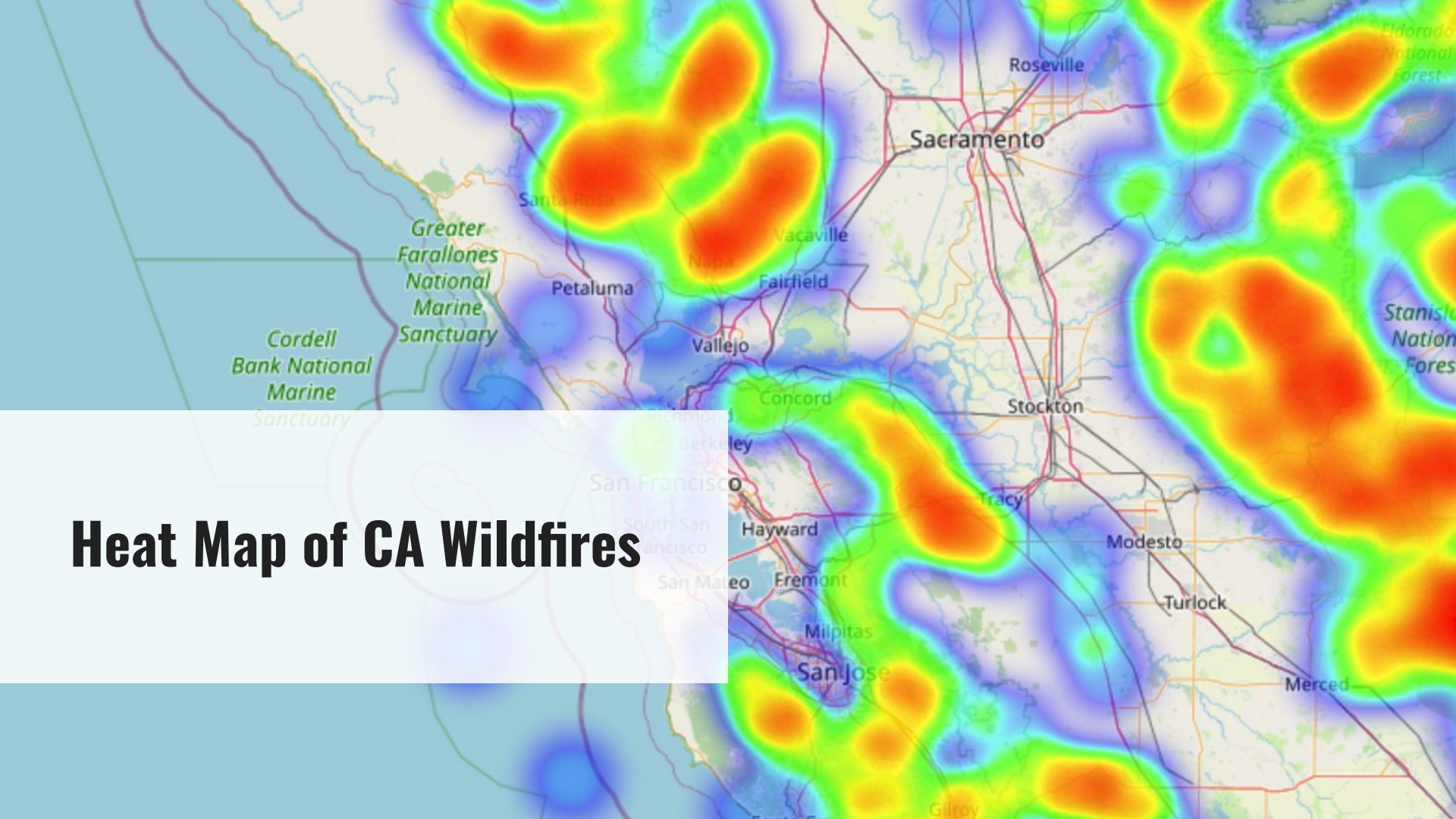
Wildfires in California

Francisco, Hannah, Josh, Pan, Pauline

OVERVIEW

- Increased intensity due to human-induced climate change
- Drastic rise in environmental, economic, and social costs due to wildfires

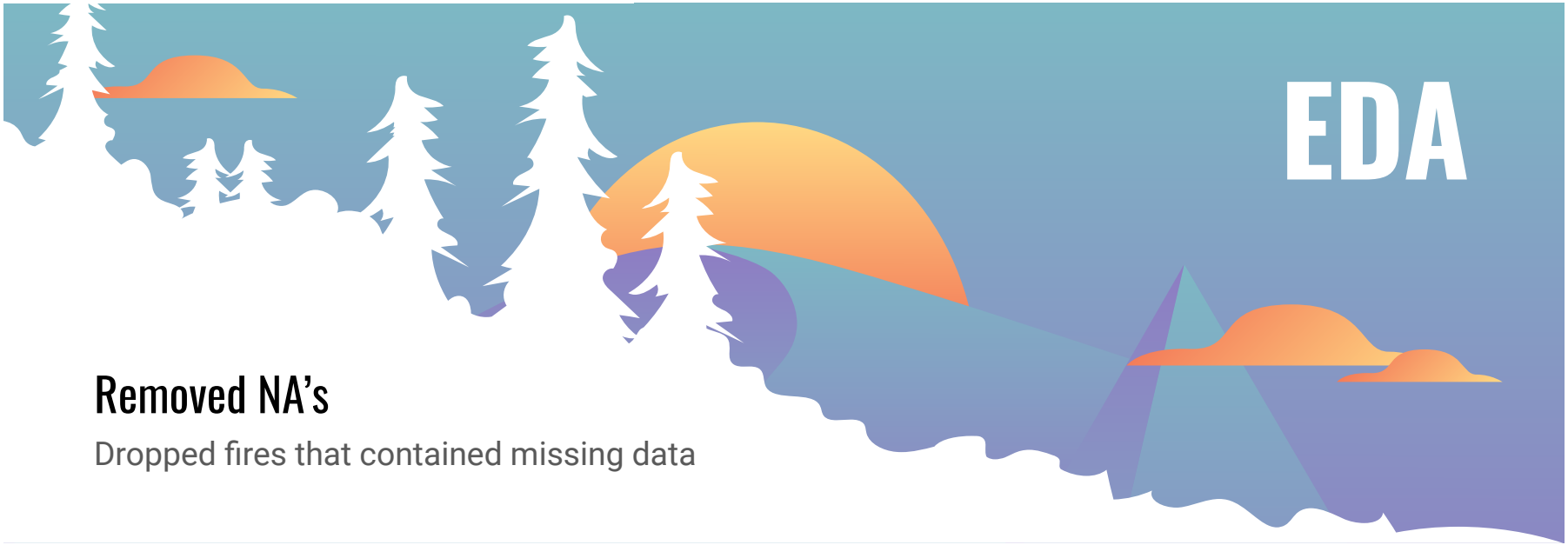
4 MILLION+ ACRES
in 2020



Heat Map of CA Wildfires

Research Question

Can we predict wildfire size based on weather elements 14 days prior and after the start of a wildfire?



Removed NA's

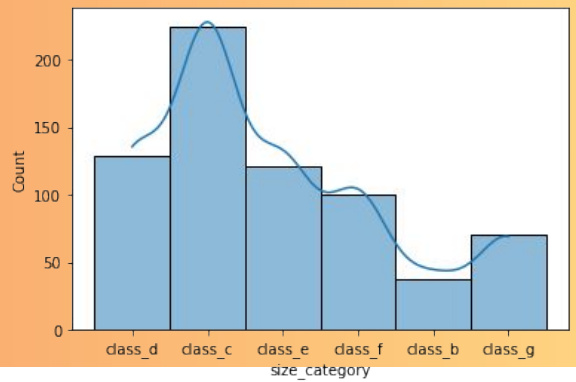
Dropped fires that contained missing data

Aggregated Data

Averaged hourly data over a 24 hr period for each feature

NAIVE BAYES

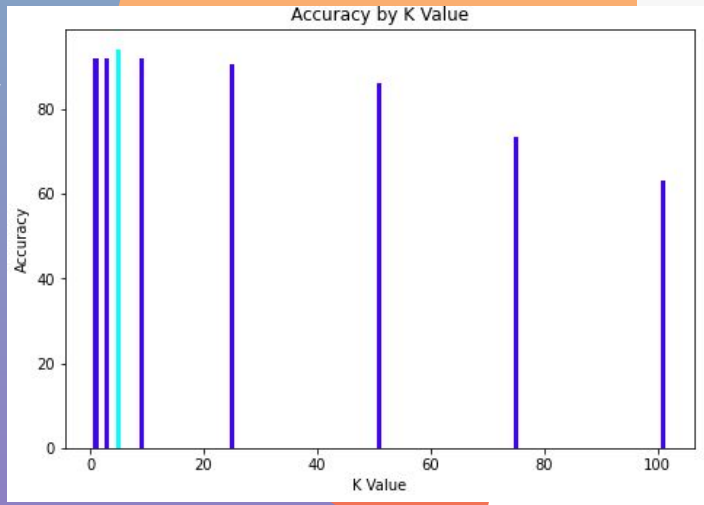
Models	F1 Score	Fits
BernoulliNB	0.29	Binary Features❌
GaussianNB	0.55	Normally Distributed Classes❌
CategoricalNB	0.94	Discrete Features✔️
MultinomialNB	0.82	Discrete Features✔️



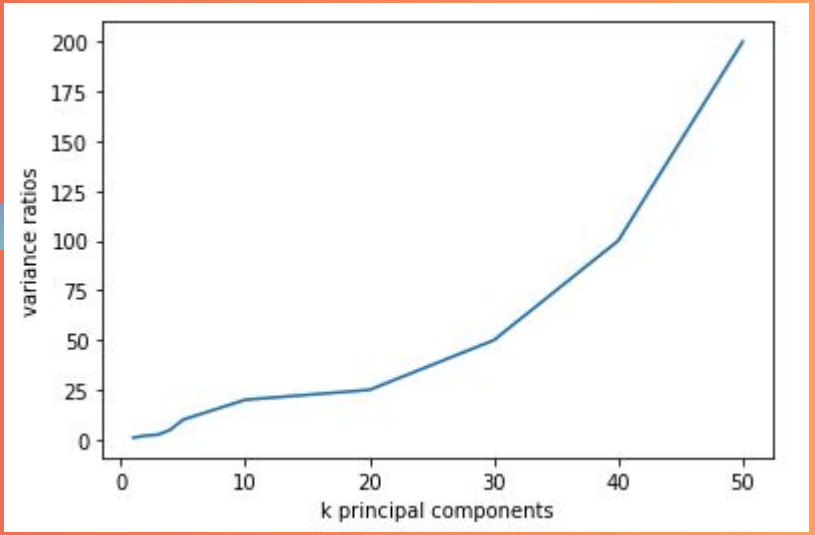
K NEAREST NEIGHBORS

- The K Nearest Neighbors model is non-linear and works well with classes
- The training data contains about 400 points, so it is understandable that K Values of 75 and 100 would produce relatively low accuracy scores, since they are classifying by using a large fraction of the data
- Best: 5 KNN with 94.11% accuracy

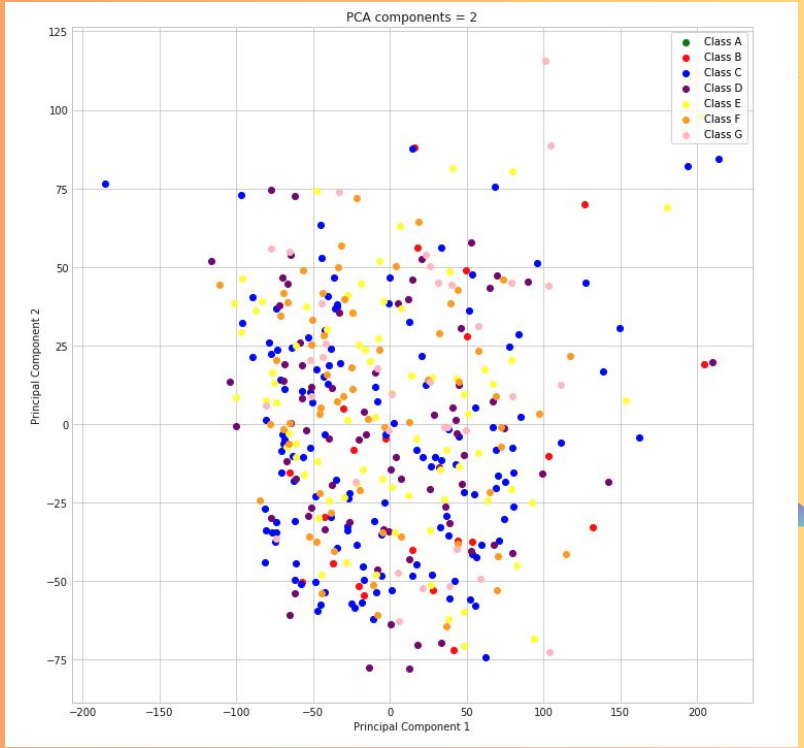
K Values	Scores
5	94.117647
1	91.911765
3	91.911765
9	91.911765
25	90.441176
51	86.029412
75	73.529412
101	63.235294



PCA



k components = [1, 2, 3, 4, 5, 10, 20, 30, 40, 50]

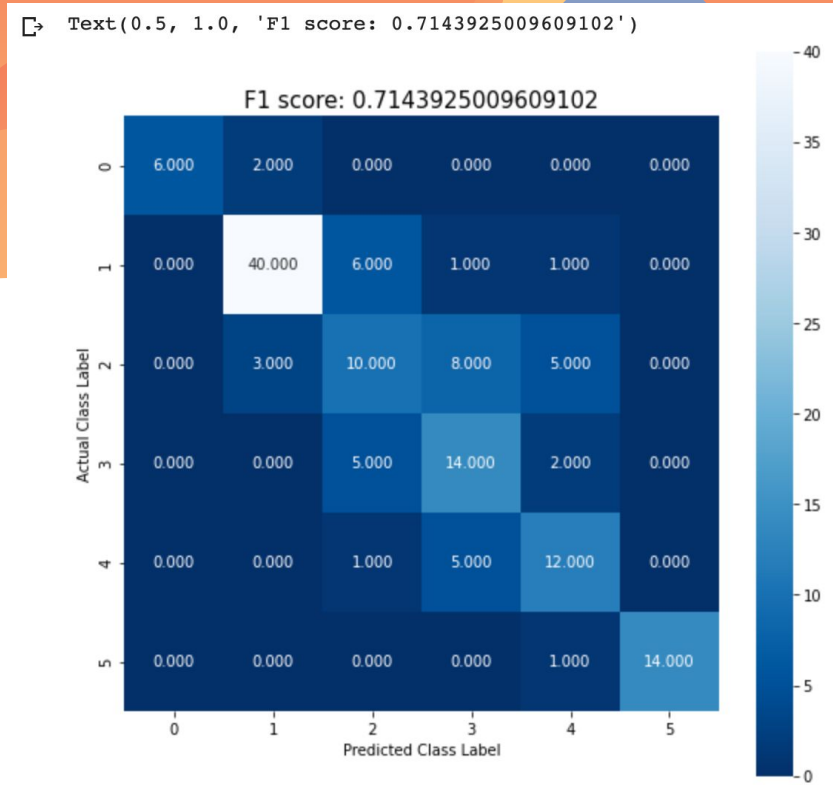


PCA with 2 principal components

LOGISTIC REGRESSION

- Now we'll use Multinomial Logistic Regression to model the probability of a certain fire size class.

- Our main findings were:
  - The optimal value for C is 7.0.
  - F1 score for a Logistic Regression classifier using the optimal value for C: 0.7144.



LINEAR REGRESSION

Use All Features

No manipulation was done on the feature space

Negative R^2

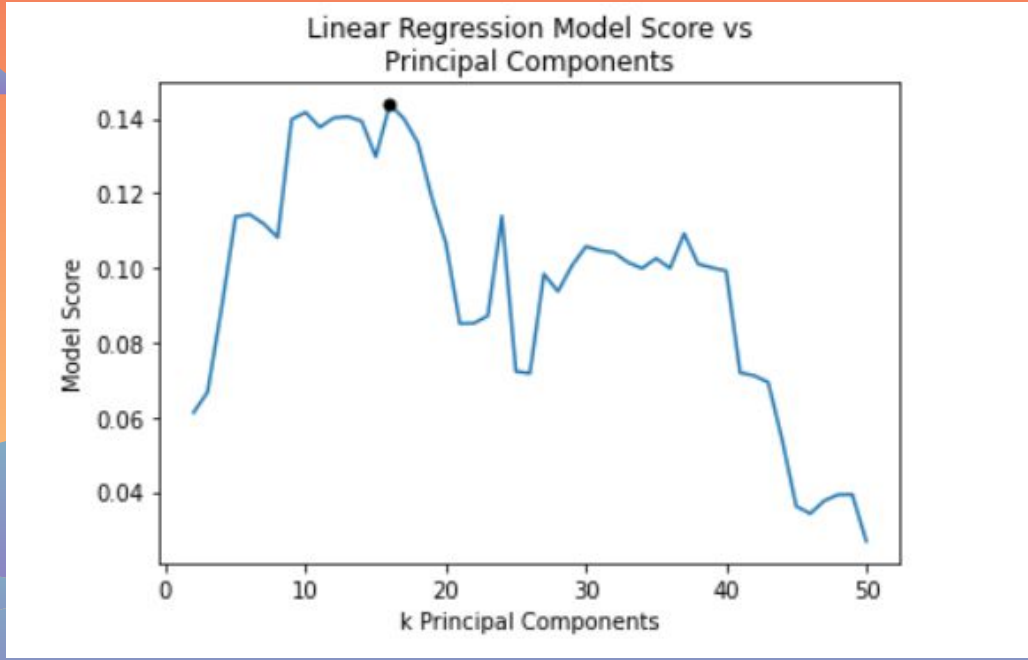
Can't capture variation in the dataset

	log_sizes	predicted
0	8.052615	3.815292
1	5.521461	5.127927
2	5.802118	6.329192
3	4.983607	3.508105
4	4.700480	0.045942
...	...	...
131	4.290459	5.277446
132	3.970292	5.545927
133	7.293018	2.325221
134	3.332205	4.941196
135	1.791759	9.273558

136 rows × 2 columns

First Model

LINEAR REGRESSION: PCA



LINEAR REGRESSION

Reduce Feature Space

Use PCA with 16 components

Improved R^2

Model captures about 14.38% of variation ($R^2 = 0.1438$)

	log_sizes	predicted
0	8.052615	4.591681
1	5.521461	5.165711
2	5.802118	8.600421
3	4.983607	3.921614
4	4.700480	4.268586
...	...	...
131	4.290459	4.482017
132	3.970292	4.442077
133	7.293018	3.823545
134	3.332205	5.873307
135	1.791759	4.584004

136 rows × 2 columns

First Model

BEST PERFORMING MODELS

Categorical Naive Bayes

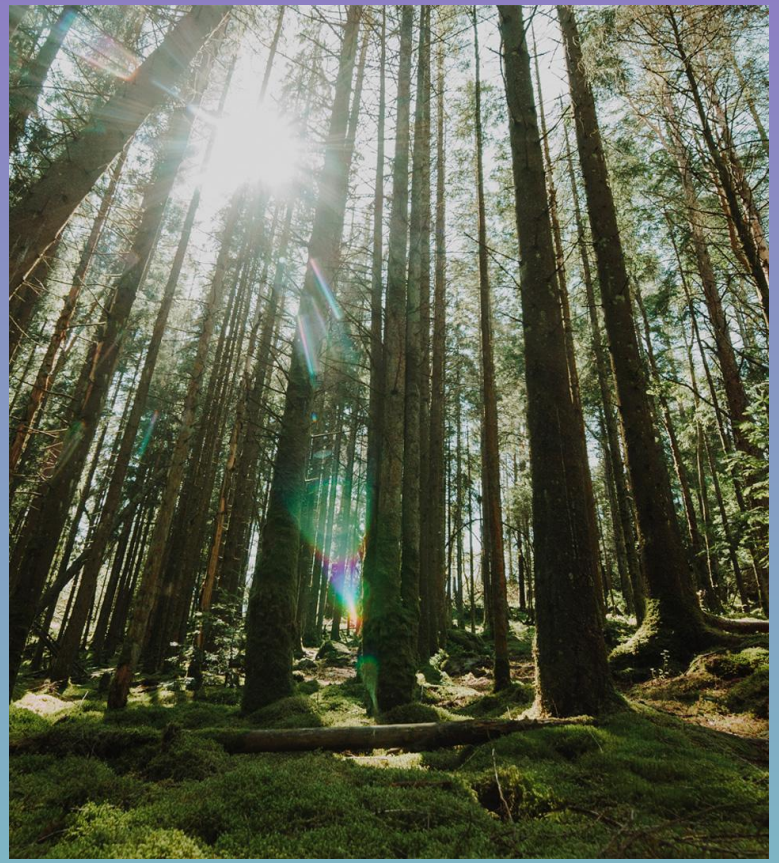
Produces 94% accuracy

KNN

Nearest Neighbor Value of 5 produces 94.1% accuracy

What We Learned

- We are able to predict with fairly high accuracy wildfire size based on weather elements 14 days before and after the start of the fire
- This information can be highly useful in containing fires
- However, human actions are necessary to reduce the increasingly harmful effects of climate change



THANK YOU

Any questions?

THANKS

DOES ANYONE HAVE ANY QUESTIONS?

addyouremail@freepik.com
+91 620 421 838
http://yourcompany.com/

DO YOU NEED TO DIVIDE THE CONTENT?

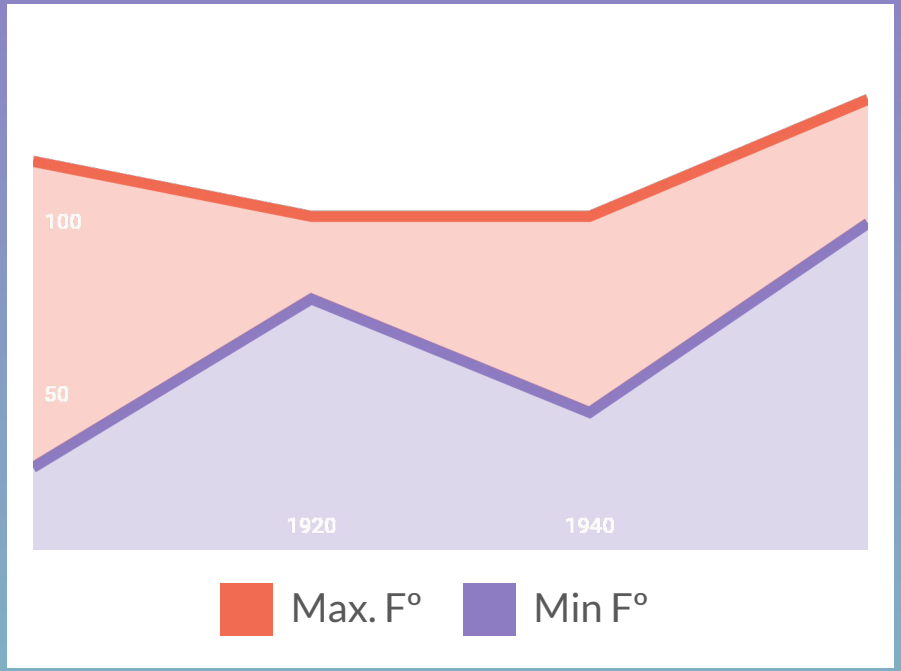
MERCURY

Mercury is the closest planet to the Sun and the smallest one

VENUS

Venus has a beautiful name and is the second planet from the Sun

THIS IS A GRAPH



REPLACE IT

To modify this graph, click on it, follow the link and change the data. Then paste the new graph here

SOMETIMES, REVIEWING CONCEPTS IS A GOOD IDEA

MERCURY

Mercury is the closest planet to the Sun

VENUS

Venus has a beautiful name, but it’s terribly hot

MARS

Despite being red, Mars is actually a cold place

JUPITER

It’s the biggest planet in the Solar System

SATURN

Saturn is the ringed one and a gas giant

NEPTUNE

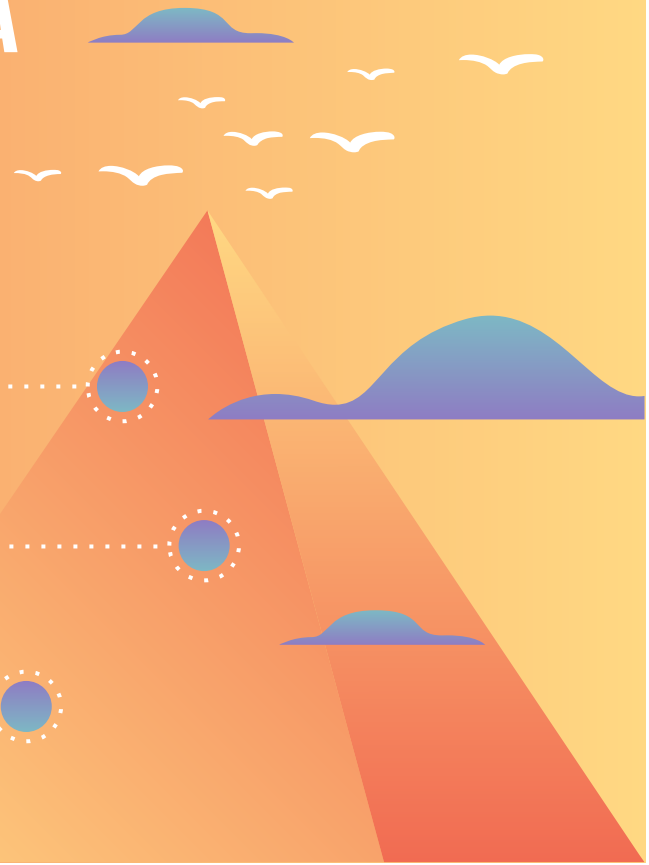
Neptune is the farthest planet from the Sun

INFOGRAPHICS MAKE YOUR IDEA UNDERSTANDABLE

Mercury is the closest planet

Jupiter is the biggest planet

Venus is terribly hot



Instructions for use

In order to use this template, you must credit **Slidesgo** by keeping the **Thanks** slide.

You are allowed to:

- Modify this template.
- Use it for both personal and commercial projects.

You are not allowed to:

- Sublicense, sell or rent any of Slidesgo Content (or a modified version of Slidesgo Content).
- Distribute Slidesgo Content unless it has been expressly authorized by Slidesgo.
- Include Slidesgo Content in an online or offline database or file.
- Offer Slidesgo templates (or modified versions of Slidesgo templates) for download.
- Acquire the copyright of Slidesgo Content.

For more information about editing slides, please read our FAQs or visit Slidesgo School:

https://slidesgo.com/faqs and https://slidesgo.com/slidesgo-school

Fonts & colors used

This presentation has been made using the following fonts:

Archivo Black
(https://fonts.google.com/specimen/Archivo+Black)

Lato Regular
(https://fonts.google.com/specimen/Lato)

#333333 #ffffff #ffd983 #f16b52 #7db8c4 #8e7cc3

Stories by Freepik

Create your Story with our illustrated concepts. Choose the style you like the most, edit its colors, pick the background and layers you want to show and bring them to life with the animator panel! It will boost your presentation. Check out How it Works.

Pana

Amico

Bro

Rafiki

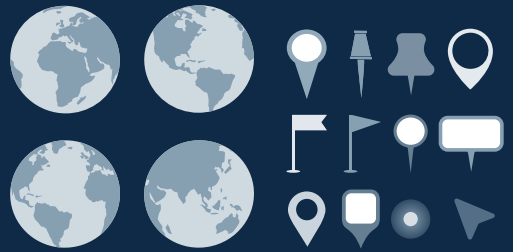
Cuate

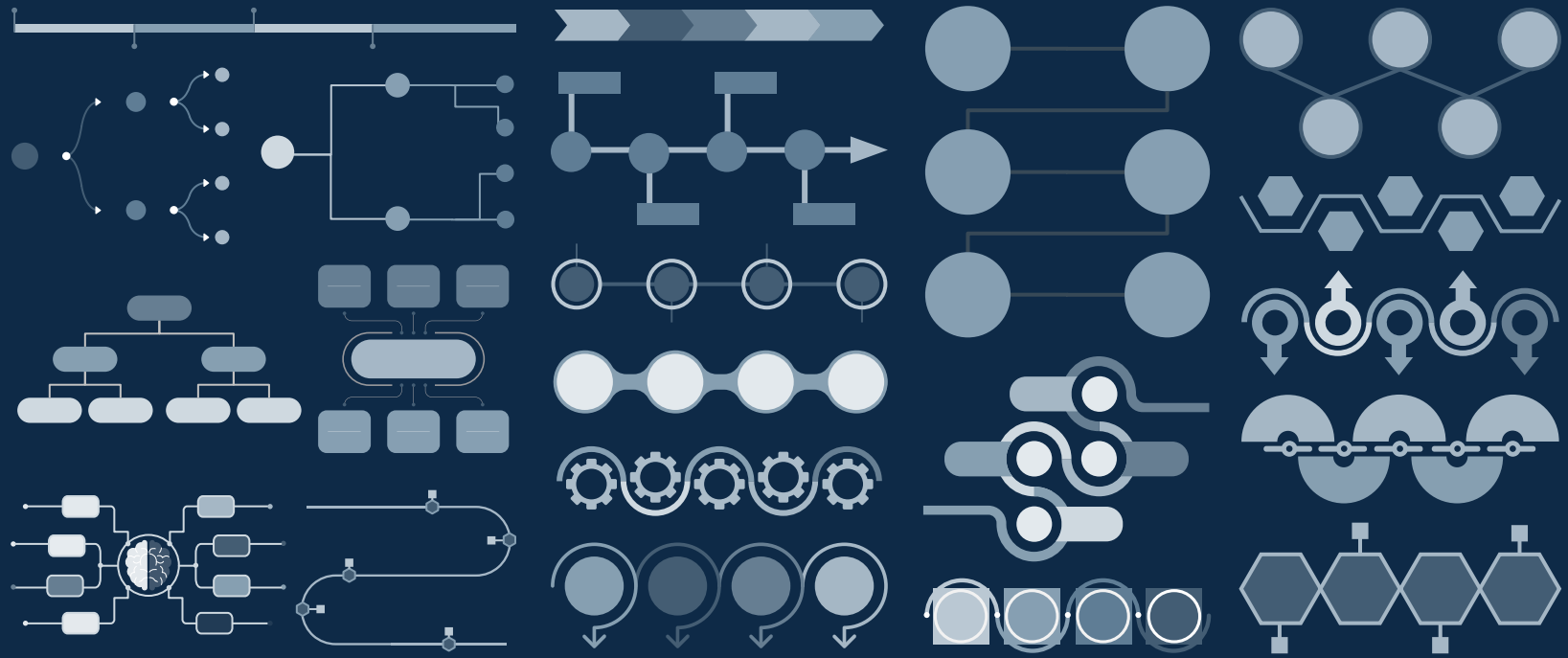
Use our editable graphic resources...

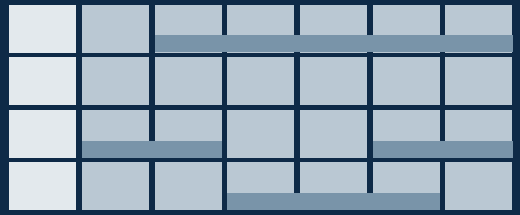
You can easily resize these resources without losing quality. To change the color, just ungroup the resource and click on the object you want to change. Then, click on the paint bucket and select the color you want. Group the resource again when you're done. You can also look for more infographics on Slidesgo.

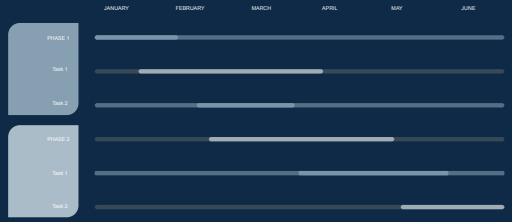


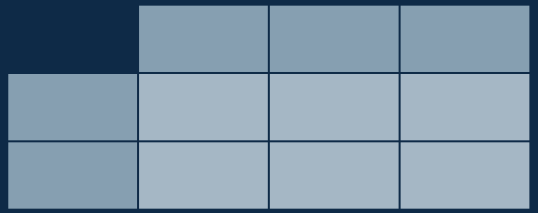


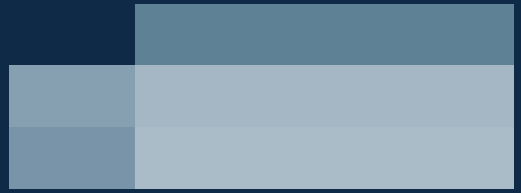



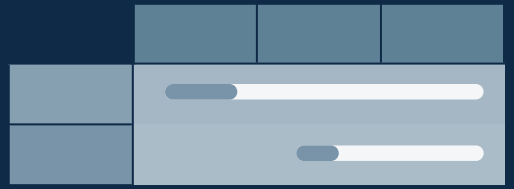


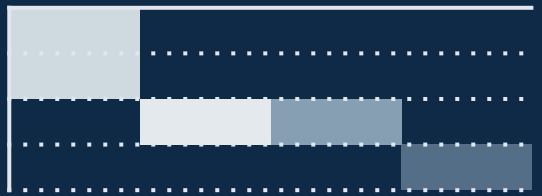


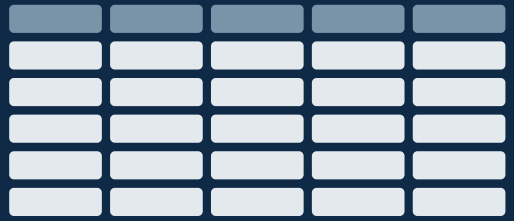

JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
PHASE 1
Task 1
Task 2
PHASE 2
Task 1
Task 2

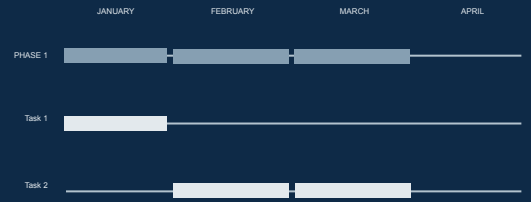


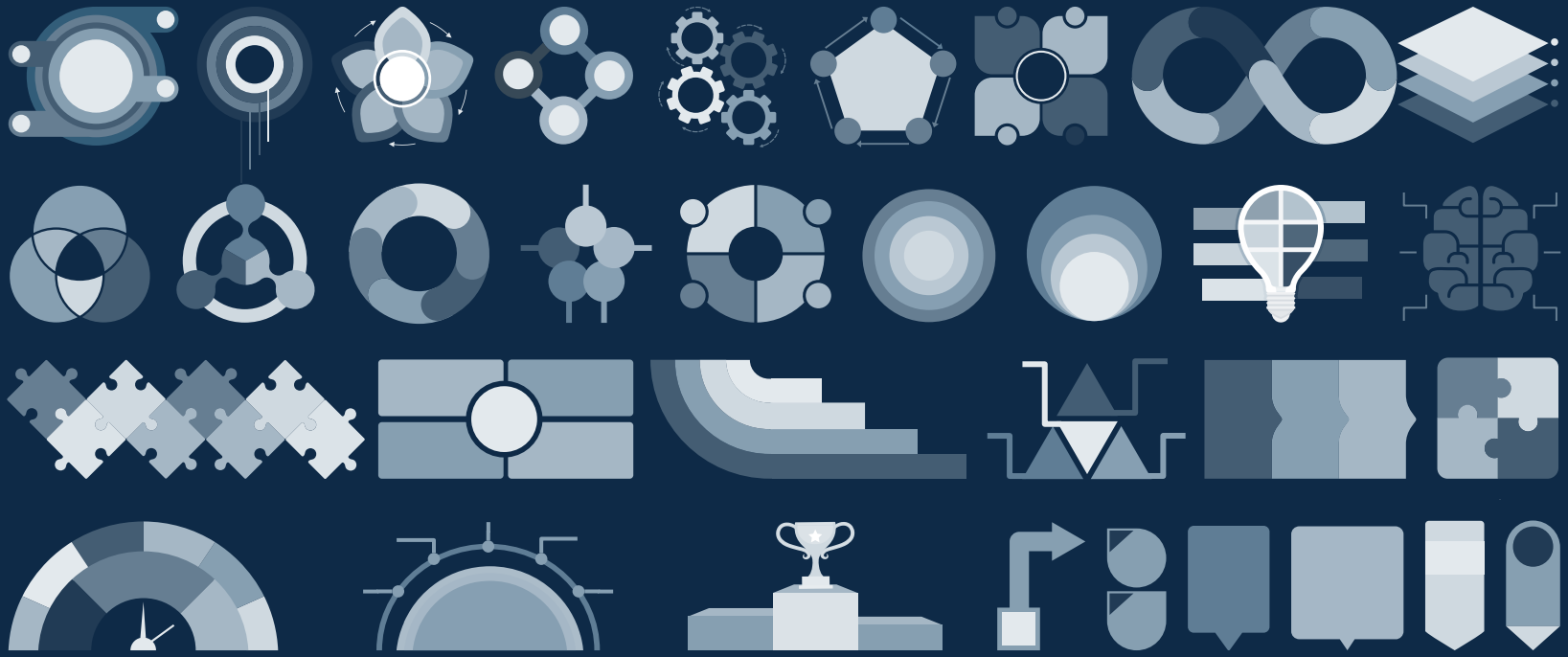


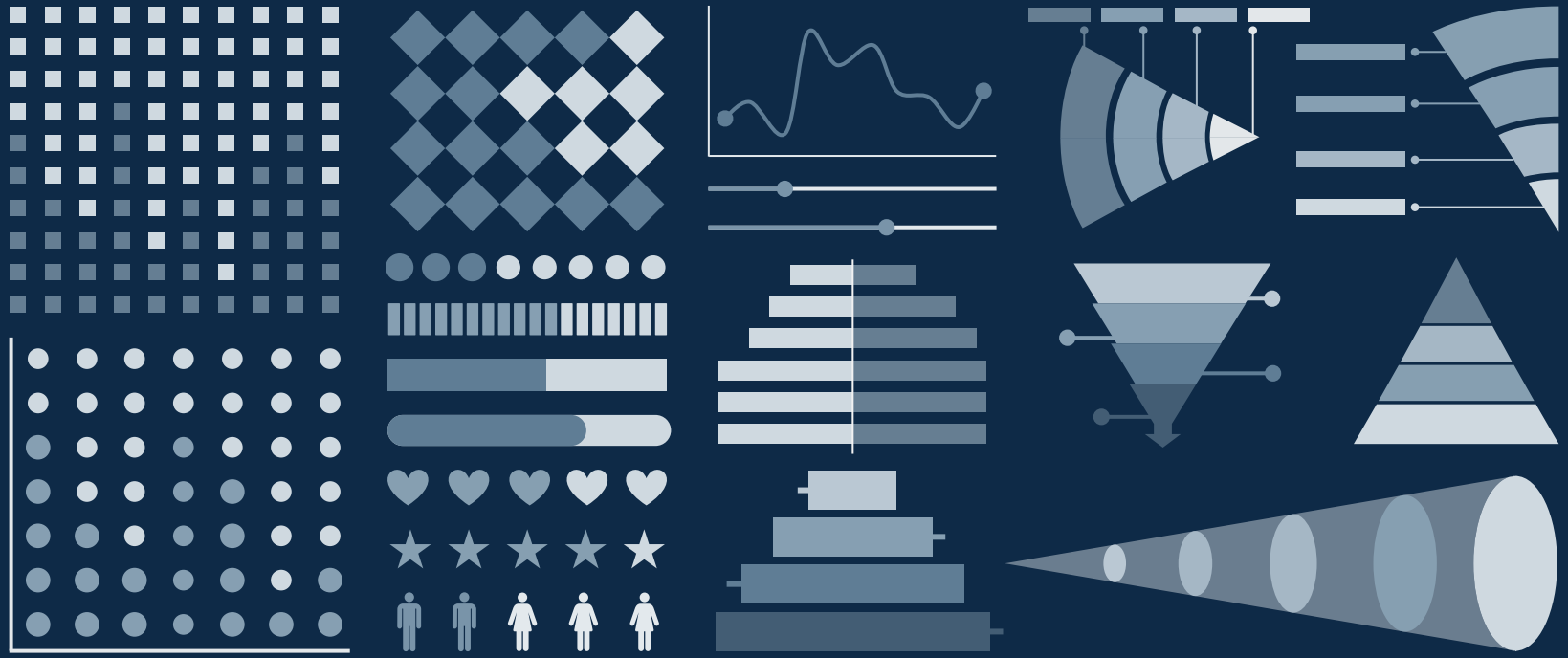







JANUARY
FEBRUARY
MARCH
APRIL
PHASE 1
Task 1
Task 2





...and our sets of editable icons

You can resize these icons without losing quality.
You can change the stroke and fill color; just select the icon and click on the paint bucket/pen.
In Google Slides, you can also use Flaticon's extension, allowing you to customize and add even more icons.

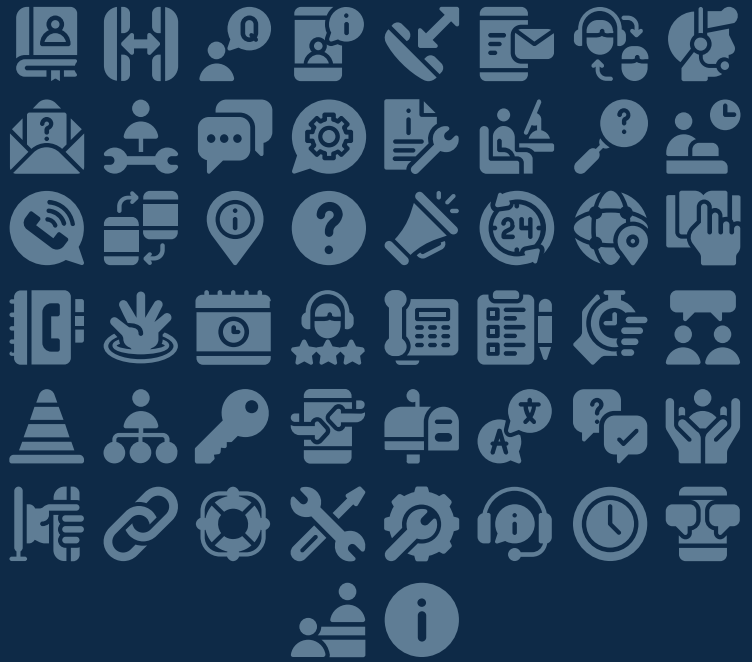
Educational Icons

Medical Icons

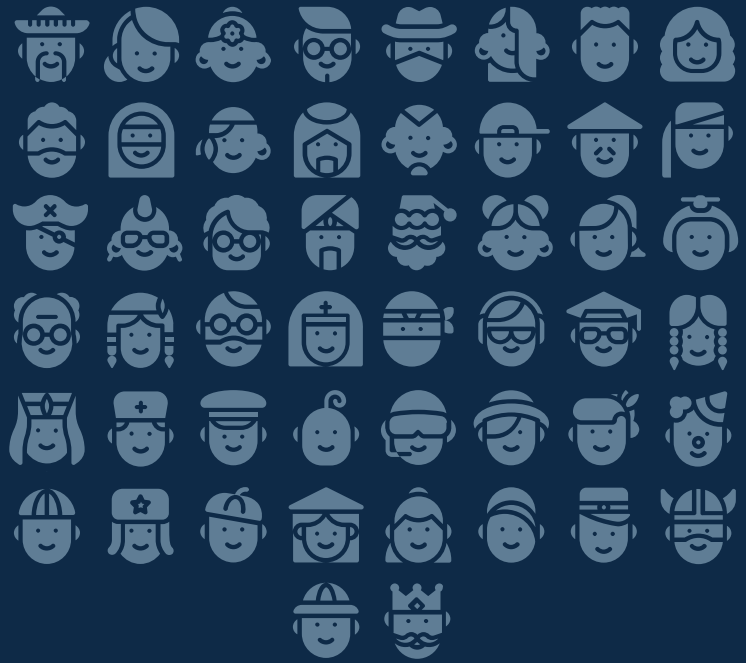
Business Icons

Teamwork Icons

Help & Support Icons



Avatar Icons



Creative Process Icons

Performing Arts Icons

Nature Icons

SEO & Marketing Icons


slidesgo