UAV Workshop

Introduction to Python Programming

Prof. Venki Muthukumar, Ph.D.

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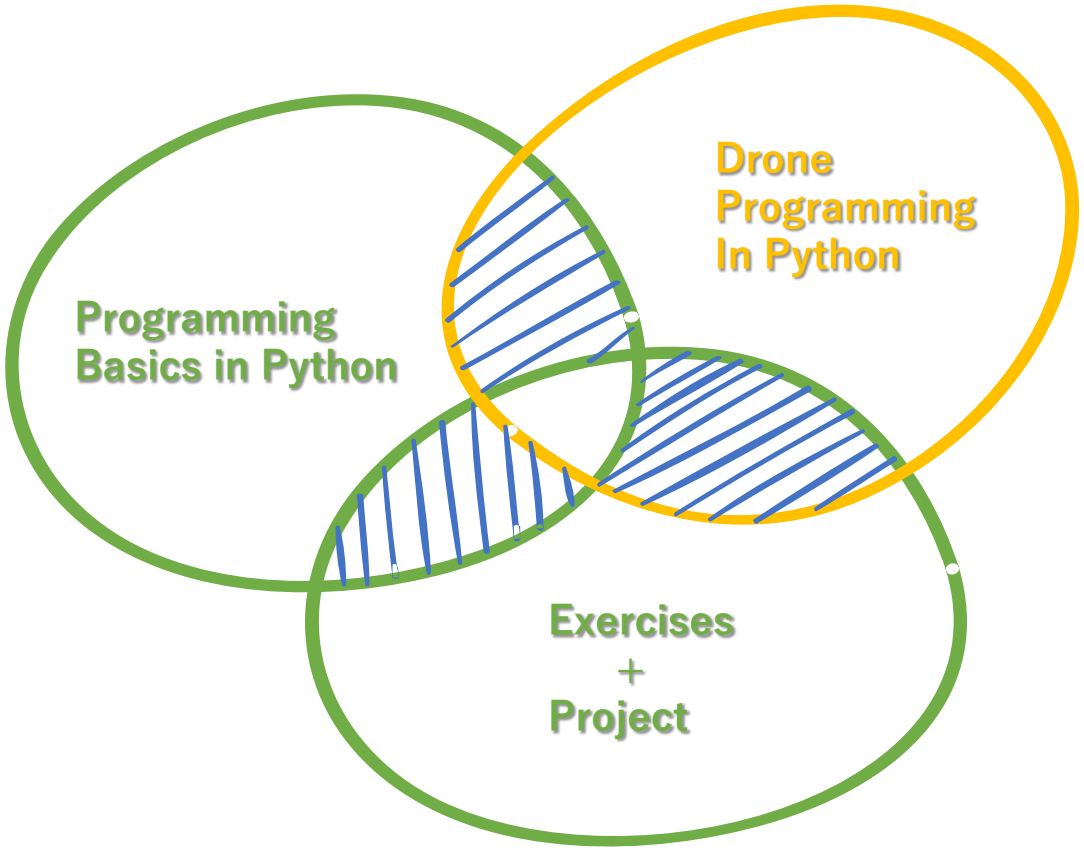
Python Overview

Python Basics JupyterNotebook Programming Syntax

Visualization Pandas DJI-SDK

Matplotlib OpenCV

Course Overview



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Python Introduction

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PYTHON

let me talk a story!

why we choose python?

* python is maintainable
* python is flexible
* python is easy and learn and use

python™

Working Environment Setup

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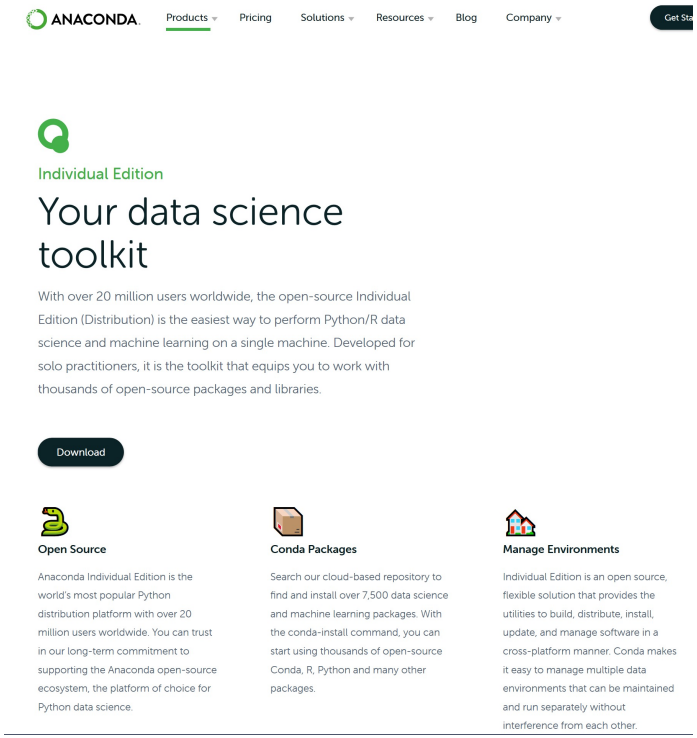
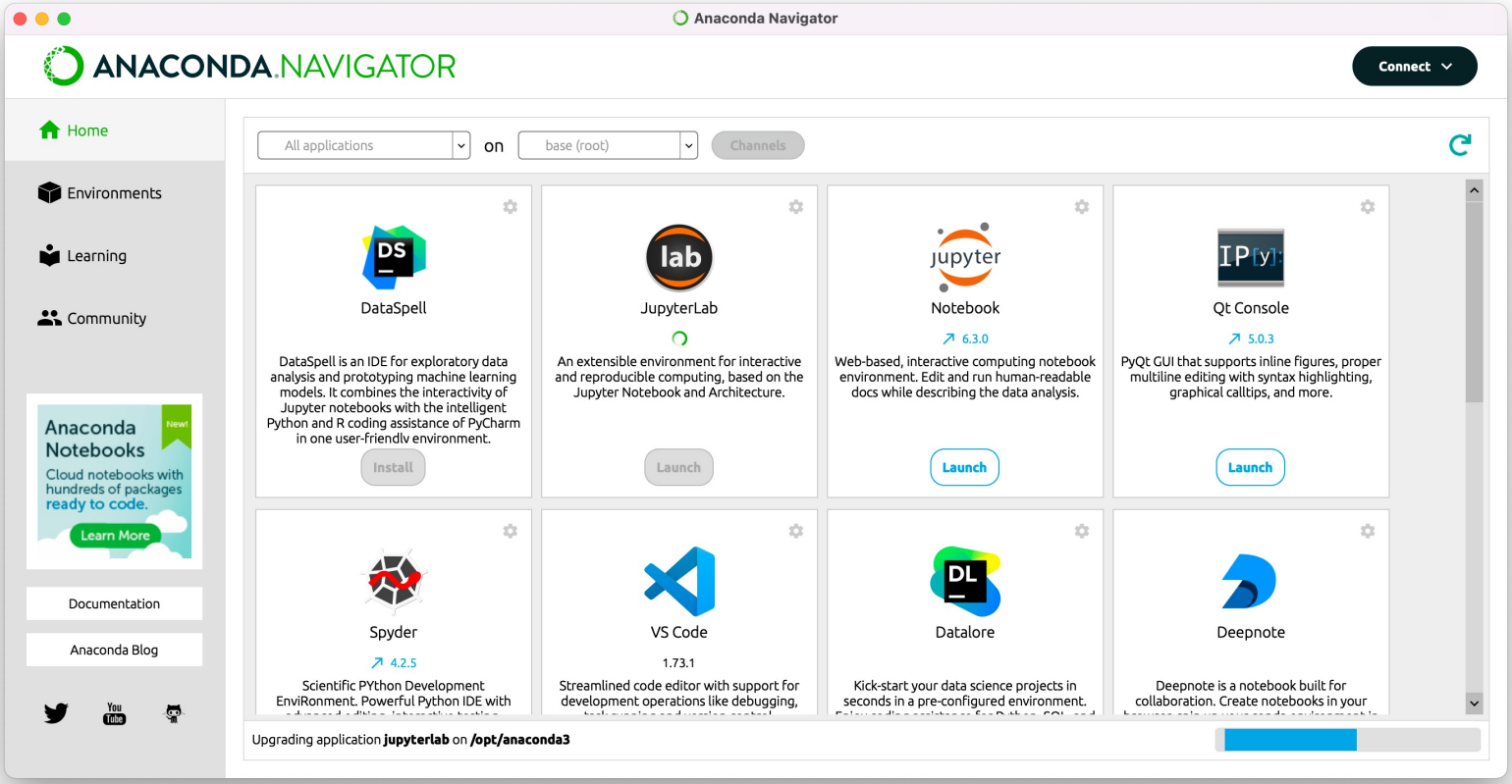
https://www.anaconda.com/products/individual#Links

All Magic
Starts here



Anaconda.Navigator



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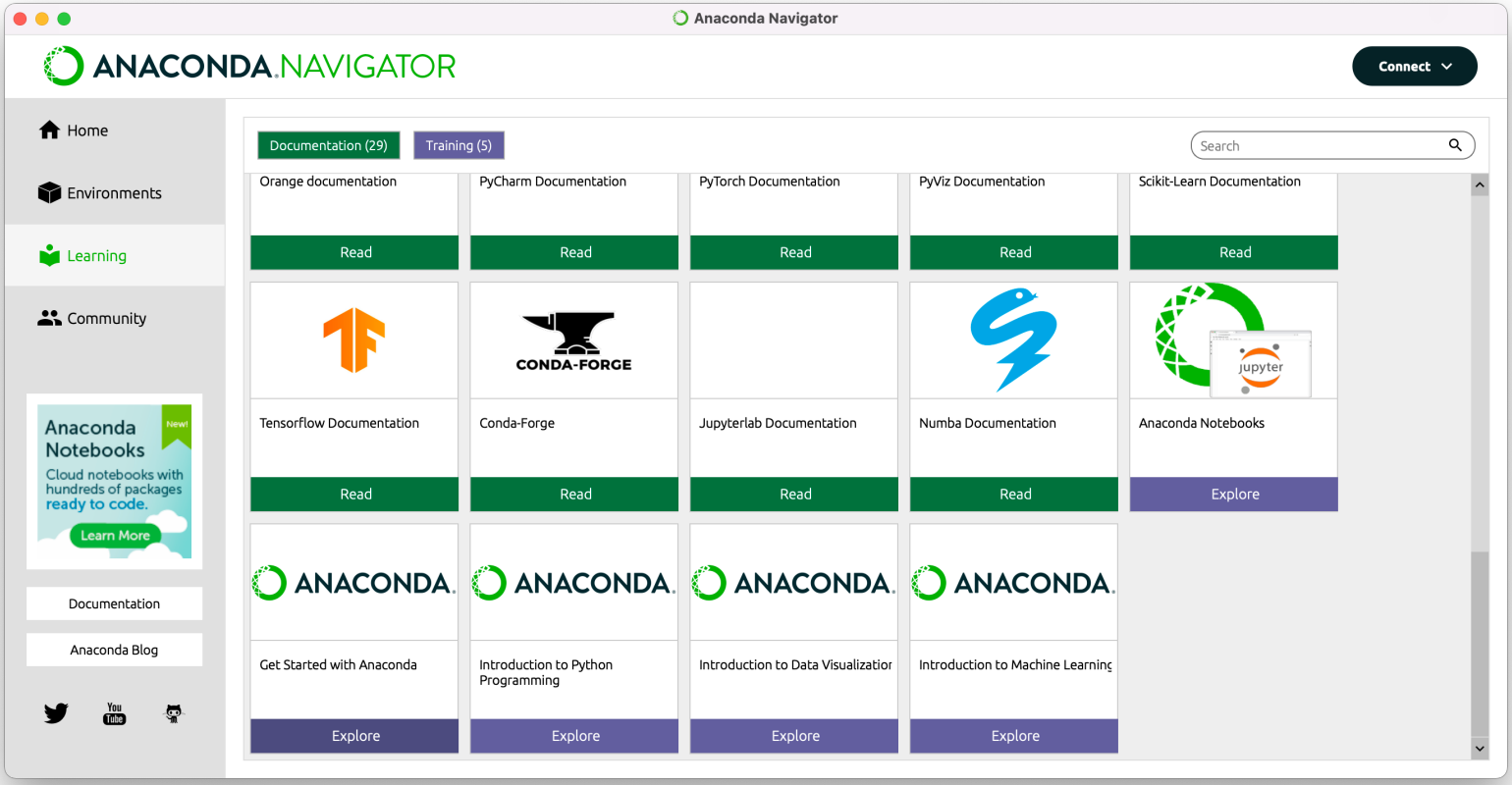
freelearning.anaconda.cloud



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Review - Get Started with Anaconda

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- Anaconda Distribution versus Miniconda (00:01:47)
- Installing Anaconda (Windows) (00:02:37) *optional*
- Installing Anaconda (Mac) (00:03:01) *optional*
- What is Python? (00:02:13)
- What are Modules, Packages, and Libraries? (00:02:01)
- Understanding Conda (00:02:24)
- Conda Workflow: Creating Environments, Installing Packages, and Launching an IDE (00:04:17)
- What is an IDE? (00:02:04)
- What is Jupyter Notebook and JupyterLab? (00:06:16)
- Getting Started with a Jupyter Notebook and JupyterLab (00:07:04)
- Create a simple Python program in Jupyter (00:02:25) *optional*
- Create a simple Python program in Spyder (00:02:15) *optional*
- Create a simple Python program in PyCharm (00:02:57) *optional*
- Create a simple Python program in VS Code (00:01:43) *optional*
- Create a simple Python program in a text editor (00:02:02) *optional*
- Conda cheat sheet
- End of Course Survey

Demo

```
# import the two modules needed
import pandas as pd
import plotly.express as px
# read the .csv file
df = pd.read_csv('owid-covid-data.csv')
# generate graph for us
fig = px.choropleth(df, locations="iso_code",
                    color="new_cases",
                    hover_name="location",
                    animation_frame="date",
                    title = "Daily new COVID cases",
                    color_continuous_scale=px.colors.sequential.PuRd)

#adjust the graph and text layout
fig["layout"].pop("updatemenus")

# show the graph
fig.show()
```

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Data Visualization Using Matplotlib

Example

	EMPID	Gender	Age	Sales	BMI	Income
0	E001	M	34	123	Normal	350
1	E002	F	40	114	Overweight	450
2	E003	F	37	135	Obesity	169
3	E004	M	30	139	Underweight	189
4	E005	F	44	117	Underweight	183
5	E006	M	36	121	Normal	80
6	E007	M	32	133	Obesity	166
7	E008	F	26	140	Normal	120
8	E009	M	32	133	Normal	75
9	E010	M	36	133	Underweight	40

3 Numeric Data

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Histogram

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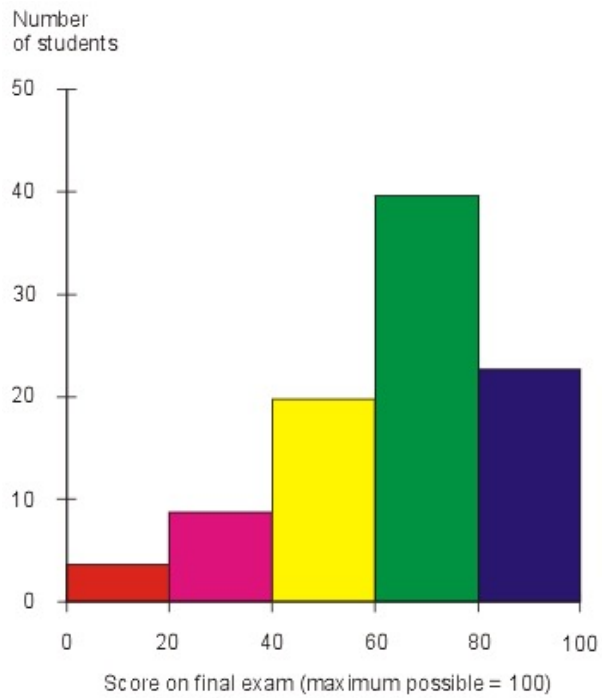
A histogram is a display of statistical information that uses rectangles to show ***the frequency of data items*** in ***successive numerical intervals of equal size***.



Bar Plot

A barplot shows the relationship between ***a numeric*** and ***a categoric variable***. A barplot can also display values for several levels of grouping. With this kind of information it is possible to build a <u>grouped barplot.</u>

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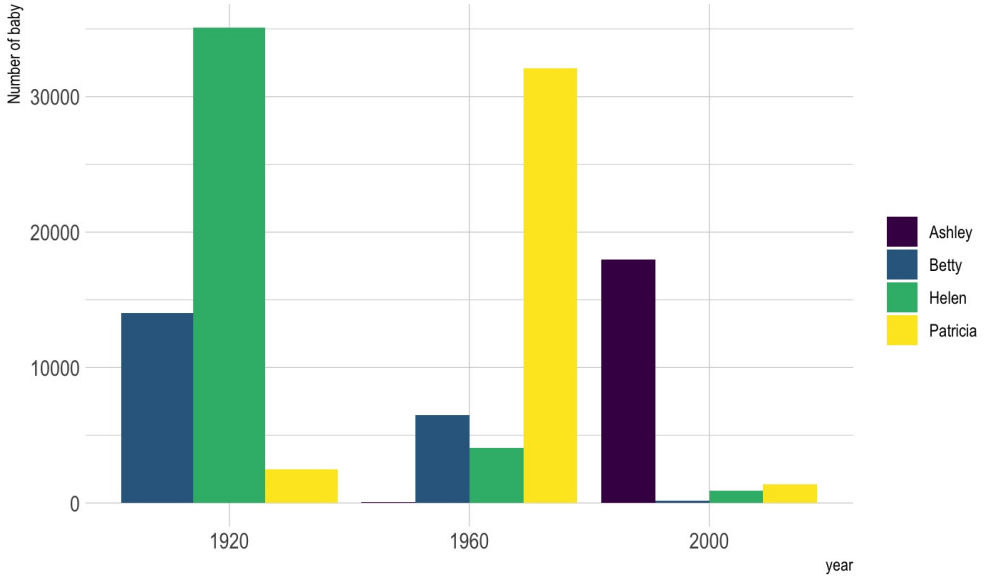

Box-plot Chart

A box-plot chart gives a nice summary of one or several numeric variables. The line that divides the box into 2 parts represents the ***median*** of the data. The end of the box shows the ***upper*** and ***lower quartiles***. The extreme lines show the ***highest*** and ***lowest value*** excluding outliers.

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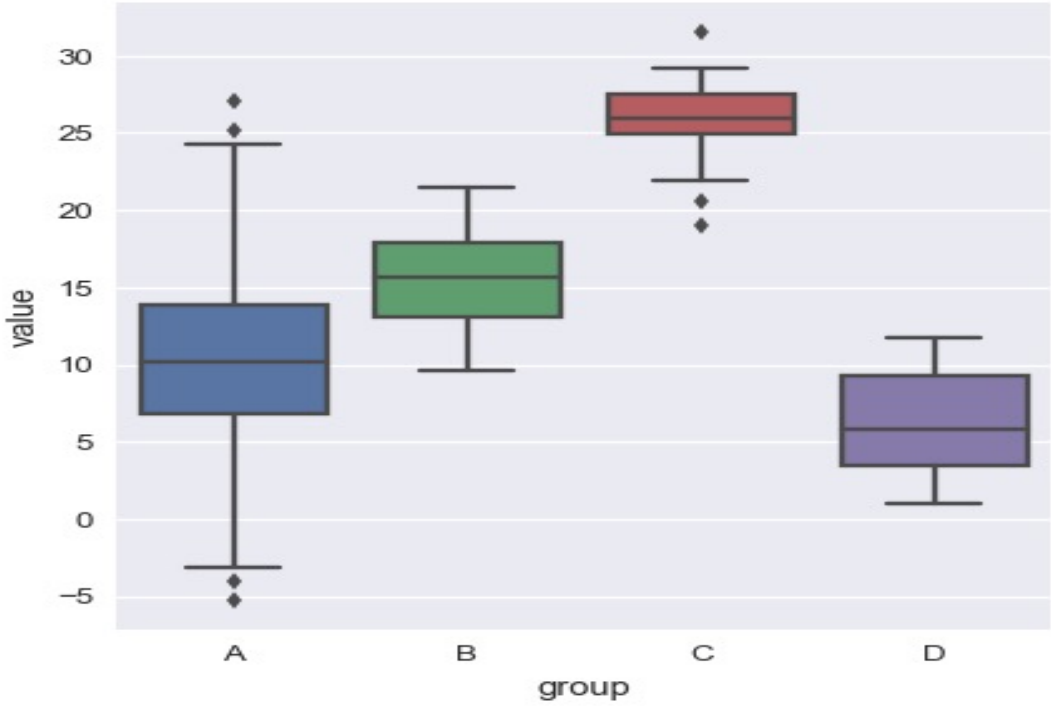

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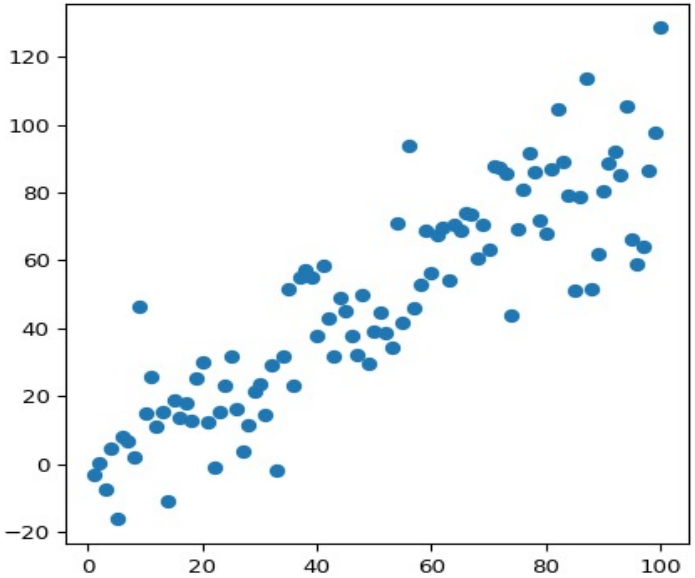
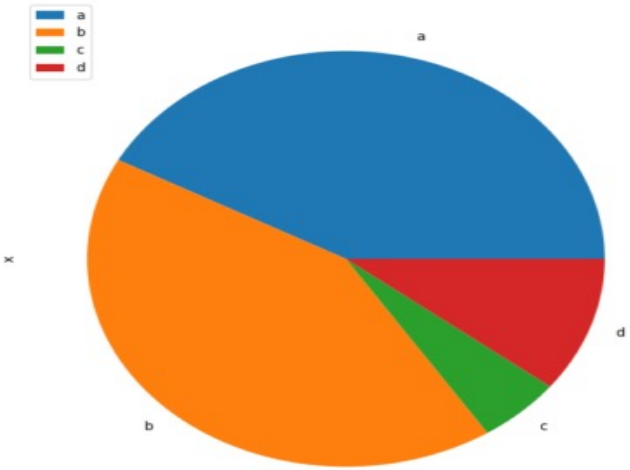
Scatter **P**lot

A scatter plot displays the relationship between two numeric variables and it can reveal the distribution trends. It should be used when there are many different data points, and you want to highlight similarities in the data set. This is useful when looking for outliers and for understanding the distribution of your data.



Pie Chart

A pie chart is a circular graphic which is divided into **slices to illustrate numerical proportion**. The point of a pie chart is to show the **relationship of parts out of a whole**.

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