

Tarefa 1 - Pré processamento

Dicas:

- Tutorial para iniciantes em Python: <https://www.datacamp.com/cheat-sheet/getting-started-with-python-cheat-sheet>
- você pode querer dar uma olhada na biblioteca pandas: <https://colab.research.google.com/drive/1a4sbKG7jOJGn4oeonQPA8XjJm7OYgcdX>
- A documentação do matplotlib pode te ajudar: <https://matplotlib.org/stable/index.html>

Importe os pacotes

```
import pandas as pd
import sklearn
import numpy as np
import matplotlib.pyplot as plt
```

Crie os datasets

Crie um DataFrame para cada UF, a partir do arquivo de dados disponibilizados no EaD

Dicas:

- busque a função `read_csv`, se você estiver usando pandas. Verifique os parâmetros necessários.
- certifique-se que os arquivos a serem lidos estão carregados na sua sessão do Colab, ou em um drive previamente montado, e ajuste o comando para incluir todo o caminho até cada um dos arquivos a serem lidos

```
# prompt: df=pd.read_csv('flight_data_v1.csv')
```

```
df = pd.read_csv("flight_data_v1.csv",delimiter=",")
df.head()
```

```
{"summary":{"name": "df", "rows": 301, "fields": [{"column": "Date", "properties": {"dtype": "object", "num_unique_values": 201, "samples": ["2024-12-04", "2024-03-19", "2024-10-20"], "semantic_type": "", "description": ""}, {"column": "Time", "properties": {"dtype": "object", "num_unique_values": 271, "samples": ["05:23", "15:32", "21:48"], "semantic_type": "", "description": ""}, {"column": "Departure_Airport", "properties": {"dtype": "object", "num_unique_values": 271, "samples": ["05:23", "15:32", "21:48"], "semantic_type": "", "description": ""}}]}
```

```

{"properties": {"dtype": "category",
  "num_unique_values": 30,
  "samples": ["BNA Airport",
    "LAS Airport",
    "MSP Airport",
    "semantic_type": "",
    "description": ""}],
  "column": "Arrival_Airport",
  "properties": {"dtype": "category",
    "num_unique_values": 30,
    "samples": ["CLT Airport",
      "BOS Airport",
      "DEN Airport",
      "semantic_type": "",
      "description": ""}],
    "column": "Temperature_Celsius",
    "properties": {"dtype": "number",
      "std": 17.607027507640492,
      "min": -40.0,
      "max": 40.0,
      "num_unique_values": 61,
      "samples": [35.0,
        -15.0,
        -3.0],
        "semantic_type": "",
        "description": ""}],
        "column": "Wind_Speed_knots",
        "properties": {"dtype": "number",
          "std": 14.623344810225024,
          "min": 0.0,
          "max": 50.0,
          "num_unique_values": 51,
          "samples": [10.0,
            23.0,
            14.0],
            "semantic_type": "",
            "description": ""}],
            "column": "Turbulence_Level",
            "properties": {"dtype": "category",
              "num_unique_values": 3,
              "samples": ["High",
                "Low",
                "Medium"],
                "semantic_type": "",
                "description": ""}],
                "column": "Visibility_km",
                "properties": {"dtype": "category",
                  "num_unique_values": 21,
                  "samples": ["19",
                    "9",
                    "8"],
                    "semantic_type": "",
                    "description": ""}],
                    "type": "dataframe",
                    "variable_name": "df"}

from google.colab import drive
drive.mount('/content/drive')

Mounted at /content/drive

```

Classifique as variáveis (colunas) de um dos datasets de acordo com seu tipo de atributo (Categórico - nominal ou ordinal; Numérico - intervalo ou razão)

Resposta:

- Date: numérico intervalo
- Time: numérico intervalo
- Departure_Airport: categórico nominal
- Arrival_Airport: categórico nominal
- Temperature_Celcius: numérico intervalo

- Wind_Speed_knots: numérico razão
- Turbulence_Level: categórico ordinal
- Visibility_km: numérico razão

Verificação da Qualidade dos Dados

###Verifique no dataset se existem dados faltantes

```
dados_faltantes = df.isnull().sum()
print(dados_faltantes)
```

```
Date          0
Time          0
Departure_Airport  0
Arrival_Airport  0
Temperature_Celsius  25
Wind_Speed_knots  25
Turbulence_Level  0
Visibility_km   0
dtype: int64
```

Existem dados faltantes tanto no Temperature_Celsius quanto no Wind_Speed_knots.

Se houver, trate os dados faltantes substituindo-os pela média

```
for coluna in df.columns:
    if df[coluna].dtype == 'float64' or df[coluna].dtype == 'int64':
        media_coluna = df[coluna].mean()
        df[coluna].fillna(media_coluna, inplace=True)
```

```
print(df.isnull().sum())
```

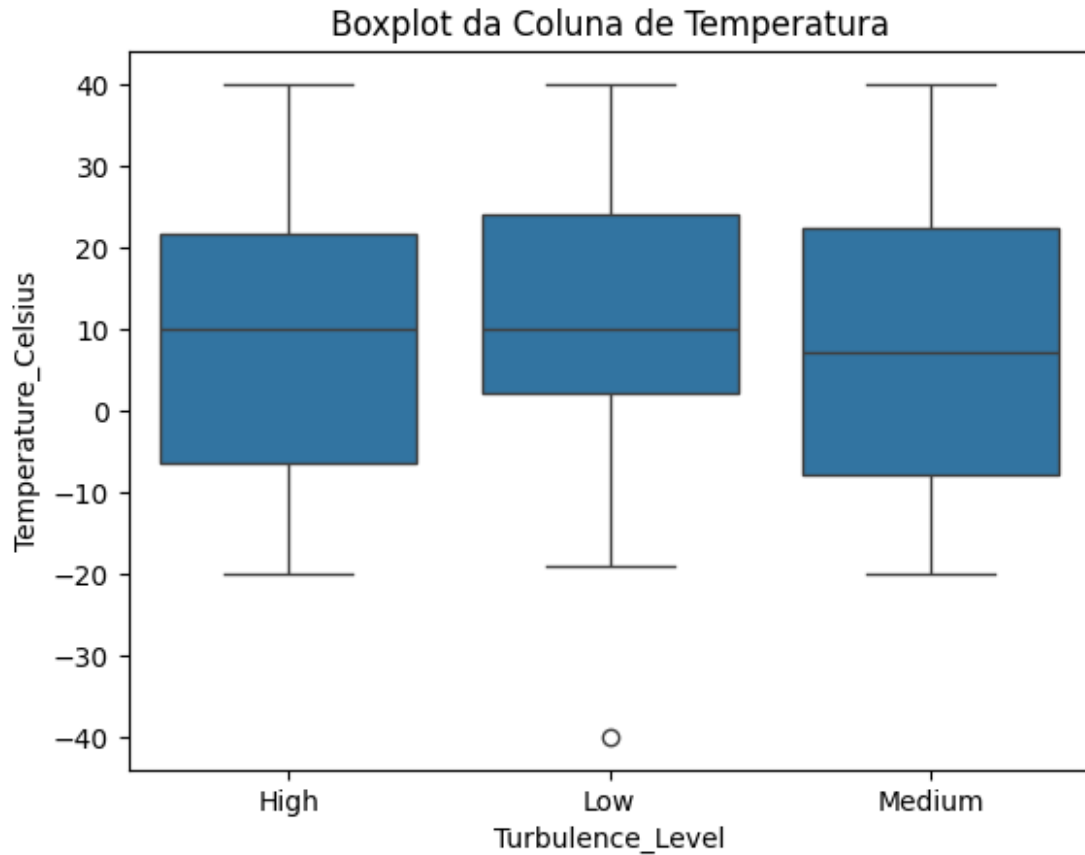
```
Date          0
Time          0
Departure_Airport  0
Arrival_Airport  0
Temperature_Celsius  0
Wind_Speed_knots  0
Turbulence_Level  0
Visibility_km   0
dtype: int64
```

Agora verifique se existem Outliers ou Noises nas features
Wind_Speed_knots e Temperature_Level

(Dica: plote um gráfico BoxPlot pra melhor visualização)

```
#visualizando os outliers ou noises
```

```
sns.boxplot(x= "Turbulence_Level",y='Temperature_Celsius', data=df)
plt.title('Boxplot da Coluna de Temperatura')
plt.show()
```



Não há a percepção de outliers no bloxplot, mas como a temperatura -40 destuou do restante, faremos o código retiranda.

```
print("Estatísticas antes da remoção de outliers:")
print(df.describe())
```

```
Estatísticas antes da remoção de outliers:
      Temperature_Celsius  Wind_Speed_knots
count          301.000000          301.000000
mean             9.300725          25.347826
std             16.857445          14.000787
min            -40.000000           0.000000
25%             -5.000000          15.000000
50%              9.300725          25.347826
75%             23.000000          36.000000
max             40.000000          50.000000
```

Se houver, retire-o

Dica: Pesquisa sobre o funcionamento do boxplot para encontrar o noise

```
def sem_outlier(df, coluna):  
    df = df[(df[coluna] >= -35)]  
    return df  
  
df = sem_outlier(df, 'Wind_Speed_knots')  
df = sem_outlier(df, 'Temperature_Celsius')  
  
print(df)
```

	Date	Time	Departure_Airport	Arrival_Airport	
Temperature_Celsius \					
0	2024-10-11	10:25	ATL Airport	SEA Airport	35.000000
1	2024-01-20	18:38	IAH Airport	AUS Airport	3.000000
2	2024-12-26	12:50	STL Airport	SEA Airport	20.000000
3	2024-08-19	07:28	MCO Airport	LAS Airport	33.000000
4	2024-12-07	07:10	LAX Airport	SEA Airport	28.000000
..
...					
295	2024-02-21	23:18	ORD Airport	TPA Airport	11.000000
296	2024-07-14	04:45	SAN Airport	MSP Airport	11.000000
297	2024-12-06	13:36	PHX Airport	DTW Airport	9.300725
298	2024-09-12	17:41	MSP Airport	MCO Airport	6.000000
299	2024-12-05	15:04	DEN Airport	BOS Airport	11.000000

	Wind_Speed_knots	Turbulence_Level	Visibility_km
0	45.000000	High	19
1	25.000000	Low	6
2	48.000000	Medium	6
3	48.000000	High	18
4	34.000000	Low	20
..
295	26.000000	Medium	11
296	28.000000	Low	15
297	25.347826	Low	12
298	41.000000	High	15
299	42.000000	Low	5

```
[300 rows x 8 columns]
```

```
print("\nEstatísticas depois da remoção de outliers:")  
print(df.describe())
```

```
Estatísticas depois da remoção de outliers:  
      Temperature_Celsius  Wind_Speed_knots  
count      300.000000      300.000000  
mean         9.465060        25.398986  
std        16.642350        13.995970  
min        -20.000000         0.000000  
25%         -5.000000        15.000000  
50%          9.300725        25.347826  
75%         23.000000        36.000000  
max         40.000000        50.000000
```

Transformação de atributos

Transforme formato da feature date para datetime

```
df[ "Date"] = pd.to_datetime(df[ "Date"])
```

```
df[ "Date"].head()
```

```
0    2024-10-11  
1    2024-01-20  
2    2024-12-26  
3    2024-08-19  
4    2024-12-07
```

```
Name: Date, dtype: datetime64[ns]
```

Aplique Normalização em [0,1] (segundo o método min-max) nas features

1. List item
2. List item

Wind_Speeds_knots e Temperature_Celsius. Dica: Guarde os novos valores em novas features, para manter a proveniência e rastreabilidade.

```
from sklearn.preprocessing import MinMaxScaler  
df_normalizado= df.copy()  
  
scaler = MinMaxScaler()  
  
df_normalizado[ 'Wind_Speed_knots_normalizado' ] =  
scaler.fit_transform(df_normalizado[ [ 'Wind_Speed_knots' ] ])
```

```
df_normalizado['Temperature_Celsius_normalizado'] =
scaler.fit_transform(df_normalizado[['Temperature_Celsius']])

print(df_normalizado.head())
```

	Date	Time	Departure_Airport	Arrival_Airport
0	2024-10-11	10:25	ATL Airport	SEA Airport
1	2024-01-20	18:38	IAH Airport	AUS Airport
2	2024-12-26	12:50	STL Airport	SEA Airport
3	2024-08-19	07:28	MCO Airport	LAS Airport
4	2024-12-07	07:10	LAX Airport	SEA Airport

	Wind_Speed_knots	Turbulence_Level	Visibility_km
0	45.0	High	19
1	25.0	Low	6
2	48.0	Medium	6
3	48.0	High	18
4	34.0	Low	20

	Wind_Speed_knots_normalizado	Temperature_Celsius_normalizado
0	0.90	0.916667
1	0.50	0.383333
2	0.96	0.666667
3	0.96	0.883333
4	0.68	0.800000

Aplique Discretização na temperatura desse dataset

Implemente a discretização da temperatura. Defina os intervalos e os rótulos para as categorias de discretização conforme achar apropriado.

```
import pandas as pd

df_normalizado['Wind_Speed_knots_normalizado'] =
scaler.fit_transform(df_normalizado[['Wind_Speed_knots']])
df_normalizado['Temperature_Celsius_normalizado'] =
scaler.fit_transform(df_normalizado[['Temperature_Celsius']])
bins = [-float('inf'), 0, 15, 22, 33, float('inf')] # Exemplo de
intervalos em graus Celsius
labels = ['Muito Frio', 'Frio', 'Moderado', 'Quente', 'Muito Quente']
df_normalizado['categoria_temperatura_celsius'] =
pd.cut(df_normalizado['Temperature_Celsius'], bins=bins,
labels=labels, right=False)
```

```
print(df_normalizado)
```

	Date	Time	Departure_Airport	Arrival_Airport	Temperature_Celsius \
0	2024-10-11	10:25	ATL Airport	SEA Airport	35.000000
1	2024-01-20	18:38	IAH Airport	AUS Airport	3.000000
2	2024-12-26	12:50	STL Airport	SEA Airport	20.000000
3	2024-08-19	07:28	MCO Airport	LAS Airport	33.000000
4	2024-12-07	07:10	LAX Airport	SEA Airport	28.000000
..
295	2024-02-21	23:18	ORD Airport	TPA Airport	11.000000
296	2024-07-14	04:45	SAN Airport	MSP Airport	11.000000
297	2024-12-06	13:36	PHX Airport	DTW Airport	9.300725
298	2024-09-12	17:41	MSP Airport	MCO Airport	6.000000
299	2024-12-05	15:04	DEN Airport	BOS Airport	11.000000

	Wind_Speed_knots	Turbulence_Level	Visibility_km \
0	45.000000	High	19
1	25.000000	Low	6
2	48.000000	Medium	6
3	48.000000	High	18
4	34.000000	Low	20
..
295	26.000000	Medium	11
296	28.000000	Low	15
297	25.347826	Low	12
298	41.000000	High	15
299	42.000000	Low	5

	Wind_Speed_knots_normalizado	Temperature_Celsius_normalizado \
0	0.900000	0.916667
1	0.500000	0.383333
2	0.960000	0.666667
3	0.960000	0.883333
4	0.680000	0.800000
..
295	0.520000	0.516667
296	0.560000	0.150000

297	0.506957	0.488345
298	0.820000	0.433333
299	0.840000	0.516667

```

categoria_temperatura_celsius
0          Muito Quente
1              Frio
2          Moderado
3          Muito Quente
4              Quente
..          ...
295         Frio
296         Muito Frio
297         Frio
298         Frio
299         Frio

```

```
[300 rows x 11 columns]
```

Visualização dos Dados

Construa um gráfico para visualizar informações da base integrada. Por exemplo, você pode plotar a distribuição da temperatura discretizada por nível de turbulência ou um gráfico que mostre a variação da velocidade do vento ao longo de um mês

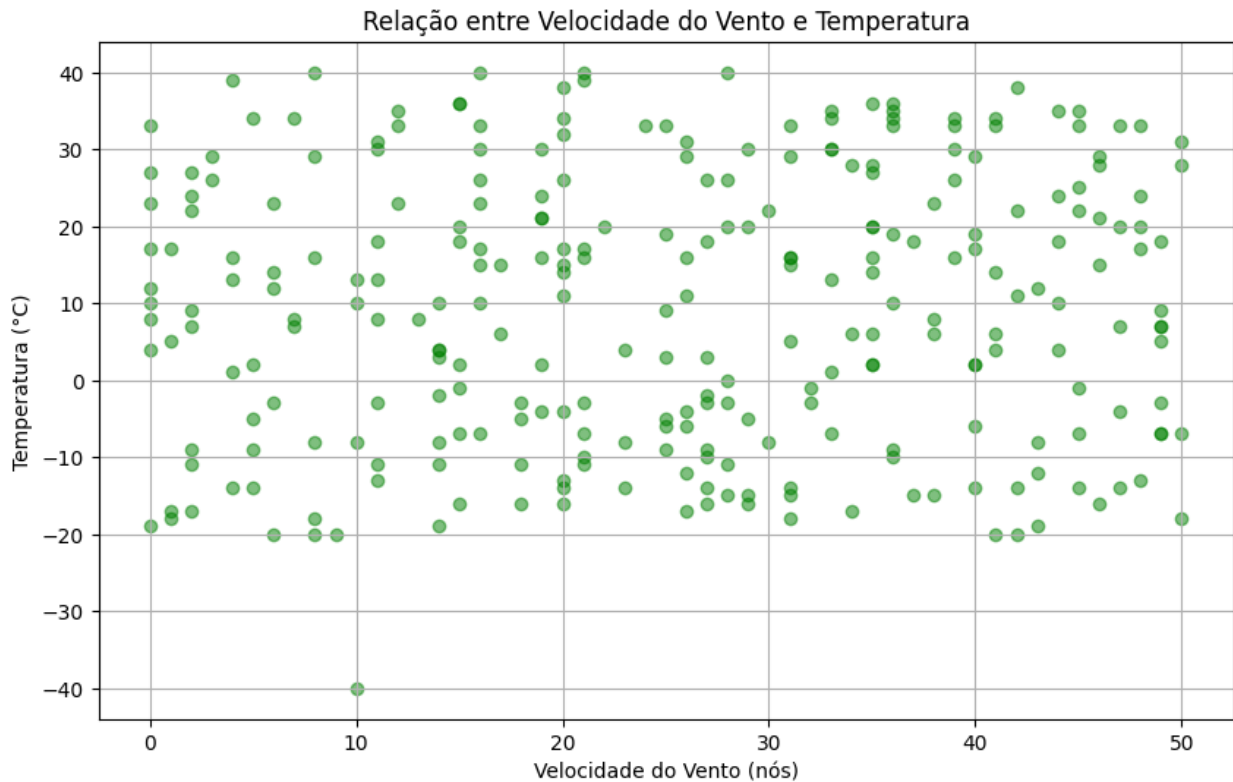
```

import pandas as pd
import matplotlib.pyplot as plt

# Carregar o arquivo CSV
dados = pd.read_csv('flight_data_v1.csv', sep = ',')

# Plotar o gráfico de dispersão
plt.figure(figsize=(10, 6))
plt.scatter(dados['Wind_Speed_knots'], dados['Temperature_Celsius'],
            color='green', alpha=0.5)
plt.title('Relação entre Velocidade do Vento e Temperatura')
plt.xlabel('Velocidade do Vento (nós)')
plt.ylabel('Temperatura (°C)')
plt.grid(True)
plt.show()

```



Gere o PDF

Para entregar o exercício, você pode simplesmente selecionar a opção de "Imprimir" no menu "Arquivo" (e selecionar para imprimir em PDF), ou tentar usar pacotes de conversão para PDF. Seguem abaixo alguns comandos neste sentido, mas que infelizmente não funcionam em todos os sistemas operacionais (a princípio, funcionam no Windows)

```
import nbconvert

!sudo 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 libfontenc1 libgs9 libgs9-common
  libidn12 libijs-0.35 libjbig2dec0 libkpathsea6 libpdfbox-java libptexenc1
  libruby3.0 libsyntaxtex2 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 tlutils 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 libfontenc1 libgs9 libgs9-
common

libidn12 libijs-0.35 libjbig2dec0 libkpathsea6 libpdfbox-java
libptexenc1

libruby3.0 libsynchronet2 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 tlutils 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, 54 newly installed, 0 to remove and 38 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](http://archive.ubuntu.com/ubuntu/jammy/main amd64 fonts-droid-fallback all 1:6.0.1r16-1.1build1) all 1:6.0.1r16-1.1build1 [1,805 kB]

Get:2 [http://security.ubuntu.com/ubuntu/jammy-security/main amd64 libkpathsea6](http://security.ubuntu.com/ubuntu/jammy-security/main amd64 libkpathsea6 amd64 2021.20210626.59705-1ubuntu0.2) amd64 2021.20210626.59705-1ubuntu0.2 [60.4 kB]

Get:3 [http://archive.ubuntu.com/ubuntu/jammy/main amd64 fonts-lato](http://archive.ubuntu.com/ubuntu/jammy/main amd64 fonts-lato all 2.0-2.1) all 2.0-2.1 [2,696 kB]

Get:4 <http://archive.ubuntu.com/ubuntu/jammy/main amd64 poppler-data>

all 0.4.11-1 [2,171 kB]
Get:5 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 tex-common
all 6.17 [33.7 kB]
Get:6 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 fonts-urw-
base35 all 20200910-1 [6,367 kB]
Get:7 <http://security.ubuntu.com/ubuntu> jammy-security/main amd64
libptexenc1 amd64 2021.20210626.59705-1ubuntu0.2 [39.1 kB]
Get:8 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64
libgs9-common all 9.55.0~dfsg1-0ubuntu5.6 [751 kB]
Get:9 <http://security.ubuntu.com/ubuntu> jammy-security/main amd64
libsyntax2 amd64 2021.20210626.59705-1ubuntu0.2 [55.6 kB]
Get:10 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64
libidn12 amd64 1.38-4ubuntu1 [60.0 kB]
Get:11 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 libijs-0.35
amd64 0.35-15build2 [16.5 kB]
Get:12 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 libjbig2dec0
amd64 0.19-3build2 [64.7 kB]
Get:13 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64
libgs9 amd64 9.55.0~dfsg1-0ubuntu5.6 [5,031 kB]
Get:14 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 libwoff1
amd64 1.0.2-1build4 [45.2 kB]
Get:15 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 dvisvgm
amd64 2.13.1-1 [1,221 kB]
Get:16 <http://security.ubuntu.com/ubuntu> jammy-security/main amd64
libtexlua53 amd64 2021.20210626.59705-1ubuntu0.2 [120 kB]
Get:17 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 fonts-
lmodern all 2.004.5-6.1 [4,532 kB]
Get:18 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 fonts-noto-
mono all 20201225-1build1 [397 kB]
Get:19 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64 fonts-
texgyre all 20180621-3.1 [10.2 MB]
Get:20 <http://security.ubuntu.com/ubuntu> jammy-security/main amd64
libtexluajit2 amd64 2021.20210626.59705-1ubuntu0.2 [267 kB]
Get:21 <http://security.ubuntu.com/ubuntu> jammy-security/universe amd64
texlive-binaries amd64 2021.20210626.59705-1ubuntu0.2 [9,860 kB]
Get:22 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64
libapache-pom-java all 18-1 [4,720 B]
Get:23 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64
libcommons-parent-java all 43-1 [10.8 kB]
Get:24 <http://archive.ubuntu.com/ubuntu> jammy/universe amd64
libcommons-logging-java all 1.2-2 [60.3 kB]
Get:25 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 libfontenc1
amd64 1:1.1.4-1build3 [14.7 kB]
Get:26 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 rubygems-
integration all 1.18 [5,336 B]
Get:27 <http://archive.ubuntu.com/ubuntu> jammy-updates/main amd64
ruby3.0 amd64 3.0.2-7ubuntu2.4 [50.1 kB]
Get:28 <http://archive.ubuntu.com/ubuntu> jammy/main amd64 ruby-rubygems
all 3.3.5-2 [228 kB]

```
Get:29 http://archive.ubuntu.com/ubuntu jammy/main amd64 ruby amd64
1:3.0~exp1 [5,100 B]
Get:30 http://archive.ubuntu.com/ubuntu jammy/main amd64 rake all
13.0.6-2 [61.7 kB]
Get:31 http://archive.ubuntu.com/ubuntu jammy/main amd64 ruby-net-
telnet all 0.1.1-2 [12.6 kB]
Get:32 http://archive.ubuntu.com/ubuntu jammy/universe amd64 ruby-
webrick all 1.7.0-3 [51.8 kB]
Get:33 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby-
xmlrpc all 0.3.2-1ubuntu0.1 [24.9 kB]
Get:34 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64
libruby3.0 amd64 3.0.2-7ubuntu2.4 [5,113 kB]
Get:35 http://archive.ubuntu.com/ubuntu jammy/universe amd64
libteckit0 amd64 2.5.11+ds1-1 [421 kB]
Get:36 http://archive.ubuntu.com/ubuntu jammy/universe amd64 libzip-
0-13 amd64 0.13.72+dfsg.1-1.1 [27.0 kB]
Get:37 http://archive.ubuntu.com/ubuntu jammy/main amd64 xfonts-
encodings all 1:1.0.5-0ubuntu2 [578 kB]
Get:38 http://archive.ubuntu.com/ubuntu jammy/main amd64 xfonts-utils
amd64 1:7.7+6build2 [94.6 kB]
Get:39 http://archive.ubuntu.com/ubuntu jammy/universe amd64 lmodern
all 2.004.5-6.1 [9,471 kB]
Get:40 http://archive.ubuntu.com/ubuntu jammy/universe amd64 preview-
latex-style all 12.2-1ubuntu1 [185 kB]
Get:41 http://archive.ubuntu.com/ubuntu jammy/main amd64 tlutils amd64
1.41-4build2 [61.3 kB]
Get:42 http://archive.ubuntu.com/ubuntu jammy/universe amd64 teckit
amd64 2.5.11+ds1-1 [699 kB]
Get:43 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tex-gyre
all 20180621-3.1 [6,209 kB]
Get:44 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
base all 2021.20220204-1 [21.0 MB]
Get:45 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
fonts-recommended all 2021.20220204-1 [4,972 kB]
Get:46 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
latex-base all 2021.20220204-1 [1,128 kB]
Get:47 http://archive.ubuntu.com/ubuntu jammy/universe amd64
libfontbox-java all 1:1.8.16-2 [207 kB]
Get:48 http://archive.ubuntu.com/ubuntu jammy/universe amd64
libpdfbox-java all 1:1.8.16-2 [5,199 kB]
Get:49 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
latex-recommended all 2021.20220204-1 [14.4 MB]
Get:50 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
pictures all 2021.20220204-1 [8,720 kB]
Get:51 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
latex-extra all 2021.20220204-1 [13.9 MB]
Get:52 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
plain-generic all 2021.20220204-1 [27.5 MB]
Get:53 http://archive.ubuntu.com/ubuntu jammy/universe amd64 tipa all
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2:1.3-21 [2,967 kB]
Get:54 http://archive.ubuntu.com/ubuntu jammy/universe amd64 texlive-
xetex all 2021.20220204-1 [12.4 MB]
Fetched 182 MB in 3s (57.9 MB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog
based frontend cannot be used. at
/usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 78, <> line 54.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
Selecting previously unselected package fonts-droid-fallback.
(Reading database ... 121752 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) ...
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-
0ubuntu5.6_all.deb ...
Unpacking libgs9-common (9.55.0~dfsg1-0ubuntu5.6) ...
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-
0ubuntu5.6_amd64.deb ...
Unpacking libgs9:amd64 (9.55.0~dfsg1-0ubuntu5.6) ...
Selecting previously unselected package libkpathsea6:amd64.
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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 libfontenc1:amd64.
Preparing to unpack .../19-libfontenc1_1%3a1.1.4-1build3_amd64.deb ...
Unpacking libfontenc1:amd64 (1:1.1.4-1build3) ...
Selecting previously unselected package libptexenc1:amd64.
Preparing to unpack .../20-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 .../21-rubygems-integration_1.18_all.deb ...
Unpacking rubygems-integration (1.18) ...
Selecting previously unselected package ruby3.0.
Preparing to unpack .../22-ruby3.0_3.0.2-7ubuntu2.4_amd64.deb ...
Unpacking ruby3.0 (3.0.2-7ubuntu2.4) ...
Selecting previously unselected package ruby-rubygems.
Preparing to unpack .../23-ruby-rubygems_3.3.5-2_all.deb ...
Unpacking ruby-rubygems (3.3.5-2) ...
Selecting previously unselected package ruby.
Preparing to unpack .../24-ruby_1%3a3.0~exp1_amd64.deb ...
Unpacking ruby (1:3.0~exp1) ...
Selecting previously unselected package rake.
Preparing to unpack .../25-rake_13.0.6-2_all.deb ...
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Unpacking rake (13.0.6-2) ...
Selecting previously unselected package ruby-net-telnet.
Preparing to unpack .../26-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 .../27-ruby-webrick_1.7.0-3_all.deb ...
Unpacking ruby-webrick (1.7.0-3) ...
Selecting previously unselected package ruby-xmlrpc.
Preparing to unpack .../28-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 .../29-libruby3.0_3.0.2-7ubuntu2.4_amd64.deb ...
Unpacking libruby3.0:amd64 (3.0.2-7ubuntu2.4) ...
Selecting previously unselected package libsyntax2:amd64.
Preparing to unpack .../30-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 .../31-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 .../32-libtexlua53_2021.20210626.59705-1ubuntu0.2_amd64.deb ...
Unpacking libtexlua53:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package libtexluaajit2:amd64.
Preparing to unpack .../33-libtexluaajit2_2021.20210626.59705-1ubuntu0.2_amd64.deb ...
Unpacking libtexluaajit2:amd64 (2021.20210626.59705-1ubuntu0.2) ...
Selecting previously unselected package libzip-0-13:amd64.
Preparing to unpack .../34-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.
Preparing to unpack .../35-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 .../36-xfonts-utils_1%3a7.7+6build2_amd64.deb ...
Unpacking xfonts-utils (1:7.7+6build2) ...
Selecting previously unselected package lmodern.
Preparing to unpack .../37-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 .../38-preview-latex-style_12.2-1ubuntu1_all.deb ...
Unpacking preview-latex-style (12.2-1ubuntu1) ...
Selecting previously unselected package tlutils.
Preparing to unpack .../39-tlutils_1.41-4build2_amd64.deb ...
Unpacking tlutils (1.41-4build2) ...
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Selecting previously unselected package teckit.  
Preparing to unpack .../40-teckit_2.5.11+ds1-1_amd64.deb ...  
Unpacking teckit (2.5.11+ds1-1) ...  
Selecting previously unselected package tex-gyre.  
Preparing to unpack .../41-tex-gyre_20180621-3.1_all.deb ...  
Unpacking tex-gyre (20180621-3.1) ...  
Selecting previously unselected package texlive-binaries.  
Preparing to unpack .../42-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 .../43-texlive-base_2021.20220204-1_all.deb ...  
Unpacking texlive-base (2021.20220204-1) ...  
Selecting previously unselected package texlive-fonts-recommended.  
Preparing to unpack .../44-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 .../45-texlive-latex-base_2021.20220204-1_all.deb ...  
Unpacking texlive-latex-base (2021.20220204-1) ...  
Selecting previously unselected package libfontbox-java.  
Preparing to unpack .../46-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 .../47-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 .../48-texlive-latex-recommended_2021.20220204-1_all.deb ...  
Unpacking texlive-latex-recommended (2021.20220204-1) ...  
Selecting previously unselected package texlive-pictures.  
Preparing to unpack .../49-texlive-pictures_2021.20220204-1_all.deb ...  
Unpacking texlive-pictures (2021.20220204-1) ...  
Selecting previously unselected package texlive-latex-extra.  
Preparing to unpack .../50-texlive-latex-extra_2021.20220204-1_all.deb ...  
Unpacking texlive-latex-extra (2021.20220204-1) ...  
Selecting previously unselected package texlive-plain-generic.  
Preparing to unpack .../51-texlive-plain-generic_2021.20220204-1_all.deb ...  
Unpacking texlive-plain-generic (2021.20220204-1) ...  
Selecting previously unselected package tipa.  
Preparing to unpack .../52-tipa_2%3a1.3-21_all.deb ...  
Unpacking tipa (2:1.3-21) ...  
Selecting previously unselected package texlive-xetex.  
Preparing to unpack .../53-texlive-xetex_2021.20220204-1_all.deb ...  
Unpacking texlive-xetex (2021.20220204-1) ...
```

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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 libzzip-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) ...
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog
based frontend cannot be used. at
/usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 78.)
debconf: falling back to frontend: Readline
update-language: texlive-base not installed and configured, doing
nothing!
Setting up libfontenc1:amd64 (1:1.1.4-1build3) ...
Setting up libjbig2dec0: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 tlutils (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 (1.7.0-3) ...
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~dfsg1-0ubuntu5.6) ...
Setting up teckit (2.5.11+ds1-1) ...
Setting up libpdfbox-java (1:1.8.16-2) ...
Setting up libgs9:amd64 (9.55.0~dfsg1-0ubuntu5.6) ...
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 (xdvi.bin) in auto mode
update-alternatives: using /usr/bin/bibtex.original to provide
/usr/bin/bibtex (bibtex) in auto mode
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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
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog
based frontend cannot be used. at
/usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 78.)
debconf: falling back to frontend: Readline
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 (3.0.2-7ubuntu2.4) ...
Setting up ruby3.0 (3.0.2-7ubuntu2.4) ...
Setting up ruby (1:3.0~exp1) ...
Setting up ruby-rubygems (3.3.5-2) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...
Processing triggers for libc-bin (2.35-0ubuntu3.4) ...
/sbin/ldconfig.real: /usr/local/lib/libtbbmalloc.so.2 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/libtbbbind_2_0.so.3 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/libtbbbind_2_5.so.3 is not a symbolic link

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

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

debconf: unable to initialize frontend: Dialog

debconf: (No usable dialog-like program is installed, so the dialog based frontend cannot be used. at

/usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 78.)

debconf: falling back to frontend: Readline

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.

No comando abaixo, substitua o último parâmetro pelo caminho+nome do seu notebook

!jupyter nbconvert --to pdf /content/Notebook-PreProcessamento.ipynb