

A vibrant, cartoon-style illustration of a treasure hunt scene. In the center, a large, open treasure chest with a red lid and yellow body sits on a grey, rocky mound. The chest is overflowing with gold coins, and a treasure map is visible inside. A skull and crossbones symbol is on the front of the chest. To the right, a pirate sword with a yellow hilt and a blue blade is stuck in the ground. The background is a light blue sky with white dashed lines forming a path. A compass rose is in the top left, and a star is in the top right. In the bottom left, a red 'X' is marked on a dashed line. The title 'Treasure Hunt' is written in a large, dark blue, serif font.

Treasure Hunt

Let's start

01

Introduction





Treasure hunt app gameplay

There are 2 main modes for a user:

- **Game mode:** a player searches and selects a game to play, where each game is composed by a set of steps that need to be solved.
- **Make mode:** a user can create a game for other player by defining the steps of which it is made of.





Step types



Camera



The player has to guess an object by a question and make a photo of it



Position

The player has to guess a place to go by a question





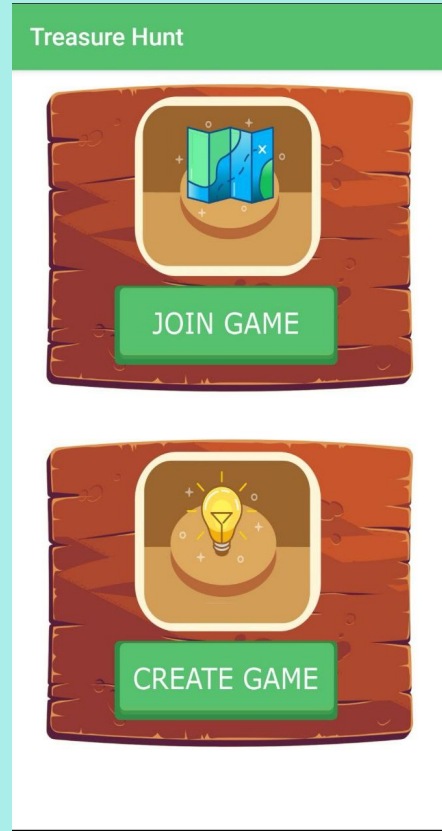
Hints

The player has a maximum of 3 hints
in each game to answer a question





Initial Activity





02


Game Frontend






Search Game Activity



 Treasure Hunt

Join Game



JOIN GAME



Search Game Activity



Treasure Hunt

Join Game



p



pippo (3 steps): 30

prova 2 (2 steps): 32

provola (2 steps): 33

JOIN GAME

Game Activity



Position step
counter

Image step
counter

Steps question

Check step

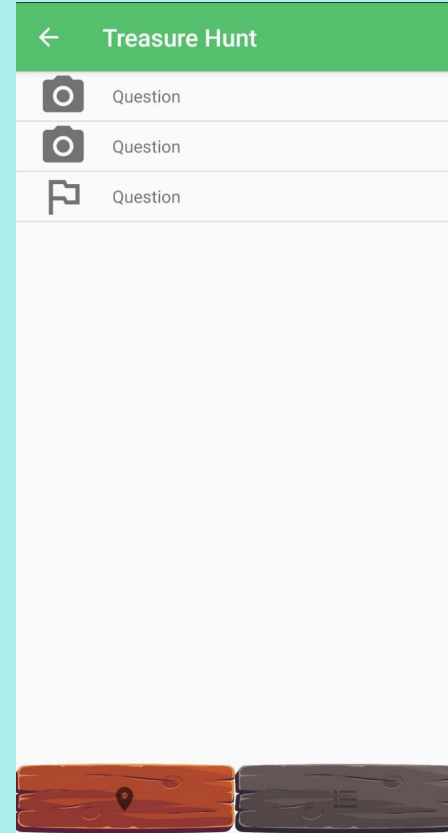
Step hint

Steps list



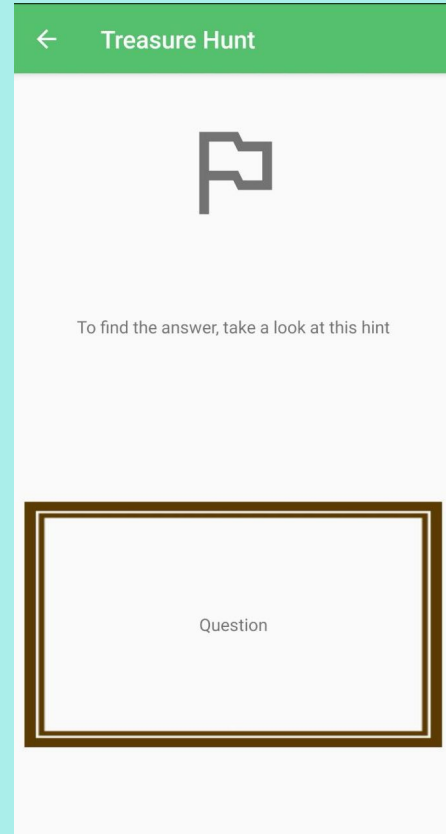


Steps list Activity





Question Activity



Camera Hint Activity



Insert
field

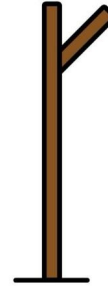
Treasure Hunt

Hangman

_ _ r _

OK

Letters
found



Hint to
add new
letter

HINT

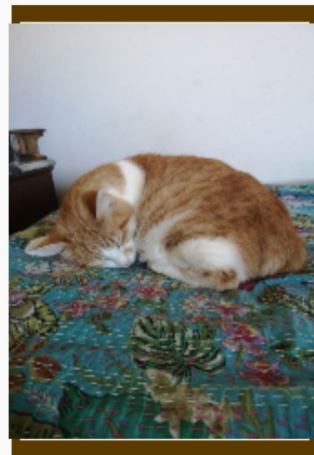


Camera check Activity



Treasure Hunt

Congratulations



Well done! You found it!

CONTINUE



Success Activity



Treasure Hunt



CONGRATULATIONS

Hint used: 0

HOME

03

Make Frontend





Game Name form Activity

*Everyone can also create own
educational game just clicking on Make
button*



Maker Map Activity

Most important activity for the maker
Three buttons to interact with:

- *Place for place steps*
- *Camera for recognition steps*
- *Finish to conclude*





Place Activity

← Treasure Hunt

What is your question?

Question1

CONFIRM

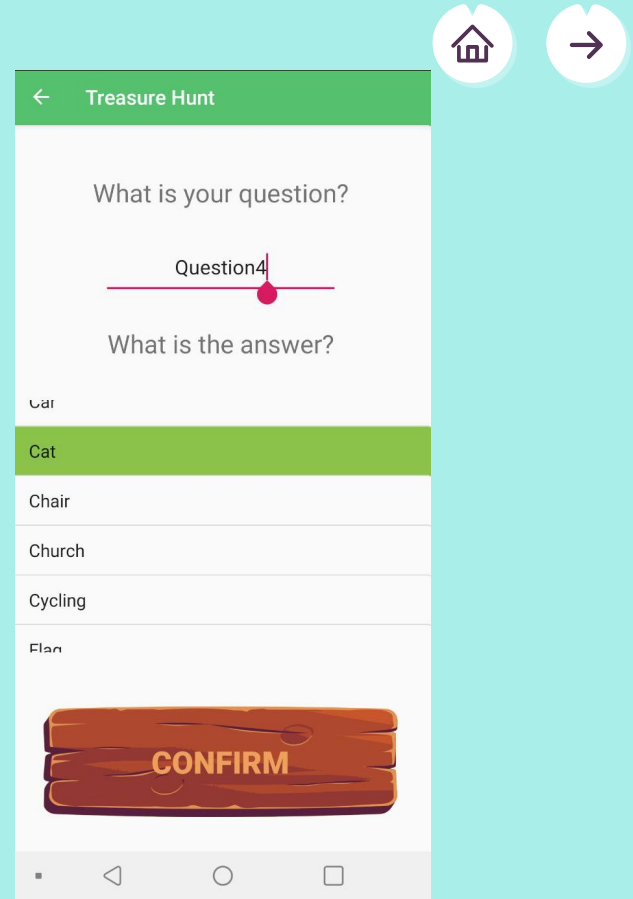


Camera Activity

ScrollView contains some label contained in ML Kit

Constraints:

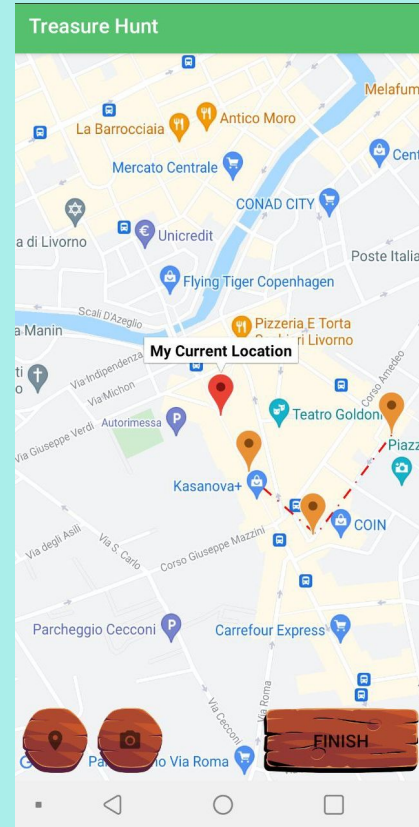
- *Not empty question*
- *No selected options*





Maker Map Activity

Constraint: At least two steps



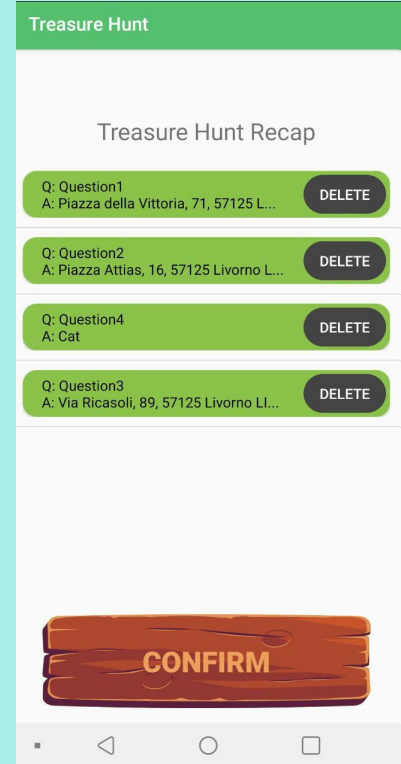
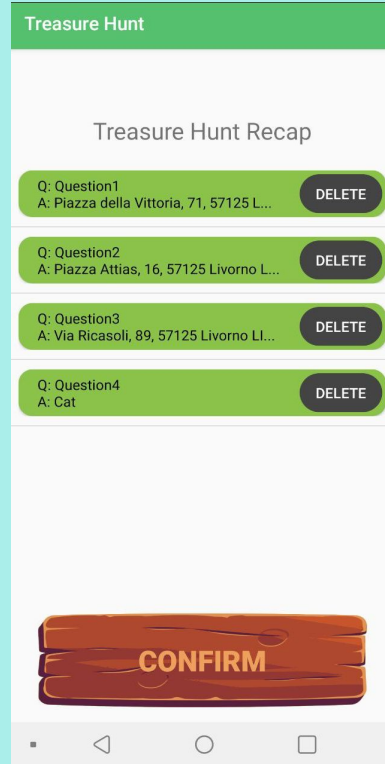


Recap Activity

Consistency handle

- drag and drop
- delete
- back button

Clicking on finish: POST request and gameld response using Volley





Success Creation Activity



Treasure Hunt created!

108

Congratulations! This is your Gameld. It will be necessary to play. SAVE IT to do not forget it!

CONFIRM



Database

MySQL database contains a simple table

Each row of this table represents a step of a given Treasure Hunt

gameID	step	gameName	question	answer	stepType
109	1	Test piazza	Question	lat/lgn: (37.4219...	1
109	2	Test piazza	Question	Car	0
108	1	Test	Question	Bird	0
108	2	Test	Question	School	0





Backend

Maven project with the following dependencies:

- Spring boot: allows to realize the backend application and define the REST calls using annotations.
- Mysql-connect: allows connecting backend and database
- Json-simple: allows creating Json objects
- Hibernate: ORM service to handle data persistence in the MySQL database using annotations and to maintain a relational database formed by Java classes. Allows definition of EntityManagers





REST API

- **GET /game?gameId=x**: returns every step of the game with gameId x
- **POST /game** : saves all the steps of a new game in the database. The response contains the gameId used to save it
- **DELETE /game/gameId=x** : deletes all the record of the treasure hunt with gameId x. Used in debugging.
- **GET /games?initName=x** : returns gameId, gameName and number of steps for every treasure hunt that starts with x
- **DELETE /step?gameId=x&step=y** : deletes a record of a given game and deal with the step inconsistencies. Used in debug





04

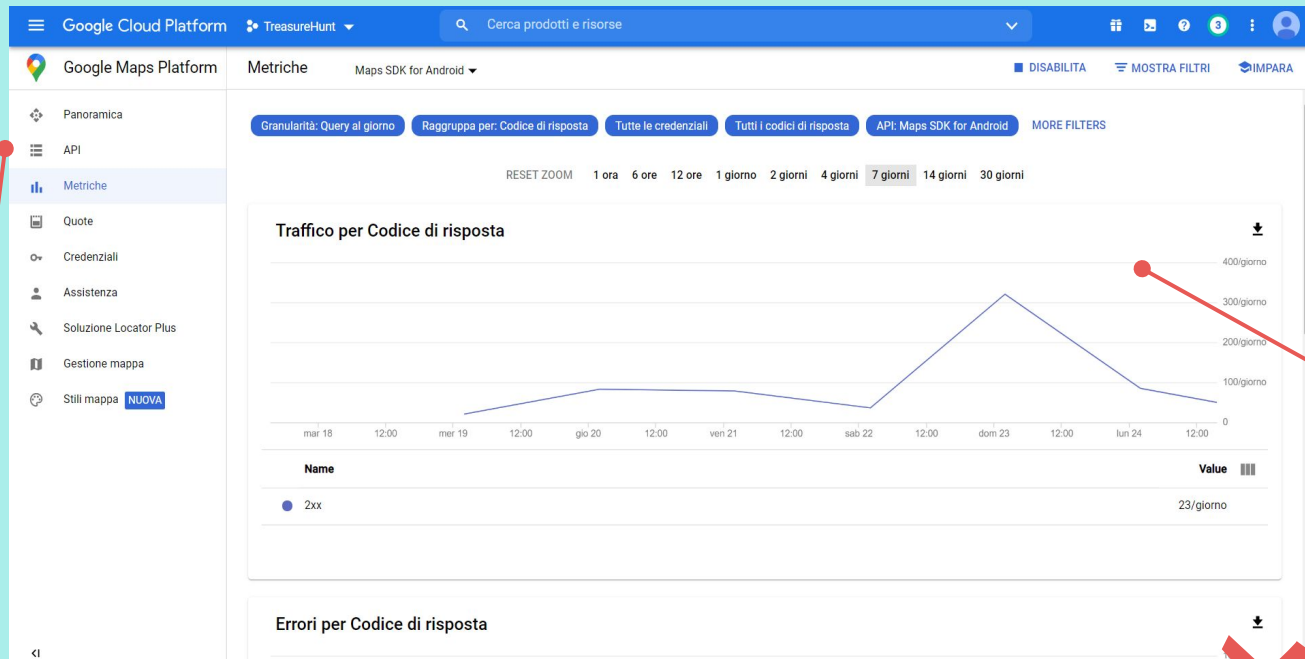
Location-based functionalities

Google map API
integration



Map setup and init

How to start using Google API

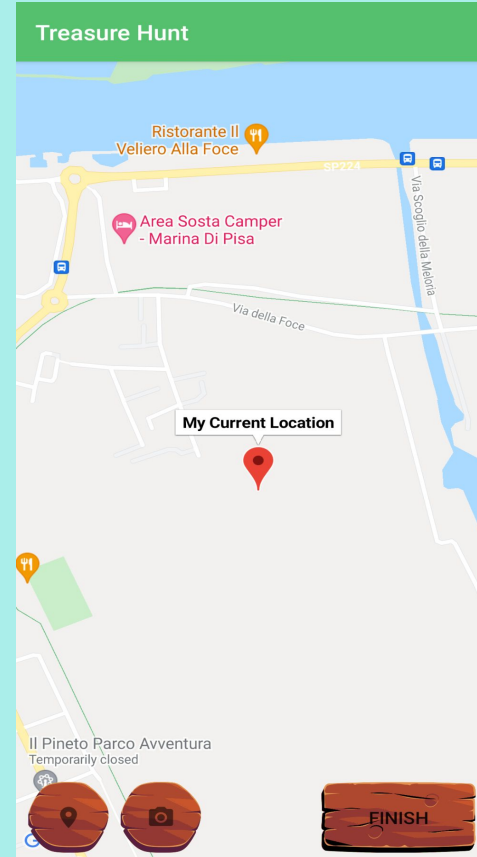


API ENABLING
AND KEY
ACTIVATION

ANALYTICS
AROUND
TRAFFIC RATE



Map Activity Initialization





Graphic recap of game steps



Location check



DIFFERENT LOCATION-BASED FEEDBACK ARE GIVEN:



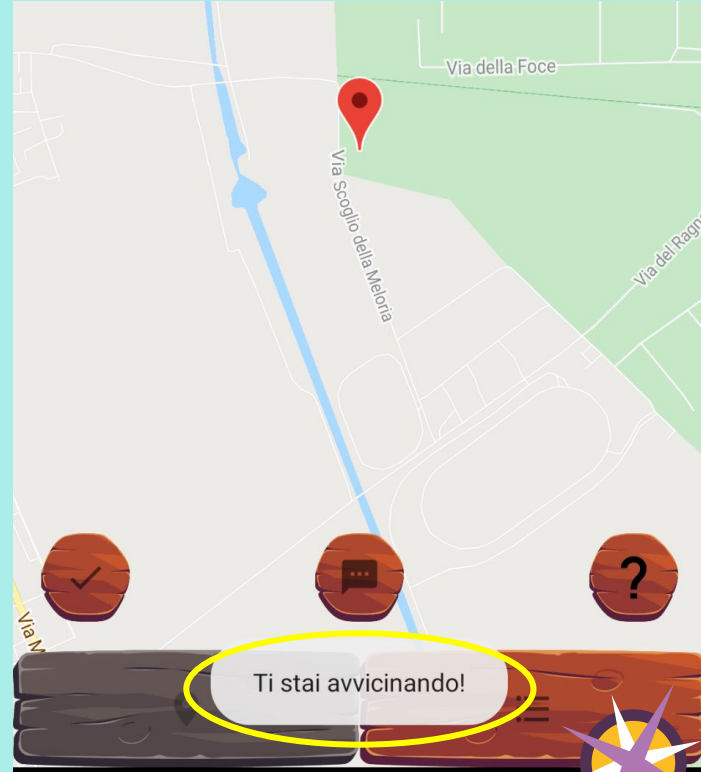
Very close (< 100m)



On the right way
(< 1 km)



On the wrong way



Location-based user support

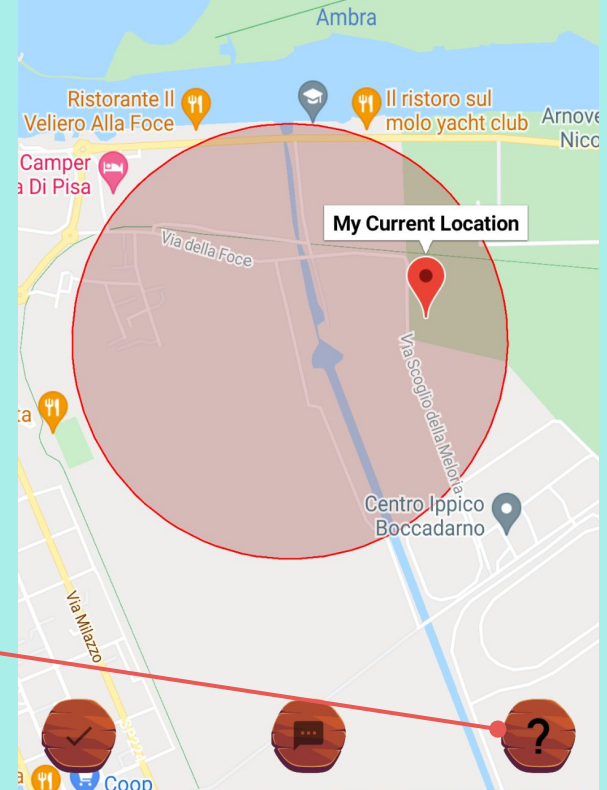


USER SUPPORT FOR LOCATION

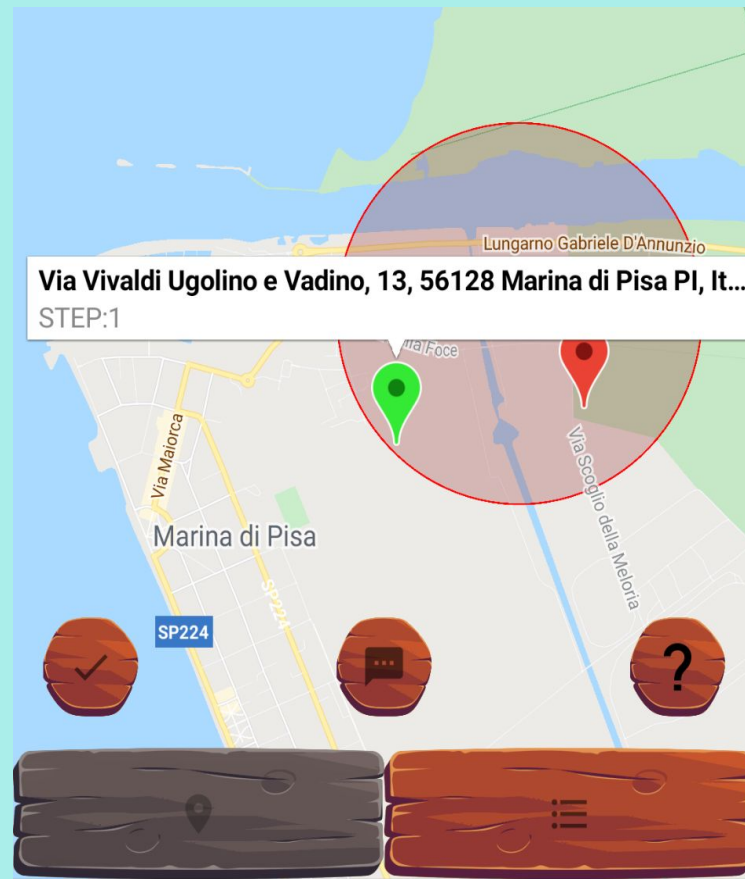
Whenever a user need support to find a location can use a hint and a red circle surrounding the target place is shown. Circle radius was set to be 500 meters long.



ON CLICK:
Area of interest
is displayed



Step completion





05

Machine-Learning functionalities

Google ML SDK for Mobile
integration



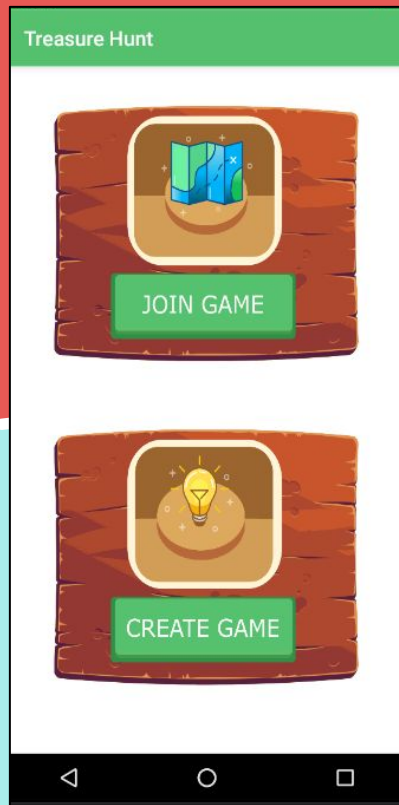


Material Design

Components: interactive building blocks for creating a user interface.

Experience: User flows, error handling.

Theming: Color, shape, typography.





ML KIT



Tensor Flow
Lite

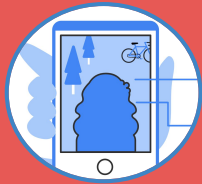
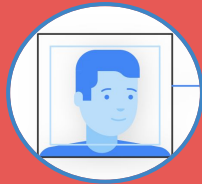
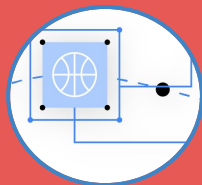


Android



iOS

Vision



Neural Language



Custom



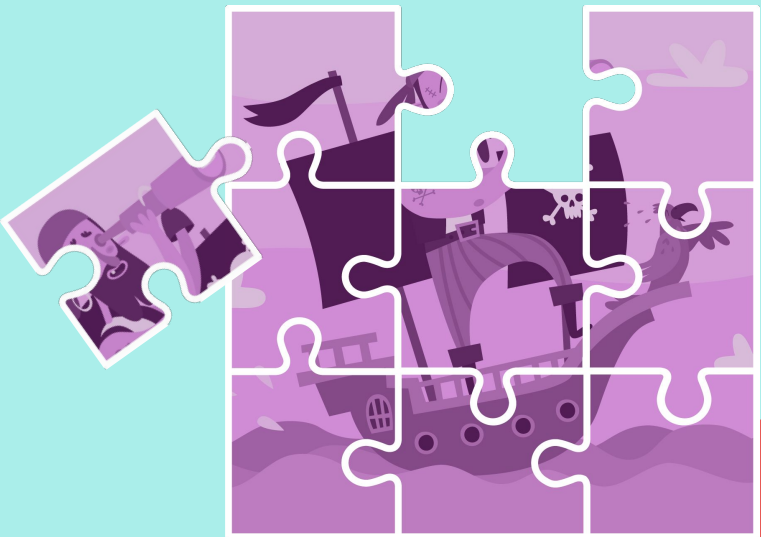


Machine Learning Kit

Vision APIs from google

Image labeling

1. Support more 400+ labels
2. Identify people, things, places, activities, etc



= boat



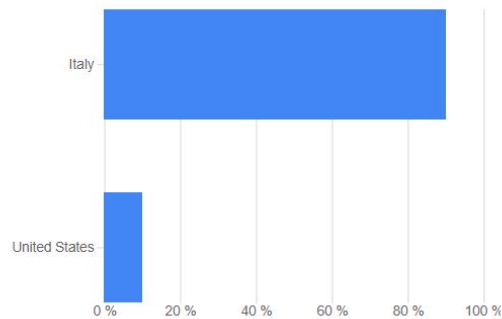
Google Analytics



Ubicación ⓘ



País/Región



Recuento de eventos
39



Usuarios ⓘ
3



Recuento por usuario ⓘ
13



Valor ⓘ
0



Usuarios activos ⓘ





Arrrrrrrrrr!!



You are going to love the game!!
Be the best pirate!!

