

# Pandas

Columns

rows

problem  
with numpy  
2-D array

OK  
↓

age			
34	<u>5 tons</u>		
<u>324</u>			

homogeneity  
Column name

list  
tuple  
dictionary

dictionary {  ,  ,  }

{ name: ' / ' }

· - ·

· } ·

CSV

Comma separated  
value

mayank	python	Sunny

delimiters

, \t, ~

mayank, python, sunny

## Pandas

- ⇒ open source library
- ⇒ easy to use for data structures and data analysis
- ⇒ high performance

## Application

- ⇒ Modelling
- ⇒ Visualization
- ⇒ Big data
- ⇒ Text processing
- ⇒ Data mining
- ⇒ Statistical computing
- ⇒ Numerical Computing

## Types of Data Structures in Pandas

Data Structure	Dim <sup>n</sup>	Description
Series	1	1-D labeled homogenous size immutable
Dataframe	2	General 2-D labeled heterogenous size mutable
Panel	3	3-D labeled size mutable

## Pandas Dataframe

A dataframe is a 2-D data structure  
i.e. data is aligned in  
rows & columns

### ⇒ Features

- ⇒ Can perform arithmetic calculation
- ⇒ Analogous to excel data
- ⇒ Size mutable
- ⇒ Labeled axis (

Column Index / Headers

0 1 2 3 4 5 6 7 8 9 10 11 12 13

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked	pID
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S	3
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...)	female	38.0	1	0	PC 17599	71.2833	C85	C	1
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S	3
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S	1
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S	3

row index

column

element / value / entry

row

Dataframe

pd. Data Frame

↓  
 can convert any given  
 data (provided in right format)  
 into a df.

## Import data using Pandas

pd.read\_csv

pd.read\_table

pd.read\_json

pd.read\_sql

pd.read\_clipboard

# Operations on Data Frame

Column

Add / Delete /  
Select /  
change name

Rows

Addition  
& deletion

	0	1	2	3	4	5	6	7	8	9
	PassengerId	Survived	Pclass	NameOfPassenger	Sex	SibSp	Parch	Ticket	Fare	Cabin
0	1	0	3	Braund, Mr. Owen Harris	male	1	0	A/5 21171	7.2500	None
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	1	0	PC 17599	71.2833	C85
2	3	1	3	Heikkinen, Miss. Laina	female	0	0	STON/O2. 3101282	7.9250	None
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	1	0	113803	53.1000	C123
4	5	0	3	Allen, Mr. William Henry	male	0	0	373450	8.0500	None

Index  
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`titanic[0:3]`

`titanic[0:3, 0:3]`

`titanic.iloc [row, col]`