

```
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margin: const EdgeInsets  
child:  
label  
style
```



# Python for Machine Learning



[hasnatf](#)



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this presentation



Hasnat Ferdiananda  
IT practitioner, ex GITS



# Today's Topic

## AI in a Nutshell

- Definition
- Scope of AI
- Machine Learning

## Python in ML

- Python
- Library
- Hand-ons

```
Lookup.KeyValue
f.constant(['en'])
= tf.constant([
    lookup.StaticV
    _buckets=5)
```



# AI in a Nutshell

```
Lookup.KeyValue  
f.constant(['en  
=tf.constant([  
.lookup.StaticV  
_buckets=5)
```

# So.. What is AI? 8 Definitions, 4 Approaches

Thinking  
humanly

Acting  
humanly

Thinking  
rationally

Acting  
rationally

## Thinking Humanly

“The exciting new effort to make computers think . . . *machines with minds*, in the full and literal sense.” (Haugeland, 1985)

“[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning . . .” (Bellman, 1978)

## Thinking Rationally

“The study of mental faculties through the use of computational models.” (Charniak and McDermott, 1985)

“The study of the computations that make it possible to perceive, reason, and act.” (Winston, 1992)

## Acting Humanly

“The art of creating machines that perform functions that require intelligence when performed by people.” (Kurzweil, 1990)

“The study of how to make computers do things at which, at the moment, people are better.” (Rich and Knight, 1991)

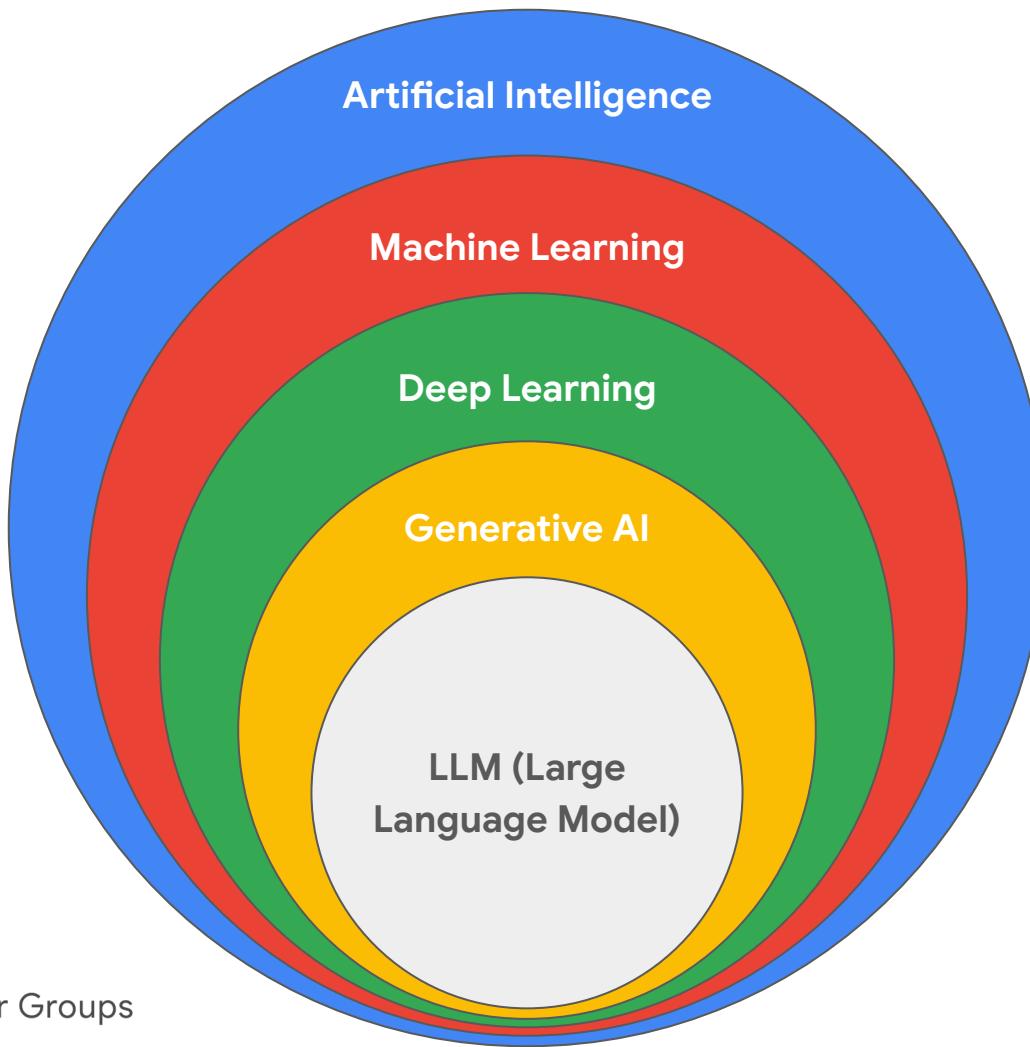
## Acting Rationally

“Computational Intelligence is the study of the design of intelligent agents.” (Poole *et al.*, 1998)

“AI . . . is concerned with intelligent behavior in artifacts.” (Nilsson, 1998)

**Figure 1.1** Some definitions of artificial intelligence, organized into four categories.

# Scope of AI



# What is Machine learning

Here is a slightly more general definition:

*[Machine Learning is the] field of study that gives computers the ability to learn without being explicitly programmed.*

—Arthur Samuel, 1959

And a more engineering-oriented one:

*A computer program is said to learn from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E.*

—Tom Mitchell, 1997



**Spam Filter**

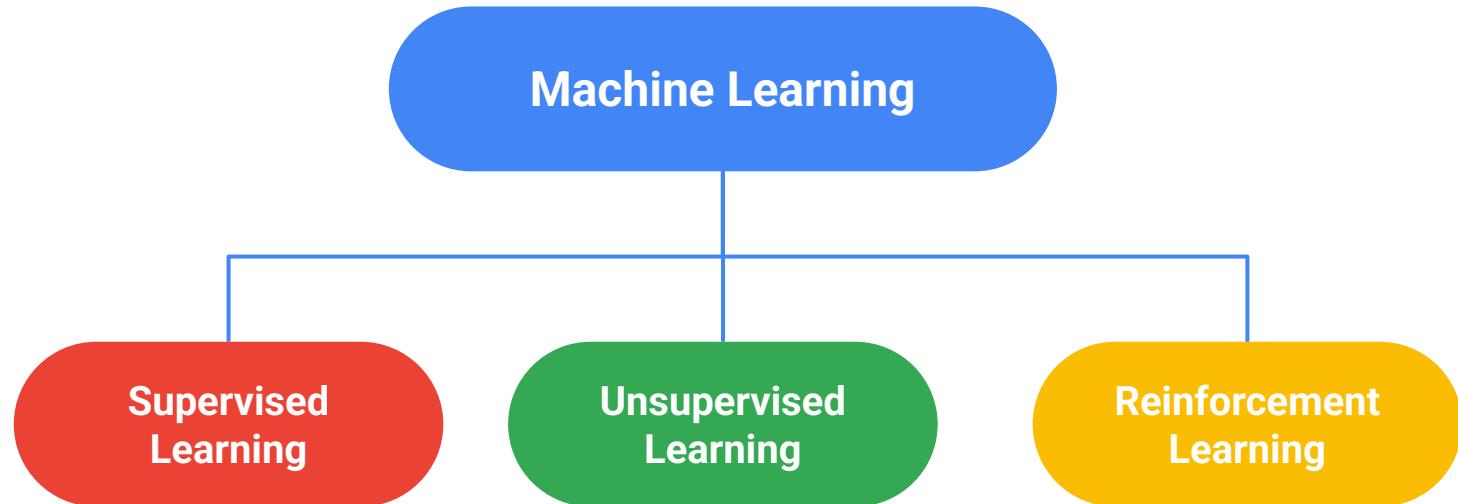


**Forecast Comp  
Revenue**

# ML Algorithms



# ML Type of Supervision



# Machine Learning Objective

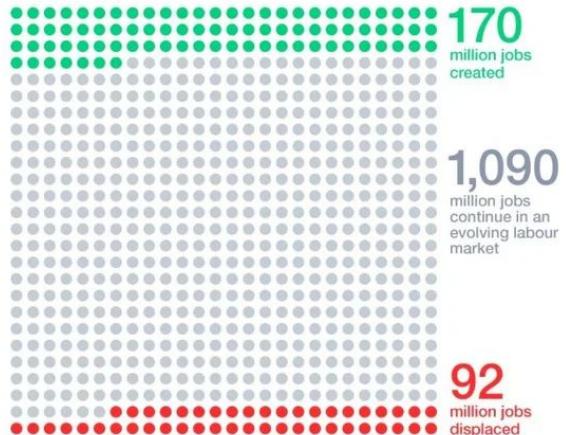
- Improve Revenue
  - Visibility in app search results
- Reduce Operational Cost
  - Email Extraction for Plane Ticket Rescheduling

Future of Jobs Report 2025

## Top 10 fastest growing skills by 2030

Future of Jobs Report 2025

### Total job growth and loss



1. AI and big data
2. Networks and cybersecurity
3. Technological literacy
4. Creative thinking
5. Resilience, flexibility and agility
6. Curiosity and lifelong learning
7. Leadership and social influence
8. Talent management
9. Analytical thinking
10. Environmental stewardship

Top fastest growing jobs

- 1 Big data specialists
- 2 FinTech engineers
- 3 AI and machine learning specialists
- 4 Software and applications developers
- 5 Security management specialists
- 6 Data warehousing specialists
- 7 Autonomous and electric vehicle specialists
- 8 UI and UX designers
- 9 Light truck or delivery services drivers
- 10 Internet of things specialists
- 11 Data analysts and scientists
- 12 Environmental engineers
- 13 Information security analysts
- 14 DevOps engineers
- 15 Renewable energy engineers



**AI is not a competitor.  
It is expensive. AI still  
requires humans as  
subject matter experts.**



tapi jangan terlalu advanced yaa, yang beginner friendly aja kalau mau  
ambahin kontennya

11:41 AM

# Python for ML

```
Lookup.KeyValue
f.constant(['en'])
= tf.constant([
lookup.StaticV
_buckets=5)
```

# Python?



Python is a popular programming language. It was created by Guido van Rossum, and released in 1991.

Python's streamlined syntax allows experts to spend more time working out solutions to complex ML issues rather than focusing on the language's complexity.

[https://www.w3schools.com/python/python\\_intro.asp](https://www.w3schools.com/python/python_intro.asp)

<https://www.turing.com/kb/why-python-is-widely-used-for-machine-learning>

# Library

Python libraries are collections of pre-written code and functions that extend the capabilities of the Python programming language.



Used to analyze data



Visualization utility



Machine learning



Used for working with arrays



Visualization utility



Deep learning



Google Developer Groups

# Library - Numpy



Used to process numerical data stored in arrays, such as: finding the mean, median, performing matrix calculations, and so on.

# Library - Pandas

It's a library built on top of other libraries like NumPy and Matplotlib, designed to assist in data analysis.

Pandas is versatile for data processing tasks, including: data cleaning, basic visualization, mathematical operations, creating dataframes, and encoding.

# Library - Pandas

## importing library

```
import pandas as pd
```

nama library

pd sebagai alias

## pendefinisan Series

```
series = pd.Series(data=[1, 2, 3, 4, 5, 6], name='angka')  
print(series)
```

```
0    1  
1    2  
2    3  
3    4  
4    5  
5    6  
Name: angka, dtype: int64
```

## pendefinisan DataFrame

```
df = pd.DataFrame(data={'angka': [4, 5, 6, 1, float('nan'), 3],  
                      'huruf': ['D', 'E', 'F', 'A', 'B', 'C']})  
  
print(df)
```

	angka	huruf
0	4.0	D
1	5.0	E
2	6.0	F
3	1.0	A
4	NaN	B
5	3.0	C

# Library - Pandas

1

menampilkan kolom

```
print(df.columns)
```

```
Index(['angka', 'huruf'], dtype='object')
```

2

menampilkan 5 data teratas

```
print(df.head(5))
```

	angka	huruf
0	4.0	D
1	5.0	E
2	6.0	F
3	1.0	A
4	NaN	B

3

menampilkan 3 data terbawah

```
print(df.tail(3))
```

	angka	huruf
3	1.0	A
4	NaN	B
5	3.0	C

4

menampilkan informasi dari data

```
print(df.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype  
 ---  --     --             --    
 0   angka    5 non-null      float64
 1   huruf    6 non-null      object  
dtypes: float64(1), object(1)
memory usage: 224.0+ bytes
```

5

menampilkan null value

```
print(df.isna())
```

	angka	huruf
0	False	False
1	False	False
2	False	False
3	False	False
4	True	False
5	False	False

6

menampilkan total null value

```
print(df.isna().sum())
```

	angka	huruf
	1	0

dtype: int64



# Library - Pandas

## 7 memeriksa data duplikat

```
▶ print(df.duplicated())
```

```
▷ 0    False  
  1    False  
  2    False  
  3    False  
  4    False  
  5    False  
dtype: bool
```

## 8 memeriksa jumlah data duplikat

```
▶ print(df.duplicated().sum())
```

```
▷ 0
```

## 9 mengurutkan data by kolom tertentu

```
▶ print(df.sort_values(by='angka'))
```

```
▷ angka  huruf  
  3    1.0    A  
  5    3.0    C  
  0    4.0    D  
  1    5.0    E  
  2    6.0    F  
  4    NaN    B
```

## 10 menghapus nilai by indeks

```
▶ df.drop(index=1, inplace=True)
```

```
print(df)
```

```
▷      angka  huruf  
  0    4.0    D  
  2    6.0    F  
  3    1.0    A  
  4    NaN    B  
  5    3.0    C
```

## 11 mengatur ulang indeks

```
▶ df.reset_index(drop=False, inplace=True)
```

```
print(df)
```

```
▷      index  angka  huruf  
  0        0    4.0    D  
  1        2    6.0    F  
  2        3    1.0    A  
  3        4    NaN    B  
  4        5    3.0    C
```

## 12 mengatur ulang indeks

```
▶ df.reset_index(drop=True, inplace=True)
```

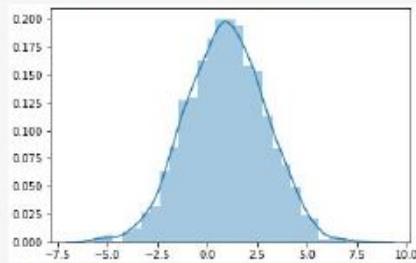
```
print(df)
```

```
▷      angka  huruf  
  0    4.0    D  
  1    6.0    F  
  2    1.0    A  
  3    NaN    B  
  4    3.0    C
```

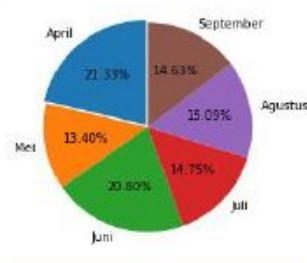


# Library - Matplotlib & Seaborn

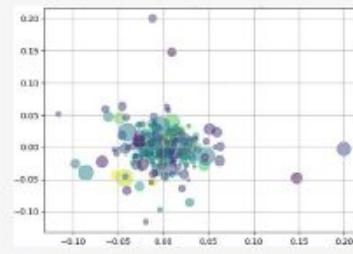
Both can be used to visualize data in many different ways, including:



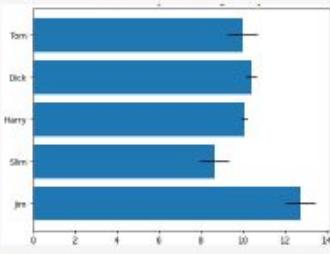
distribution plot



pie plot



scatter plot



bar-h plot

Seaborn is essentially built on top of Matplotlib, allowing for their combined use.



# Library - Matplotlib & Seaborn

**So, what is the purpose of data visualization? Is it always required?**

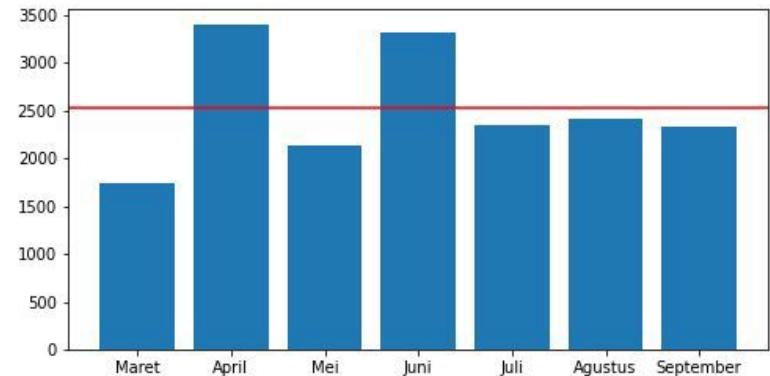
While data visualization isn't strictly necessary, it's often essential for making data understandable. It allows anyone to grasp the information without having to sift through countless rows and columns.



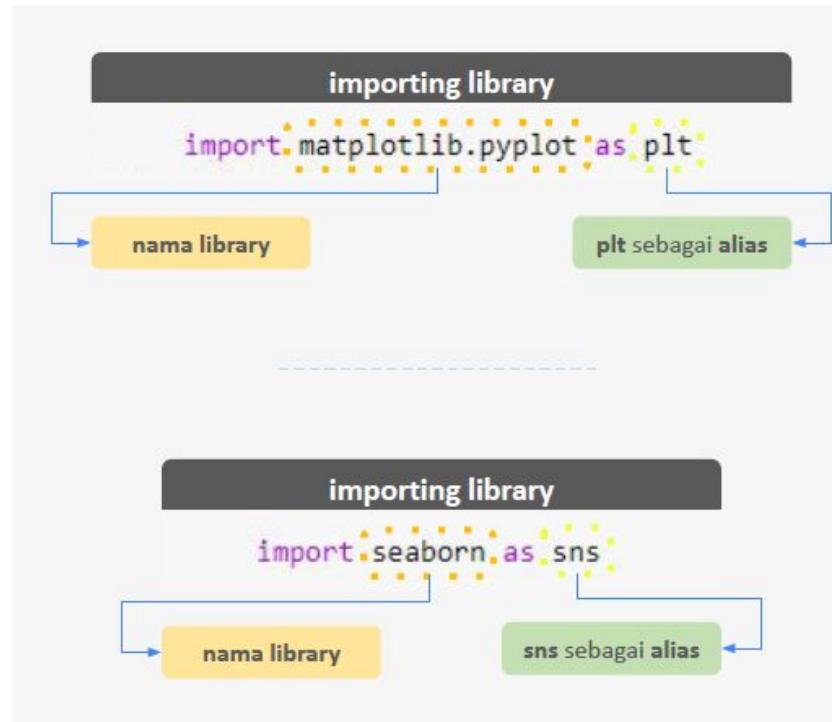
# Library - Matplotlib & Seaborn

Bulan	Kasus Positif Harian
Maret	1741
April	3397
Mei	2134
Juni	3314
Juli	2349
Agustus	2404
September	2331

OR



# Library - Matplotlib & Seaborn



# Library - Scikit-learn

This module is designed to help with data processing and training data for machine learning or data science applications.

Scikit-learn is an open source machine learning library that supports supervised and unsupervised learning. It also provides various tools for model fitting, data preprocessing, model selection, model evaluation, and many other utilities.

# Hands-on



Google Colab

# Task:

Explore & visualize **your own**  
**data** using Google Colab



Google Developer Groups

# The end of this session, Any question guys?

Let's connect and collaborate

Email: [ferdianandahasnat@gmail.com](mailto:ferdianandahasnat@gmail.com)

Personal Page: <https://hasnat.vercel.app/>

LinkedIn: <https://www.linkedin.com/in/hasnatf/>

Instagram: [@hasnat5](https://www.instagram.com/@hasnat5)



Scan to download this  
presentation

```
/*1*/  
child: Column(  
crossAxisAlignment: CrossAxisAlignment  
children: [  
/*2*/  
Container(  
padding: const EdgeInsets.all(16),  
child: const Text(  
'Oeschinen Lake Campg  
style: TextStyle(  
fontWeight: FontWeight.w600),  
,  
,  
)  
,
```



Buat nemenin akhir pekan

[soulmi.com/chat](https://soulmi.com/chat)

# Speaker Presentation Template



**Google Blue 500**  
#4285f4



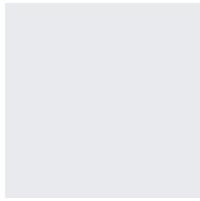
**Google Red 500**  
#ea4335



**Google Yellow 500**  
#fbbbc04



**Google Green 500**  
#34a853



**Google Grey 200**  
#e8eaed



**Google Grey 900**  
#202124

## Headlines

**Google Sans Bold**

## Subheads

Roboto Mono Light

## Body

Google Sans Normal



Google Developer Groups

```
ldren: [  
con(icon, color: color  
ontainer(  
margin: const EdgeInsets  
child:  
label  
style
```



# Topic of the Event



FirstName LastName  
Title, Company

```
ldren: [  
con(icon, color: color  
ontainer(  
margin: const EdgeInsets  
child:  
label  
style
```



# Topic of the Event



FirstName LastName  
Title, Company

```
ldren: [  
con(icon, color: color  
ontainer(  
margin: const EdgeInsets  
child:  
label  
style:
```



# Topic of the Event

LOGO

LOGO

LOGO

FirstName LastName  
Title, Company



```
ldren: [  
con(icon, color: color  
ontainer(  
margin: const EdgeInsets  
child:  
label  
style:
```



# Topic of the Event



FirstName LastName  
Title, Company



# This is an example of section title slide

```
Lookup.KeyValue
f.constant(['en
=tff.constant([
.lookup.StaticV
buckets=5)
```



# This is an example of section title slide

```
Lookup.KeyValue  
f.constant(['em  
=tf.constant([0  
.lookup.StaticV  
_buckets=5)
```



# This is an example of section title slide

```
Lookup.KeyValue  
f.constant(['en  
=tf.constant([  
.lookup.StaticV  
_buckets=5)
```



# This is an example of section title slide

```
Lookup.KeyValue
f.constant(['en
=tff.constant([
.lookup.StaticV
buckets=5)
```

```
/*
  child: Column(
    crossAxisAlignment: CrossAxisAlignment,
    children: [
      /*2*/
      Conta
      pad
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      's
    )
  ),
  Text(
    'Ka
    sty
    c
  ),
),
1
```

**“Simple statement, URL or  
quote goes here. Limit text  
to four lines or less.”**

**Simple quote or  
statement goes here.  
Ideally limit to four or  
five lines max.**





```
ldren: [  
con(icon, color: color  
ontainer(  
margin: const EdgeInsets  
child: Text(  
label:  
style:
```



**Simple quote or statement goes here.  
Ideally limit to four or five lines max.**



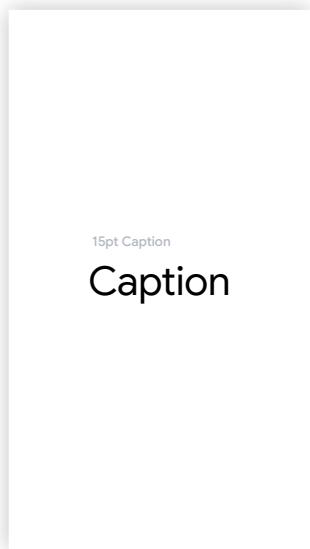


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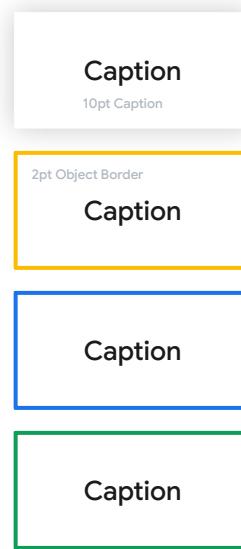
**Simple quote or  
statement goes here.  
Ideally limit to four or  
five lines max.**

# Chart Elements

## Large Box



## Medium Box

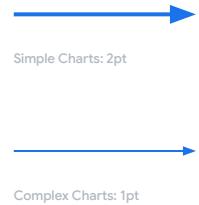


## Small Box

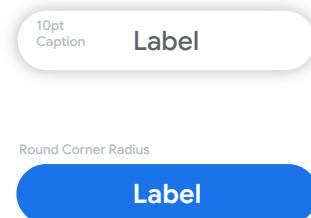
Use for nested items only



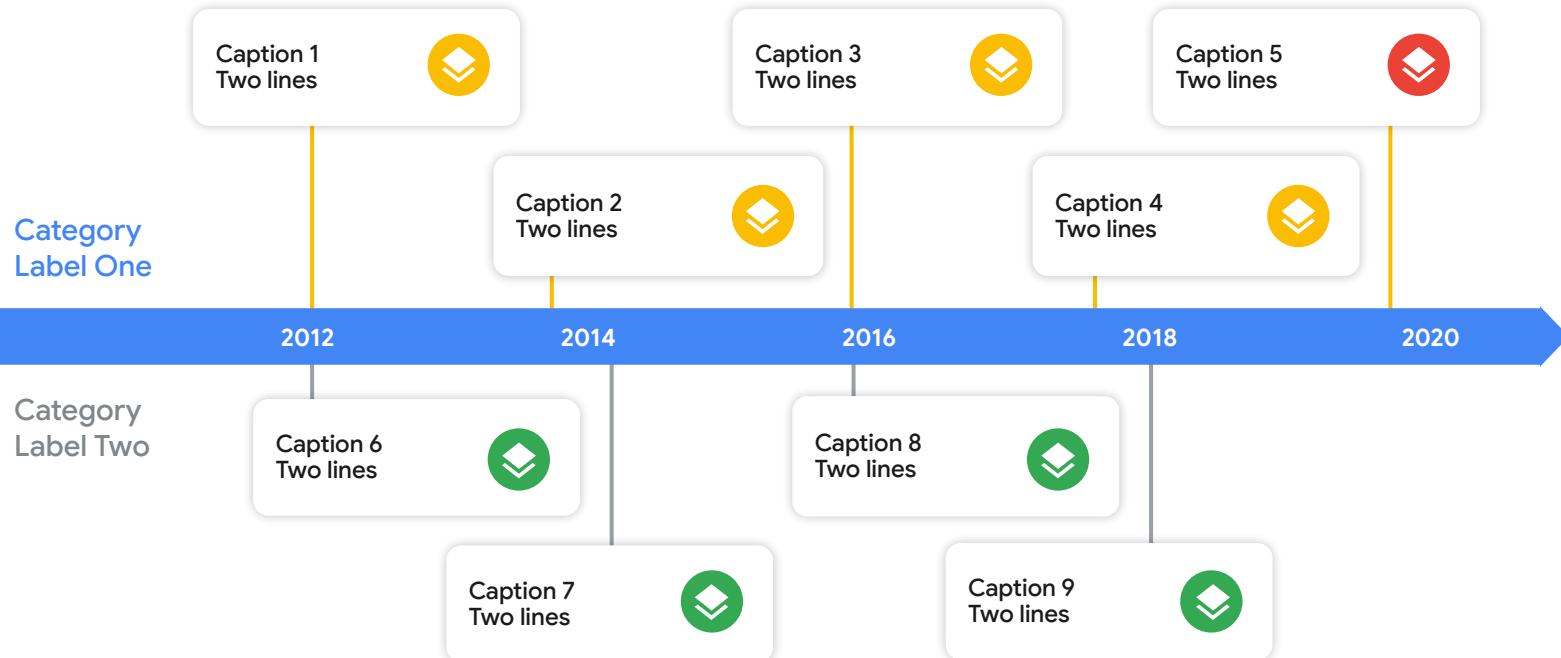
## Arrows



## Labels

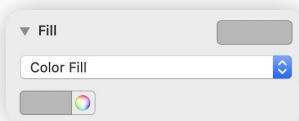


# Chart Title



# Icons

All icons are vector objects and can be recolored using the fill menu.



Accessibility



Expand



Late



Credit card



Extension



Thumb Up



Remove



Verified



Q&A



Finance



Android



Turn in



Trash



Actions



Download



History



Store



List



Wallet



Announcement



Backup



Document



Favorite 1



Open



Home



Print



Swap



Account



Ratio



Tag



Server



Favorite 2



Grade/rate



Lock



Language



Receipt



Add shopping



Chart



Bug



Event



Find Page



Page view



Basket



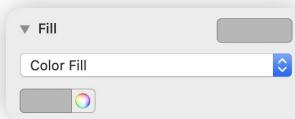
Time



Work

# Icons

All icons are vector objects and can be recolored using the fill menu.



Alarm



Assessment



Sync



Exit App



Movie



Visibility



Trolley



Open



Location



Settings



Assignment



Check



Explore



Thumb Down



Today



Perm Media



People



search



Airplane



Signal



Photo



Play 1



Block



Send



Smartphone



Style



Walk



Bluetooth



WiFi



Upload



Play 2



Email



Laptop



iPhone



Controls



Bike



Pie Chart



Money



Attachment



Video



Business



Chromebook



Security



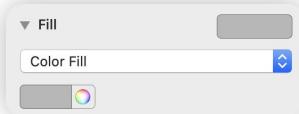
Notification



Bus

# Icons

All icons are vector objects and can be recolored using the fill menu.



Developer



Write



Cloud



Audio



Key



Desktop Mac



Watch



Person



Car



Devices



Quote



Folder



Web Page



Archive



Desktop PC



Flag



World



Boat



Software



Emotion



Mic



Call



Cut



headphones



Camera



Education



Train



Weather



Link



Movie



Chart



Paste



Keyboard



TV



MMS



Subway



Hotel



Laundry



Location History



Layers



Offer



Map



Bar



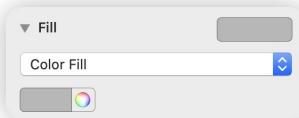
Pizza



Web

# Icons

All icons are vector objects and can be recolored using the fill menu.



Cafe



Theatre



Gaming



Florist



Restaurant



Gas



Delivery



Hospital



Taxi



Print



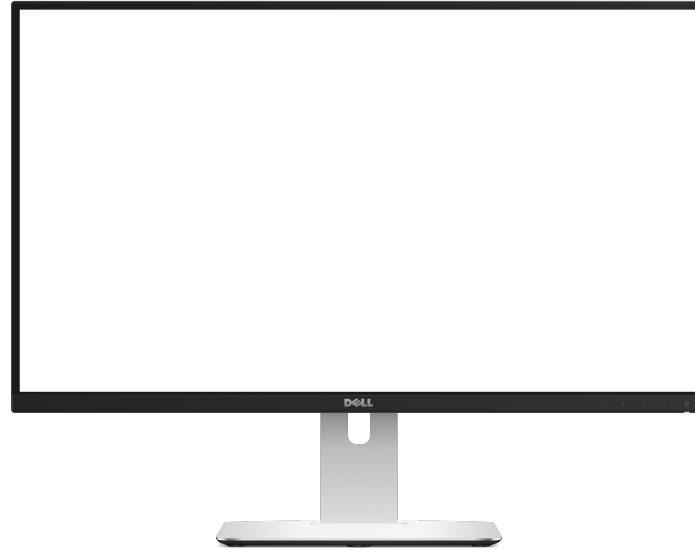
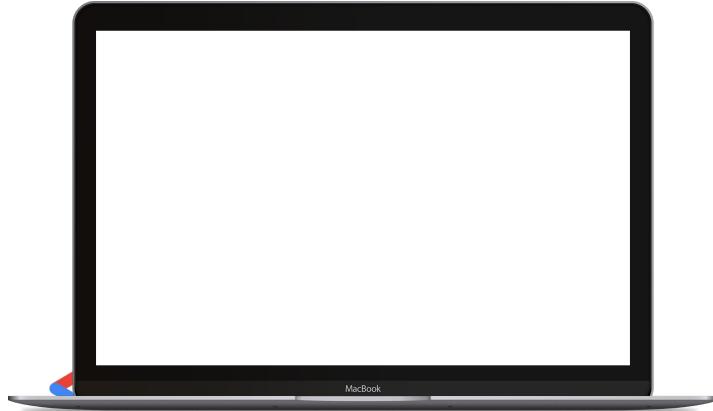
Radio



Stream



# Device Library



# Logo Library

Logos can be scaled to any size

