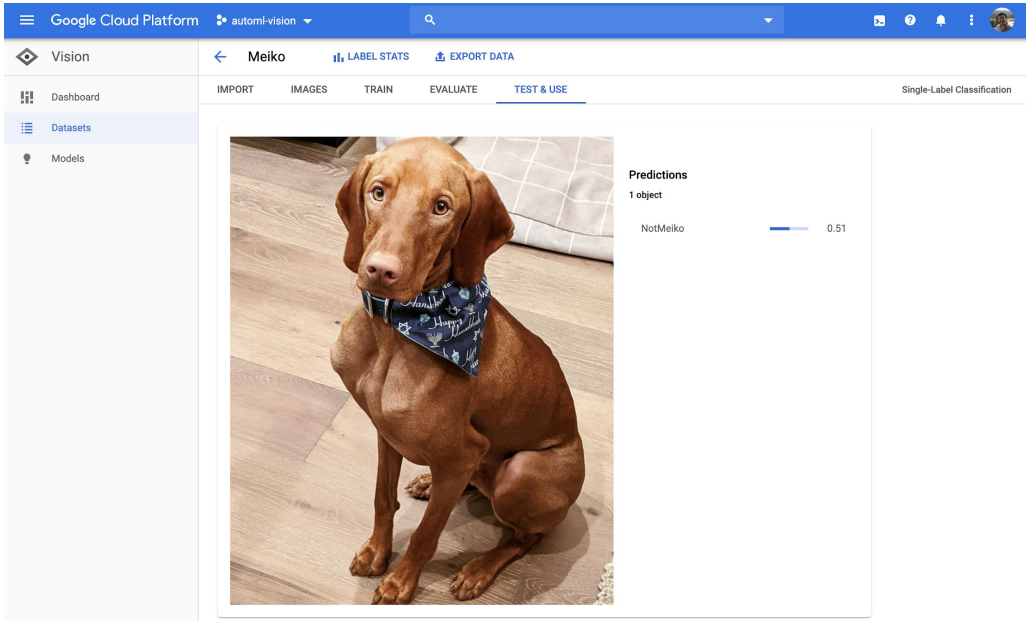
Google Cloud AutoML Example



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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

Google Cloud

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

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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

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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.

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Google Cloud Credit Coupons

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

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MLH
MAJOR LEAGUE HACKING

<< 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.

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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?

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