

# Car\_price

December 7, 2025

```
[1]: import numpy as n
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
[2]: Df=pd.read_csv('/content/drive/MyDrive/Netflix/daTA.csv')
```

```
[3]: Df
```

```
[3]:
```

	Car_Name	Year	Selling_Price	Present_Price	Kms_Driven	Fuel_Type	\
0	ritz	2014	3.35	5.59	27000	Petrol	
1	sx4	2013	4.75	9.54	43000	Diesel	
2	ciaz	2017	7.25	9.85	6900	Petrol	
3	wagon r	2011	2.85	4.15	5200	Petrol	
4	swift	2014	4.60	6.87	42450	Diesel	
..	...	...	...	...	...	...	
296	city	2016	9.50	11.60	33988	Diesel	
297	brio	2015	4.00	5.90	60000	Petrol	
298	city	2009	3.35	11.00	87934	Petrol	
299	city	2017	11.50	12.50	9000	Diesel	
300	brio	2016	5.30	5.90	5464	Petrol	

	Seller_Type	Transmission	Owner
0	Dealer	Manual	0
1	Dealer	Manual	0
2	Dealer	Manual	0
3	Dealer	Manual	0
4	Dealer	Manual	0
..	...	...	...
296	Dealer	Manual	0
297	Dealer	Manual	0
298	Dealer	Manual	0
299	Dealer	Manual	0
300	Dealer	Manual	0

[301 rows x 9 columns]

```
[4]: Df.shape
```

```
[4]: (301, 9)
```

```
[5]: Df.isnull().sum()
```

```
[5]: Car_Name      0
     Year          0
     Selling_Price 0
     Present_Price 0
     Kms_Driven     0
     Fuel_Type      0
     Seller_Type    0
     Transmission   0
     Owner          0
     dtype: int64
```

```
[6]: Df.duplicated().sum()
```

```
[6]: np.int64(2)
```

```
[7]: Df.drop_duplicates(inplace=True)
```

```
[8]: Df
```

```
[8]:   Car_Name  Year  Selling_Price  Present_Price  Kms_Driven  Fuel_Type  \
0      ritz  2014           3.35           5.59       27000    Petrol
1       sx4  2013           4.75           9.54       43000    Diesel
2      ciaz  2017           7.25           9.85        6900    Petrol
3  wagon r  2011           2.85           4.15        5200    Petrol
4     swift  2014           4.60           6.87       42450    Diesel
..      ...   ...
296   city  2016           9.50          11.60       33988    Diesel
297   brio  2015           4.00           5.90       60000    Petrol
298   city  2009           3.35          11.00       87934    Petrol
299   city  2017          11.50          12.50        9000    Diesel
300   brio  2016           5.30           5.90        5464    Petrol
```

```
   Seller_Type  Transmission  Owner
0      Dealer      Manual      0
1      Dealer      Manual      0
2      Dealer      Manual      0
3      Dealer      Manual      0
4      Dealer      Manual      0
..      ...      ...      ...
296   Dealer      Manual      0
297   Dealer      Manual      0
```

```

298      Dealer      Manual      0
299      Dealer      Manual      0
300      Dealer      Manual      0

```

[299 rows x 9 columns]

[9]: `Df.info()`

```

<class 'pandas.core.frame.DataFrame'>
Index: 299 entries, 0 to 300
Data columns (total 9 columns):
 #   Column          Non-Null Count  Dtype
---  -
 0   Car_Name        299 non-null    object
 1   Year            299 non-null    int64
 2   Selling_Price    299 non-null    float64
 3   Present_Price    299 non-null    float64
 4   Kms_Driven       299 non-null    int64
 5   Fuel_Type        299 non-null    object
 6   Seller_Type      299 non-null    object
 7   Transmission     299 non-null    object
 8   Owner            299 non-null    int64
dtypes: float64(2), int64(3), object(4)
memory usage: 23.4+ KB

```

[10]: `Df.describe()`

```

[10]:
count      299.000000      299.000000      299.000000      299.000000      299.000000
mean      2013.615385         4.589632         7.541037      36916.752508         0.043478
std         2.896868         4.984240         8.567887      39015.170352         0.248720
min       2003.000000         0.100000         0.320000         500.000000         0.000000
25%       2012.000000         0.850000         1.200000      15000.000000         0.000000
50%       2014.000000         3.510000         6.100000      32000.000000         0.000000
75%       2016.000000         6.000000         9.840000      48883.500000         0.000000
max       2018.000000        35.000000        92.600000     500000.000000         3.000000

```

```

[11]: # average selling price of car is 4.589632
      # minimum selling price of car is 0.1
      # maximum selling price of car is 35

```

[12]: `print(Df['Fuel_Type'].value_counts())`

```

Fuel_Type
Petrol      239
Diesel       58
CNG          2
Name: count, dtype: int64

```

```
[13]: #There are 3 types of fuel petrol,Dieseland CNG.
```

### 0.0.1 Implementing a Car Class for the Dataset

I will now define a Car class that encapsulates the properties of each car from your dataset. Each instance of this Car class will represent a single car, making it easier to work with individual car data in an object-oriented way.

```
[14]: class Car:
    def __init__(self, car_name, year, selling_price, present_price,
    kms_driven, fuel_type, seller_type, transmission, owner):
        self.car_name = car_name
        self.year = year
        self.selling_price = selling_price
        self.present_price = present_price
        self.kms_driven = kms_driven
        self.fuel_type = fuel_type
        self.seller_type = seller_type
        self.transmission = transmission
        self.owner = owner
        self.car_age = 2024 - year # Calculate car age based on current year
    (assuming 2024)

    def get_price_difference(self):
        return self.present_price - self.selling_price

    def display_car_info(self):
        print(f"Car Name: {self.car_name}")
        print(f"  Year: {self.year} (Age: {self.car_age} years)")
        print(f"  Selling Price: {self.selling_price} Lacs")
        print(f"  Present Price: {self.present_price} Lacs")
        print(f"  Kms Driven: {self.kms_driven} km")
        print(f"  Fuel Type: {self.fuel_type}")
        print(f"  Transmission: {self.transmission}")
        print(f"  Price Difference (Present - Selling): {self.
    get_price_difference():.2f} Lacs\n")

# Now, let's create a list of Car objects from the DataFrame
car_objects = []
for index, row in Df.iterrows():
    car_objects.append(Car(
        row['Car_Name'],
        row['Year'],
        row['Selling_Price'],
        row['Present_Price'],
        row['Kms_Driven'],
        row['Fuel_Type'],
```

```

        row['Seller_Type'],
        row['Transmission'],
        row['Owner']
    ))

# Display information for the first few car objects
print("Information for the first 3 car objects:")
for i in range(3):
    if i < len(car_objects):
        car_objects[i].display_car_info()

```

Information for the first 3 car objects:

Car Name: ritz

Year: 2014 (Age: 10 years)

Selling Price: 3.35 Lacs

Present Price: 5.59 Lacs

Kms Driven: 27000 km

Fuel Type: Petrol

Transmission: Manual

Price Difference (Present - Selling): 2.24 Lacs

Car Name: sx4

Year: 2013 (Age: 11 years)

Selling Price: 4.75 Lacs

Present Price: 9.54 Lacs

Kms Driven: 43000 km

Fuel Type: Diesel

Transmission: Manual

Price Difference (Present - Selling): 4.79 Lacs

Car Name: ciaz

Year: 2017 (Age: 7 years)

Selling Price: 7.25 Lacs

Present Price: 9.85 Lacs

Kms Driven: 6900 km

Fuel Type: Petrol

Transmission: Manual

Price Difference (Present - Selling): 2.60 Lacs

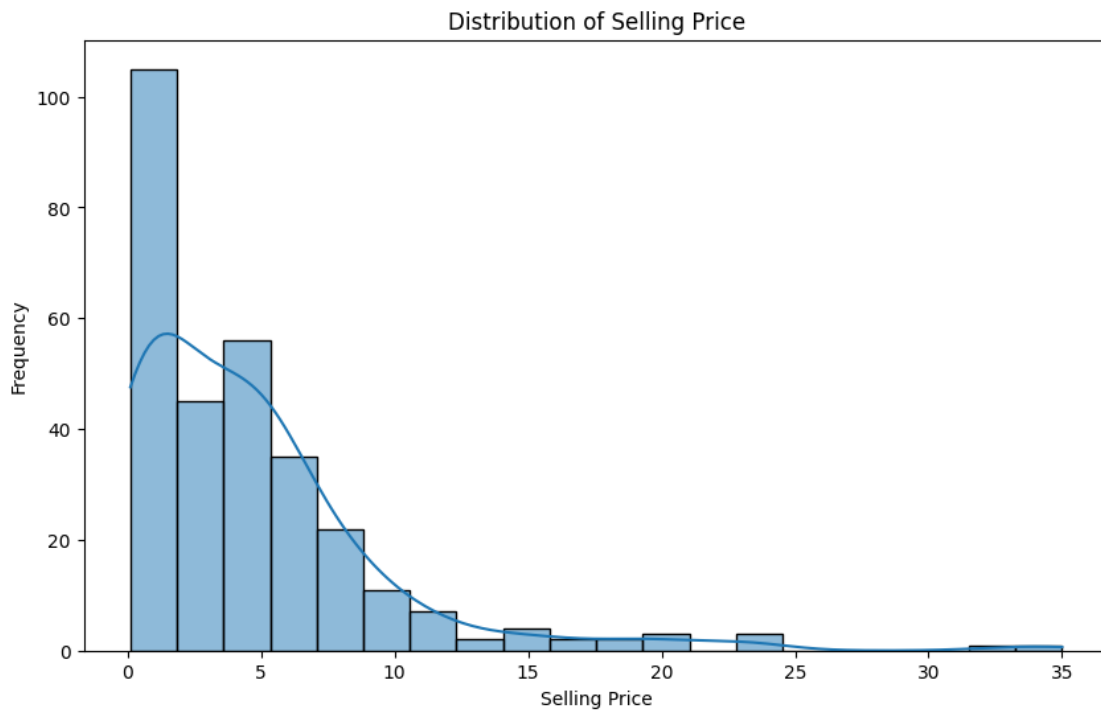
## 0.1 Visualize Selling Price Distribution

```

[15]: plt.figure(figsize=(10, 6))
      sns.histplot(Df['Selling_Price'], kde=True, bins=20)
      plt.title('Distribution of Selling Price')
      plt.xlabel('Selling Price')
      plt.ylabel('Frequency')

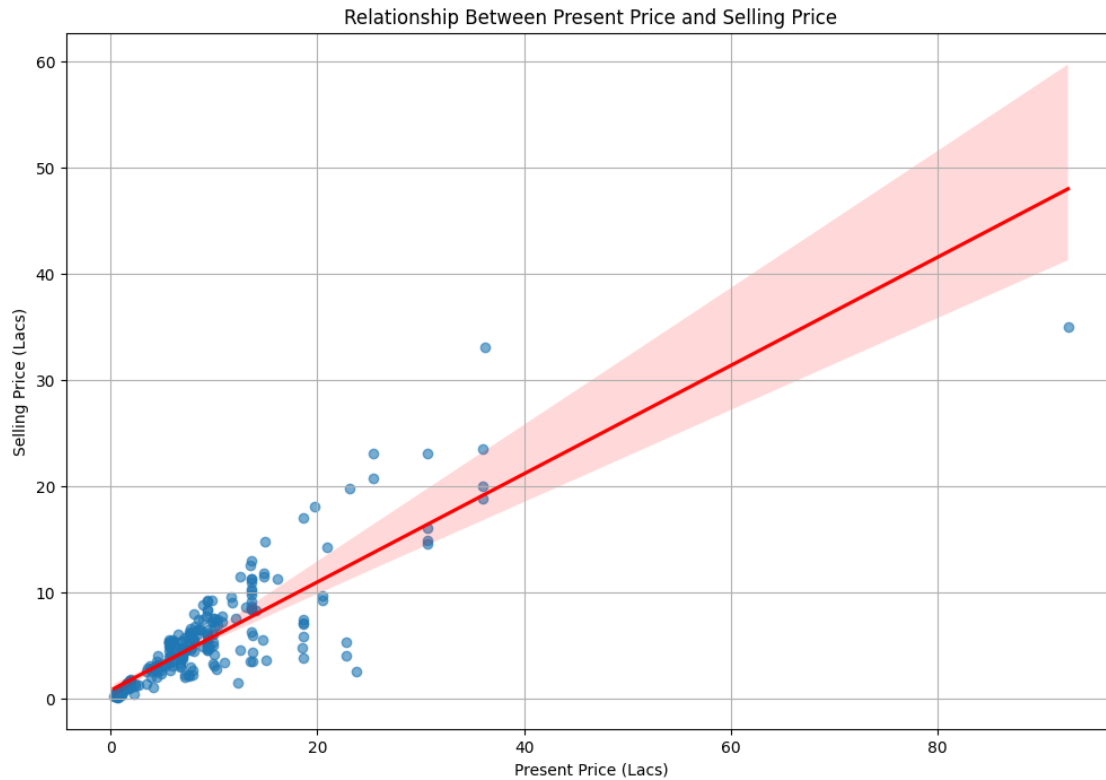
```

```
plt.show()
```



##The plot showing the relationship between 'Present Price' and 'Selling Price' has already been generated.

```
[18]: plt.figure(figsize=(12, 8))
sns.regplot(x='Present_Price', y='Selling_Price', data=Df, scatter_kws={'alpha':
↪0.6}, line_kws={'color':'red'})
plt.title('Relationship Between Present Price and Selling Price')
plt.xlabel('Present Price (Lacs)')
plt.ylabel('Selling Price (Lacs)')
plt.grid(True)
plt.show()
```



```
[19]: !apt-get install texlive-xetex texlive-fonts-recommended texlive-plain-generic
```

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

The following additional packages will be installed:

```
dvisvgm fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono
fonts-texgyre fonts-urw-base35 libapache-pom-java libcommons-logging-java
libcommons-parent-java libfontbox-java libgs9 libgs9-common libidn12
libijs-0.35 libjbig2dec0 libkpathsea6 libpdfbox-java libptexenc1 libruby3.0
libsyntax2 libteckit0 libtexlua53 libtexluajit2 libwoff1 libzip-0-13
lmodern poppler-data preview-latex-style rake ruby ruby-net-telnet
ruby-rubygems ruby-webrick ruby-xmlrpc ruby3.0 rubygems-integration t1utils
teckit tex-common tex-gyre texlive-base texlive-binaries texlive-latex-base
texlive-latex-extra texlive-latex-recommended texlive-pictures tipa
xfonts-encodings xfonts-utils
```

Suggested packages:

```
fonts-noto fonts-freefont-otf | fonts-freefont-ttf libavalon-framework-java
libcommons-logging-java-doc libexcalibur-logkit-java liblog4j1.2-java
poppler-utils ghostscript fonts-japanese-mincho | fonts-ipafont-mincho
fonts-japanese-gothic | fonts-ipafont-gothic fonts-arphic-ukai
fonts-arphic-uming fonts-nanum ri ruby-dev bundler debhelper gv
```

```
| postscript-viewer perl-tk xpdf | pdf-viewer xzdec
texlive-fonts-recommended-doc texlive-latex-base-doc python3-pygments
icc-profiles libfile-which-perl libspreadsheet-parseexcel-perl
texlive-latex-extra-doc texlive-latex-recommended-doc texlive-luatex
texlive-pstricks dot2tex prerex texlive-pictures-doc vprerex
default-jre-headless tipa-doc
```

The following NEW packages will be installed:

```
dvisvgm fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono
fonts-texgyre fonts-urw-base35 libapache-pom-java libcommons-logging-java
libcommons-parent-java libfontbox-java libgs9 libgs9-common libidn12
libijs-0.35 libjbig2dec0 libkpathsea6 libpdfbox-java libptexenc1 libruby3.0
libsynctex2 libteckit0 libtexlua53 libtexluajit2 libwoff1 libzip-0-13
lmodern poppler-data preview-latex-style rake ruby ruby-net-telnet
ruby-rubygems ruby-webrick ruby-xmlrpc ruby3.0 rubygems-integration t1utils
teckit tex-common tex-gyre texlive-base texlive-binaries
texlive-fonts-recommended texlive-latex-base texlive-latex-extra
texlive-latex-recommended texlive-pictures texlive-plain-generic
texlive-xetex tipa xfonts-encodings xfonts-utils
```

0 upgraded, 53 newly installed, 0 to remove and 41 not upgraded.

Need to get 182 MB of archives.

After this operation, 571 MB of additional disk space will be used.

Get:1 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 fonts-droid-fallback all 1:6.0.1r16-1.1build1> [1,805 kB]

Get:2 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 fonts-lato all 2.0-2.1> [2,696 kB]

Get:3 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 poppler-data all 0.4.11-1> [2,171 kB]

Get:4 <http://archive.ubuntu.com/ubuntu/jammy/universe amd64 tex-common all 6.17> [33.7 kB]

Get:5 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 fonts-urw-base35 all 20200910-1> [6,367 kB]

Get:6 <http://archive.ubuntu.com/ubuntu/jammy-updates/main amd64 libgs9-common all 9.55.0~dfsg1-0ubuntu5.13> [753 kB]

Get:7 <http://archive.ubuntu.com/ubuntu/jammy-updates/main amd64 libidn12 amd64 1.38-4ubuntu1> [60.0 kB]

Get:8 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 libijs-0.35 amd64 0.35-15build2> [16.5 kB]

Get:9 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 libjbig2dec0 amd64 0.19-3build2> [64.7 kB]

Get:10 <http://archive.ubuntu.com/ubuntu/jammy-updates/main amd64 libgs9 amd64 9.55.0~dfsg1-0ubuntu5.13> [5,032 kB]

Get:11 <http://archive.ubuntu.com/ubuntu/jammy-updates/main amd64 libkpathsea6 amd64 2021.20210626.59705-1ubuntu0.2> [60.4 kB]

Get:12 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 libwoff1 amd64 1.0.2-1build4> [45.2 kB]

Get:13 <http://archive.ubuntu.com/ubuntu/jammy/universe amd64 dvisvgm amd64 2.13.1-1> [1,221 kB]

Get:14 <http://archive.ubuntu.com/ubuntu/jammy/universe amd64 fonts-lmodern all>



2.004.5-6.1 [4,532 kB]  
 Get:15 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 fonts-noto-mono all  
 20201225-1build1 [397 kB]  
 Get:16 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 fonts-texgyre all  
 20180621-3.1 [10.2 MB]  
 Get:17 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 libapache-pom-java  
 all 18-1 [4,720 B]  
 Get:18 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 libcommons-parent-  
 java all 43-1 [10.8 kB]  
 Get:19 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 libcommons-logging-  
 java all 1.2-2 [60.3 kB]  
 Get:20 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64 libptexenc1  
 amd64 2021.20210626.59705-1ubuntu0.2 [39.1 kB]  
 Get:21 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 rubygems-integration  
 all 1.18 [5,336 B]  
 Get:22 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64 ruby3.0 amd64  
 3.0.2-7ubuntu2.11 [50.1 kB]  
 Get:23 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64 ruby-rubygems  
 all 3.3.5-2ubuntu1.2 [228 kB]  
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 [5,100 B]  
 Get:25 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 rake all 13.0.6-2 [61.7  
 kB]  
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 0.1.1-2 [12.6 kB]  
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 all 1.7.0-3ubuntu0.2 [52.5 kB]  
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 0.3.2-1ubuntu0.1 [24.9 kB]  
 Get:29 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64 libruby3.0  
 amd64 3.0.2-7ubuntu2.11 [5,114 kB]  
 Get:30 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64 libsynchronex2  
 amd64 2021.20210626.59705-1ubuntu0.2 [55.6 kB]  
 Get:31 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 libteckit0 amd64  
 2.5.11+ds1-1 [421 kB]  
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 amd64 2021.20210626.59705-1ubuntu0.2 [120 kB]  
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 amd64 2021.20210626.59705-1ubuntu0.2 [267 kB]  
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 0.13.72+dfsg.1-1.1 [27.0 kB]  
 Get:35 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 xfonts-encodings all  
 1:1.0.5-0ubuntu2 [578 kB]  
 Get:36 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 xfonts-utils amd64  
 1:7.7+6build2 [94.6 kB]  
 Get:37 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 lmodern all  
 2.004.5-6.1 [9,471 kB]  
 Get:38 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 preview-latex-style

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all 12.2-1ubuntu1 [185 kB]
Get:39 http://archive.ubuntu.com/ubuntu jammy/main amd64 t1utils amd64
1.41-4build2 [61.3 kB]
Get:40 http://archive.ubuntu.com/ubuntu jammy/universe amd64 teckit amd64
2.5.11+ds1-1 [699 kB]
Get:41 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tex-gyre all
20180621-3.1 [6,209 kB]
Get:42 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 texlive-
binaries amd64 2021.20210626.59705-1ubuntu0.2 [9,860 kB]
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2021.20220204-1 [21.0 MB]
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recommended all 2021.20220204-1 [4,972 kB]
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all 2021.20220204-1 [1,128 kB]
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1:1.8.16-2 [207 kB]
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recommended all 2021.20220204-1 [14.4 MB]
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all 2021.20220204-1 [13.9 MB]
Get:51 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-plain-
generic all 2021.20220204-1 [27.5 MB]
Get:52 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tipa all 2:1.3-21
[2,967 kB]
Get:53 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-xetex all
2021.20220204-1 [12.4 MB]
Fetched 182 MB in 2s (80.1 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Selecting previously unselected package fonts-droid-fallback.
(Reading database ... 121713 files and directories currently installed.)
Preparing to unpack .../00-fonts-droid-fallback_1%3a6.0.1r16-1.1build1_all.deb
...
Unpacking fonts-droid-fallback (1:6.0.1r16-1.1build1) ...
Selecting previously unselected package fonts-lato.
Preparing to unpack .../01-fonts-lato_2.0-2.1_all.deb ...
Unpacking fonts-lato (2.0-2.1) ...
Selecting previously unselected package poppler-data.
Preparing to unpack .../02-poppler-data_0.4.11-1_all.deb ...
Unpacking poppler-data (0.4.11-1) ...
Selecting previously unselected package tex-common.
Preparing to unpack .../03-tex-common_6.17_all.deb ...
Unpacking tex-common (6.17) ...

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Selecting previously unselected package fonts-urw-base35.
Preparing to unpack .../04-fonts-urw-base35_20200910-1_all.deb ...
Unpacking fonts-urw-base35 (20200910-1) ...
Selecting previously unselected package libgs9-common.
Preparing to unpack .../05-libgs9-common_9.55.0~dfsg1-0ubuntu5.13_all.deb ...
Unpacking libgs9-common (9.55.0~dfsg1-0ubuntu5.13) ...
Selecting previously unselected package libidn12:amd64.
Preparing to unpack .../06-libidn12_1.38-4ubuntu1_amd64.deb ...
Unpacking libidn12:amd64 (1.38-4ubuntu1) ...
Selecting previously unselected package libijs-0.35:amd64.
Preparing to unpack .../07-libijs-0.35_0.35-15build2_amd64.deb ...
Unpacking libijs-0.35:amd64 (0.35-15build2) ...
Selecting previously unselected package libjbig2dec0:amd64.
Preparing to unpack .../08-libjbig2dec0_0.19-3build2_amd64.deb ...
Unpacking libjbig2dec0:amd64 (0.19-3build2) ...
Selecting previously unselected package libgs9:amd64.
Preparing to unpack .../09-libgs9_9.55.0~dfsg1-0ubuntu5.13_amd64.deb ...
Unpacking libgs9:amd64 (9.55.0~dfsg1-0ubuntu5.13) ...
Selecting previously unselected package libkpathsea6:amd64.
Preparing to unpack .../10-libkpathsea6_2021.20210626.59705-1ubuntu0.2_amd64.deb
...
Unpacking libkpathsea6:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package libwoff1:amd64.
Preparing to unpack .../11-libwoff1_1.0.2-1build4_amd64.deb ...
Unpacking libwoff1:amd64 (1.0.2-1build4) ...
Selecting previously unselected package dvisvgm.
Preparing to unpack .../12-dvisvgm_2.13.1-1_amd64.deb ...
Unpacking dvisvgm (2.13.1-1) ...
Selecting previously unselected package fonts-lmodern.
Preparing to unpack .../13-fonts-lmodern_2.004.5-6.1_all.deb ...
Unpacking fonts-lmodern (2.004.5-6.1) ...
Selecting previously unselected package fonts-noto-mono.
Preparing to unpack .../14-fonts-noto-mono_20201225-1build1_all.deb ...
Unpacking fonts-noto-mono (20201225-1build1) ...
Selecting previously unselected package fonts-texgyre.
Preparing to unpack .../15-fonts-texgyre_20180621-3.1_all.deb ...
Unpacking fonts-texgyre (20180621-3.1) ...
Selecting previously unselected package libapache-pom-java.
Preparing to unpack .../16-libapache-pom-java_18-1_all.deb ...
Unpacking libapache-pom-java (18-1) ...
Selecting previously unselected package libcommons-parent-java.
Preparing to unpack .../17-libcommons-parent-java_43-1_all.deb ...
Unpacking libcommons-parent-java (43-1) ...
Selecting previously unselected package libcommons-logging-java.
Preparing to unpack .../18-libcommons-logging-java_1.2-2_all.deb ...
Unpacking libcommons-logging-java (1.2-2) ...
Selecting previously unselected package libptexenc1:amd64.
Preparing to unpack .../19-libptexenc1_2021.20210626.59705-1ubuntu0.2_amd64.deb

```

```

...
Unpacking libptexenc1:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package rubygems-integration.
Preparing to unpack .../20-rubygems-integration_1.18_all.deb ...
Unpacking rubygems-integration (1.18) ...
Selecting previously unselected package ruby3.0.
Preparing to unpack .../21-ruby3.0_3.0.2-7ubuntu2.11_amd64.deb ...
Unpacking ruby3.0 (3.0.2-7ubuntu2.11) ...
Selecting previously unselected package ruby-rubygems.
Preparing to unpack .../22-ruby-rubygems_3.3.5-2ubuntu1.2_all.deb ...
Unpacking ruby-rubygems (3.3.5-2ubuntu1.2) ...
Selecting previously unselected package ruby.
Preparing to unpack .../23-ruby_1%3a3.0~exp1_amd64.deb ...
Unpacking ruby (1:3.0~exp1) ...
Selecting previously unselected package rake.
Preparing to unpack .../24-rake_13.0.6-2_all.deb ...
Unpacking rake (13.0.6-2) ...
Selecting previously unselected package ruby-net-telnet.
Preparing to unpack .../25-ruby-net-telnet_0.1.1-2_all.deb ...
Unpacking ruby-net-telnet (0.1.1-2) ...
Selecting previously unselected package ruby-webrick.
Preparing to unpack .../26-ruby-webrick_1.7.0-3ubuntu0.2_all.deb ...
Unpacking ruby-webrick (1.7.0-3ubuntu0.2) ...
Selecting previously unselected package ruby-xmlrpc.
Preparing to unpack .../27-ruby-xmlrpc_0.3.2-1ubuntu0.1_all.deb ...
Unpacking ruby-xmlrpc (0.3.2-1ubuntu0.1) ...
Selecting previously unselected package libruby3.0:amd64.
Preparing to unpack .../28-libruby3.0_3.0.2-7ubuntu2.11_amd64.deb ...
Unpacking libruby3.0:amd64 (3.0.2-7ubuntu2.11) ...
Selecting previously unselected package libsyntax2:amd64.
Preparing to unpack .../29-libsyntax2_2021.20210626.59705-1ubuntu0.2_amd64.deb
...
Unpacking libsyntax2:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package libteckit0:amd64.
Preparing to unpack .../30-libteckit0_2.5.11+ds1-1_amd64.deb ...
Unpacking libteckit0:amd64 (2.5.11+ds1-1) ...
Selecting previously unselected package libtexlua53:amd64.
Preparing to unpack .../31-libtexlua53_2021.20210626.59705-1ubuntu0.2_amd64.deb
...
Unpacking libtexlua53:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package libtexluajit2:amd64.
Preparing to unpack
.../32-libtexluajit2_2021.20210626.59705-1ubuntu0.2_amd64.deb ...
Unpacking libtexluajit2:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package libzip-0-13:amd64.
Preparing to unpack .../33-libzip-0-13_0.13.72+dfsg.1-1.1_amd64.deb ...
Unpacking libzip-0-13:amd64 (0.13.72+dfsg.1-1.1) ...
Selecting previously unselected package xfonts-encodings.

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Preparing to unpack .../34-xfonts-encodings_1%3a1.0.5-0ubuntu2_all.deb ...
Unpacking xfonts-encodings (1:1.0.5-0ubuntu2) ...
Selecting previously unselected package xfonts-utils.
Preparing to unpack .../35-xfonts-utils_1%3a7.7+6build2_amd64.deb ...
Unpacking xfonts-utils (1:7.7+6build2) ...
Selecting previously unselected package lmodern.
Preparing to unpack .../36-lmodern_2.004.5-6.1_all.deb ...
Unpacking lmodern (2.004.5-6.1) ...
Selecting previously unselected package preview-latex-style.
Preparing to unpack .../37-preview-latex-style_12.2-1ubuntu1_all.deb ...
Unpacking preview-latex-style (12.2-1ubuntu1) ...
Selecting previously unselected package t1utils.
Preparing to unpack .../38-t1utils_1.41-4build2_amd64.deb ...
Unpacking t1utils (1.41-4build2) ...
Selecting previously unselected package teckit.
Preparing to unpack .../39-teckit_2.5.11+ds1-1_amd64.deb ...
Unpacking teckit (2.5.11+ds1-1) ...
Selecting previously unselected package tex-gyre.
Preparing to unpack .../40-tex-gyre_20180621-3.1_all.deb ...
Unpacking tex-gyre (20180621-3.1) ...
Selecting previously unselected package texlive-binaries.
Preparing to unpack .../41-texlive-
binaries_2021.20210626.59705-1ubuntu0.2_amd64.deb ...
Unpacking texlive-binaries (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package texlive-base.
Preparing to unpack .../42-texlive-base_2021.20220204-1_all.deb ...
Unpacking texlive-base (2021.20220204-1) ...
Selecting previously unselected package texlive-fonts-recommended.
Preparing to unpack .../43-texlive-fonts-recommended_2021.20220204-1_all.deb ...
Unpacking texlive-fonts-recommended (2021.20220204-1) ...
Selecting previously unselected package texlive-latex-base.
Preparing to unpack .../44-texlive-latex-base_2021.20220204-1_all.deb ...
Unpacking texlive-latex-base (2021.20220204-1) ...
Selecting previously unselected package libfontbox-java.
Preparing to unpack .../45-libfontbox-java_1%3a1.8.16-2_all.deb ...
Unpacking libfontbox-java (1:1.8.16-2) ...
Selecting previously unselected package libpdfbox-java.
Preparing to unpack .../46-libpdfbox-java_1%3a1.8.16-2_all.deb ...
Unpacking libpdfbox-java (1:1.8.16-2) ...
Selecting previously unselected package texlive-latex-recommended.
Preparing to unpack .../47-texlive-latex-recommended_2021.20220204-1_all.deb ...
Unpacking texlive-latex-recommended (2021.20220204-1) ...
Selecting previously unselected package texlive-pictures.
Preparing to unpack .../48-texlive-pictures_2021.20220204-1_all.deb ...
Unpacking texlive-pictures (2021.20220204-1) ...
Selecting previously unselected package texlive-latex-extra.
Preparing to unpack .../49-texlive-latex-extra_2021.20220204-1_all.deb ...
Unpacking texlive-latex-extra (2021.20220204-1) ...

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Selecting previously unselected package texlive-plain-generic.
Preparing to unpack .../50-texlive-plain-generic_2021.20220204-1_all.deb ...
Unpacking texlive-plain-generic (2021.20220204-1) ...
Selecting previously unselected package tipa.
Preparing to unpack .../51-tipa_2%3a1.3-21_all.deb ...
Unpacking tipa (2:1.3-21) ...
Selecting previously unselected package texlive-xetex.
Preparing to unpack .../52-texlive-xetex_2021.20220204-1_all.deb ...
Unpacking texlive-xetex (2021.20220204-1) ...
Setting up fonts-lato (2.0-2.1) ...
Setting up fonts-noto-mono (20201225-1build1) ...
Setting up libwoff1:amd64 (1.0.2-1build4) ...
Setting up libtexlua53:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Setting up libijs-0.35:amd64 (0.35-15build2) ...
Setting up libtexluajit2:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Setting up libfontbox-java (1:1.8.16-2) ...
Setting up rubygems-integration (1.18) ...
Setting up libzip-0-13:amd64 (0.13.72+dfsg.1-1.1) ...
Setting up fonts-urw-base35 (20200910-1) ...
Setting up poppler-data (0.4.11-1) ...
Setting up tex-common (6.17) ...
update-language: texlive-base not installed and configured, doing nothing!
Setting up libbig2dec0:amd64 (0.19-3build2) ...
Setting up libteckit0:amd64 (2.5.11+ds1-1) ...
Setting up libapache-pom-java (18-1) ...
Setting up ruby-net-telnet (0.1.1-2) ...
Setting up xfonts-encodings (1:1.0.5-0ubuntu2) ...
Setting up t1utils (1.41-4build2) ...
Setting up libidn12:amd64 (1.38-4ubuntu1) ...
Setting up fonts-texgyre (20180621-3.1) ...
Setting up libkpathsea6:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Setting up ruby-webrick (1.7.0-3ubuntu0.2) ...
Setting up fonts-lmodern (2.004.5-6.1) ...
Setting up fonts-droid-fallback (1:6.0.1r16-1.1build1) ...
Setting up ruby-xmlrpc (0.3.2-1ubuntu0.1) ...
Setting up libsynchronet2:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Setting up libgs9-common (9.55.0~dfsg1-0ubuntu5.13) ...
Setting up teckit (2.5.11+ds1-1) ...
Setting up libpdfbox-java (1:1.8.16-2) ...
Setting up libgs9:amd64 (9.55.0~dfsg1-0ubuntu5.13) ...
Setting up preview-latex-style (12.2-1ubuntu1) ...
Setting up libcommons-parent-java (43-1) ...
Setting up dvisvgm (2.13.1-1) ...
Setting up libcommons-logging-java (1.2-2) ...
Setting up xfonts-utils (1:7.7+6build2) ...
Setting up libptexenc1:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Setting up texlive-binaries (2021.20210626.59705-1ubuntu0.2) ...
update-alternatives: using /usr/bin/xdvi-xaw to provide /usr/bin/xdvi.bin

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(xdvi.bin) in auto mode
update-alternatives: using /usr/bin/bibtex.original to provide /usr/bin/bibtex
(bibtex) in auto mode
Setting up lmodern (2.004.5-6.1) ...
Setting up texlive-base (2021.20220204-1) ...
/usr/bin/ucfr
/usr/bin/ucfr
/usr/bin/ucfr
/usr/bin/ucfr
mktexlsr: Updating /var/lib/texmf/ls-R-TEXLIVEDIST...
mktexlsr: Updating /var/lib/texmf/ls-R-TEXMFMAIN...
mktexlsr: Updating /var/lib/texmf/ls-R...
mktexlsr: Done.
tl-paper: setting paper size for dvips to a4:
/var/lib/texmf/dvips/config/config-paper.ps
tl-paper: setting paper size for dvipdfmx to a4:
/var/lib/texmf/dvipdfmx/dvipdfmx-paper.cfg
tl-paper: setting paper size for xdvi to a4: /var/lib/texmf/xdvi/XDvi-paper
tl-paper: setting paper size for pdftex to a4: /var/lib/texmf/tex/generic/tex-
ini-files/pdftexconfig.tex
Setting up tex-gyre (20180621-3.1) ...
Setting up texlive-plain-generic (2021.20220204-1) ...
Setting up texlive-latex-base (2021.20220204-1) ...
Setting up texlive-latex-recommended (2021.20220204-1) ...
Setting up texlive-pictures (2021.20220204-1) ...
Setting up texlive-fonts-recommended (2021.20220204-1) ...
Setting up tipa (2:1.3-21) ...
Setting up texlive-latex-extra (2021.20220204-1) ...
Setting up texlive-xetex (2021.20220204-1) ...
Setting up rake (13.0.6-2) ...
Setting up libruby3.0:amd64 (3.0.2-7ubuntu2.11) ...
Setting up ruby3.0 (3.0.2-7ubuntu2.11) ...
Setting up ruby (1:3.0~exp1) ...
Setting up ruby-rubygems (3.3.5-2ubuntu1.2) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...
Processing triggers for libc-bin (2.35-0ubuntu3.8) ...
/sbin/ldconfig.real: /usr/local/lib/libumf.so.1 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libhwloc.so.15 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libur_adapter_opencl.so.0 is not a symbolic
link

/sbin/ldconfig.real: /usr/local/lib/libtbbbind.so.3 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libur_adapter_level_zero.so.0 is not a

```

symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtcm.so.1 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc\_proxy.so.2 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtcm\_debug.so.1 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbb.so.12 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libur\_loader.so.0 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc.so.2 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libur\_adapter\_level\_zero\_v2.so.0 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbbind\_2\_0.so.3 is not a symbolic link

/sbin/ldconfig.real: /usr/local/lib/libtbbbind\_2\_5.so.3 is not a symbolic link

Processing triggers for tex-common (6.17) ...

Running updmap-sys. This may take some time... done.

Running mktexlsr /var/lib/texmf ... done.

Building format(s) --all.

This may take some time... done.

```
[20]: from google.colab import drive
drive.mount('/content/gdrive')
```

Mounted at /content/gdrive

```
[ ]: !jupyter nbconvert --to pdf '/content/gdrive/MyDrive/Colab Notebooks/Time_
↪series project.ipynb'
```