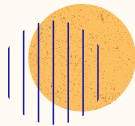




Como utilizar o **Google Colab**



Acessando a plataforma

<https://colab.research.google.com>

Olá, este é o Colaboratory

Arquivo Editar Ver Inserir Ambiente de execução Ferramentas Ajuda

+ Código + Texto Copiar para o Drive

Conectar Editar

Índice

- Primeiros passos
- Ciência de dados
- Machine learning
- Mais recursos
- Exemplos de machine learning
- Seção

O que é o Colaboratory?

O Colaboratory ou "Colab" permite escrever código Python no seu navegador, com:

- Nenhuma configuração necessária
- Acesso gratuito a GPUs
- Compartilhamento fácil

Você pode ser um **estudante**, um **cientista de dados** ou um **pesquisador de IA**, o Colab pode facilitar seu trabalho. Assista ao vídeo [Introdução ao Colab](#) para saber mais ou simplesmente comece a usá-lo abaixo!

Primeiros passos

O documento que você está lendo não é uma página da Web estática, mas sim um ambiente interativo chamado **notebook Colab** que permite escrever e executar código.

Por exemplo, aqui está uma **célula de código** com um breve script Python que calcula um valor, armazena-o em uma variável e imprime o resultado:

```
[ ] seconds_in_a_day = 24 * 60 * 60
seconds_in_a_day
```

86400

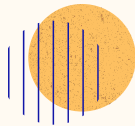
Para executar o código na célula acima, clique nela e depois pressione o botão Play à esquerda do código ou use o atalho do teclado "Command/Ctrl+Enter". Para editar o código, basta clicar na célula e começar a editar.

As variáveis definidas em uma célula podem ser usadas mais tarde em outras células:

```
[ ] seconds_in_a_week = 7 * seconds_in_a_day
seconds_in_a_week
```

604800

Os notebooks do Colab permitem combinar **código executável** e **rich text** em um só documento, além de **Imagens**, **HTML**, **LaTeX** e muito mais.



Criando um novo notebook

The screenshot shows the Google Colaboratory web interface. At the top, there's a header with the Colab logo and the text "Olá, este é o Colaboratory". Below this is a menu bar with options like "Arquivo", "Editar", "Ver", "Inserir", "Ambiente de execução", "Ferramentas", and "Ajuda". On the right side of the header, there are buttons for "Compartilhar", "Conectar", "Editar", and a user profile icon.

The left sidebar contains a file explorer with a list of actions: "Novo notebook", "Abrir notebook", "Fazer upload de notebook", "Rename", "Salvar uma cópia no Drive", "Salvar uma cópia como Gist do GitHub", "Salvar uma cópia no GitHub", "Salvar", "Histórico de revisões", "Fazer download", and "Imprimir".

The main area of the interface displays the content of a notebook. It starts with the title "O que é o Colaboratory?" and a paragraph explaining that Colab is a web-based environment for writing and running Python code. It mentions that Colab is free for students, data scientists, and AI researchers, and provides a link to a video introduction.

Below the text, there's a section titled "Primeiros passos" (First steps). It explains that the document is an interactive notebook where code can be written and executed. It provides an example of a code cell that calculates the number of seconds in a day (24 * 60 * 60) and prints the result (86400).

The code cell is shown with the following content:

```
[ ] seconds_in_a_day = 24 * 60 * 60
    seconds_in_a_day
```

Below the code, the output is displayed as "86400".

Further down, the text explains how to execute the code by clicking the Play button or using the keyboard shortcut "Command/Ctrl+Enter". It also mentions that variables defined in one cell can be used in other cells.

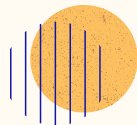
Another code cell is shown, calculating the number of seconds in a week (7 * seconds_in_a_day) and printing the result (604800).

The code cell is shown with the following content:

```
[ ] seconds_in_a_week = 7 * seconds_in_a_day
    seconds_in_a_week
```

Below the code, the output is displayed as "604800".

At the bottom of the notebook, there's a concluding sentence: "Os notebooks do Colab permitem combinar código executável e rich text em um só documento, além de imagens, HTML, LaTeX e muito mais."



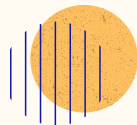
Fazendo o upload de um notebook (máquina)

The screenshot shows the JupyterLab interface with the 'Upload' tab selected. A file selection dialog is open, displaying a list of files in the 'tcc_case_study_tutorial' directory. The file 'PythonBasics.ipynb' is highlighted.

File Selection Dialog:

Nome	Tamanho	Tipo	Modificado
data			12:43 AM
PythonBasics.ipynb	10.8 kB	Documentado	1:50 PM
BinaryClassification.ipynb	10.0 kB	Documentado	1:17 PM
ExploratoryDataAnalysis.ipynb	38.5 kB	Documentado	3:16 AM

The file selection dialog also includes a sidebar with navigation options: Recentes, Pasta pessoal, Área de trabalho, Documentos, Downloads, Imagens, and Música. The file type filter is set to '*.IPYNB;*.ipynb'.



Fazendo o upload de um notebook (GitHub)

The image shows a JupyterLab interface with a dark theme. The top menu bar includes 'Arquivo', 'Editar', 'Ver', 'Inserir', 'Ambiente de execução', 'Ferramentas', and 'Ajuda'. The 'Arquivo' menu is open, showing options like 'Ver no GitHub', 'Novo notebook', 'Abrir notebook', 'Fazer upload de notebook' (highlighted with a yellow box), 'Rename', 'Salvar uma cópia no Drive', 'Salvar uma cópia como Gist do GitHub', 'Salvar uma cópia no GitHub', 'Salvar', 'Histórico de revisões', 'Fazer download', and 'Imprimir'. The main area displays a notebook titled 'ExploratoryDataAnalysis.ipynb' with code for data analysis. A 'GitHub' dialog box is open, showing a list of repositories. The 'GitHub' tab is selected, and the repository 'LucasRotsen/tcc_case_study_tutorial' is chosen. The 'ExploratoryDataAnalysis.ipynb' notebook is highlighted in the list, and the 'Abrir notebook' button is visible. The dialog box also includes a search bar, a checkbox for 'Incluir repositórios particulares', and a 'Cancelar' button.

ExploratoryDataAnalysis.ipynb

Arquivo Editar Ver Inserir Ambiente de execução Ferramentas Ajuda

Ver no GitHub

Novo notebook

Abrir notebook

Fazer upload de notebook

Rename

Salvar uma cópia no Drive

Salvar uma cópia como Gist do GitHub

Salvar uma cópia no GitHub

Salvar

Histórico de revisões

Fazer download

Imprimir

Análise exploratória dos dados

Colunas presentes

```
[ ] list(df.columns)
```

Quantidade de observações

```
[ ] df.shape[0]
```

Visualizando amostra por coluna

```
[ ] df[df['label'] == 'spam'].head(5)
```

ExploratoryDataAnalysis.ipynb

Arquivo Editar Ver Inserir Ambiente de execução Ferramentas Ajuda

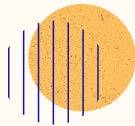
+ Código + Texto Copiar para o Drive

Área de imports

```
[ ] import pandas as pd
import seaborn as sns
import textblob as hero
import matplotlib.pyplot as plt
```

Carregamento dos dados

```
[ ] df = pd.read_csv('./data/SMSSpamCollection.txt', sep='<div data-bbox="500 560 800 940" data-label="Complex-Block"><div>Exemplos</div><div>Recente</div><div>Google Drive</div><div>GitHub</div><div>Upload</div><div>Inserir um URL do GitHub ou pesquisar por organização ou usuário</div><div>https://github.com/LucasRotsen/tcc_case_study_tutorial</div><div>Repositório: LucasRotsen/tcc_case_study_tutorial</div><div>Ramificação: main</div><div>Pasta</div><div>BinaryClassification.ipynb</div><div>ExploratoryDataAnalysis.ipynb</div><div>PythonBasics.ipynb</div><div>Abrir notebook</div><div>Cancelar</div></div>
```

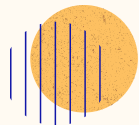


Conectando ao Google Drive

The screenshot shows a Google Colab notebook interface. The top bar includes the Colab logo, the file name 'Untitled1.ipynb', and various menu options like 'Arquivo', 'Editar', 'Ver', 'Inserir', 'Ambiente de execução', 'Ferramentas', and 'Ajuda'. On the right, there are links for 'Comentário', 'Compartilhar', and a settings icon. Below the top bar, the left sidebar shows a file explorer with a tree view containing 'drive', 'MyDrive', and 'sample_data'. The main area is a code editor with a dark theme. It contains a code cell with the following Python code:

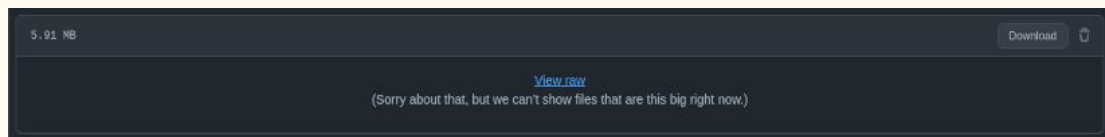
```
from google.colab import drive
drive.mount('/content/drive')
```

Below the code, the output shows 'Mounted at /content/drive'. The bottom status bar indicates '26s' and 'conclusão: 15:09'. The bottom right corner shows a 'Disco' (Disk) usage bar with 'Disponível: 70.74 GB'.

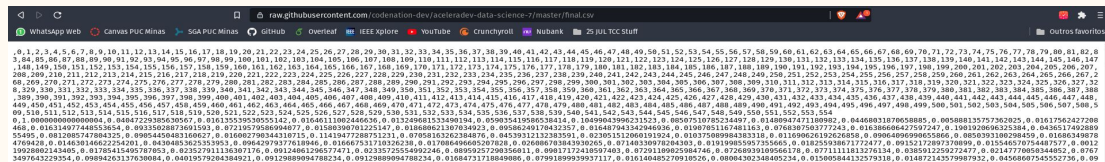


Acessando o dataset - via URL do GitHub

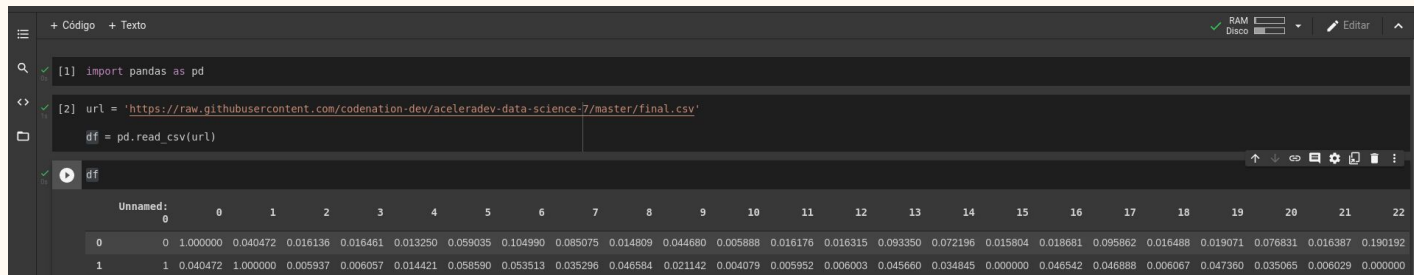
1. Acesse, no GitHub, o(s) arquivo(s) contendo o dataset.
2. Clique para visualizar o arquivo em modo “raw”
3. Copie o link
4. Carregue os dados a partir da URL no pandas



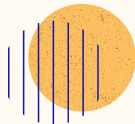
(1)



(2)



(3)



Acessando o dataset - via Google Drive

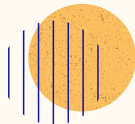
The screenshot displays a Jupyter Notebook environment with the following components:

- File Explorer (Left Panel):** Shows a directory tree with folders like 'bin', 'boot', 'content', 'drive', 'MyDrive', 'Backups', 'Casal', 'Colab Notebooks', 'Cursos Workshops', 'Engenharia de Software', 'Familia Buscapé', 'Livros', 'MF App', 'Omnilogic', 'Pessoal', 'TCC Case Study' (containing 'embold_test.json', 'embold_train.json', 'embold_train_extra...'), 'TCC Case Study - Files', 'WhatsApp Image 2021...', 'sample_data', 'datalab', 'dev', 'etc', 'home', 'lib', 'lib32', 'lib64', 'media', and 'mnt'. A status bar at the bottom indicates 'Disco Disponível: 70.65 GB'.
- Code Editor (Main Area):** Contains two code cells:
 - Cell 1:

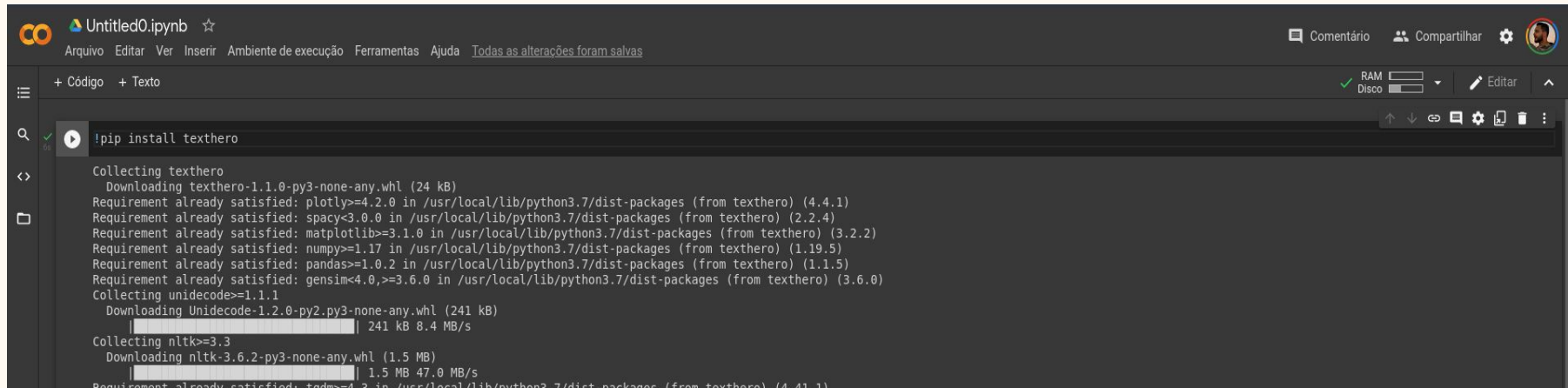
```
[1] from google.colab import drive  
drive.mount('/content/drive')
```

 The output shows 'Mounted at /content/drive'.
 - Cell 2:

```
[2] import pandas as pd  
  
pd.read_csv('/content/drive/MyDrive/TCC Case Study/embold_train.json')
```
- Top Bar:** Includes the Jupyter logo, 'Untitled1.ipynb', and navigation links: 'Arquivo', 'Editar', 'Ver', 'Inserir', 'Ambiente de execução', 'Ferramentas', and 'Ajuda'. On the right, there are links for 'Comentário', 'Compartilhar', and a user profile icon.
- Bottom Status Bar:** Shows the execution state: 'Em execução (19s) Cell > read_csv() > _read() > read() > _get_empty_meta() > <dictcomp> > __init__() > sanitize_array() > _try_cast() > maybe_cast_to_datetime() > is_datetime64tz_dtype() > is_dtype() > _check()'.



Instalando pacotes



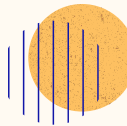
```
Untitled0.ipynb ☆
Arquivo Editar Ver Inserir Ambiente de execução Ferramentas Ajuda Todas as alterações foram salvas

+ Código + Texto
RAM
Disco
Editar

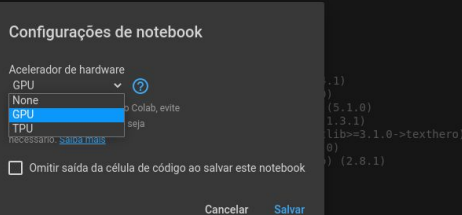
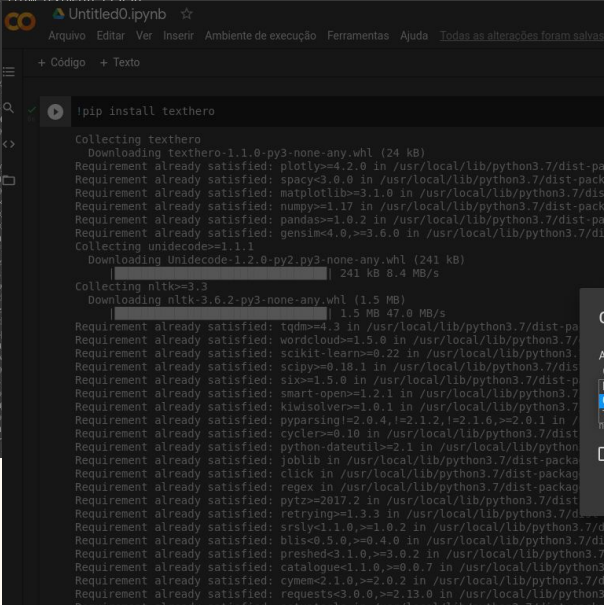
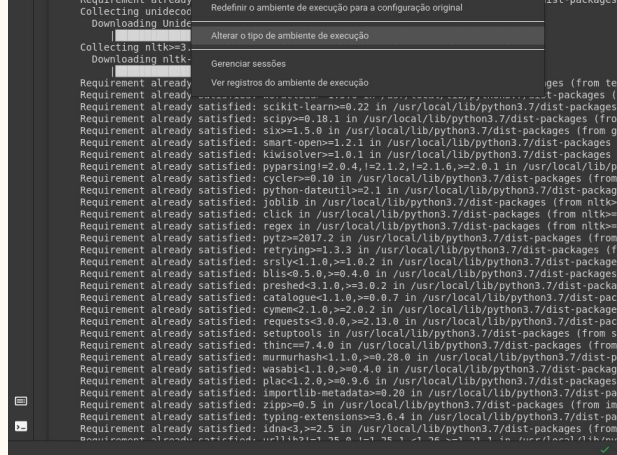
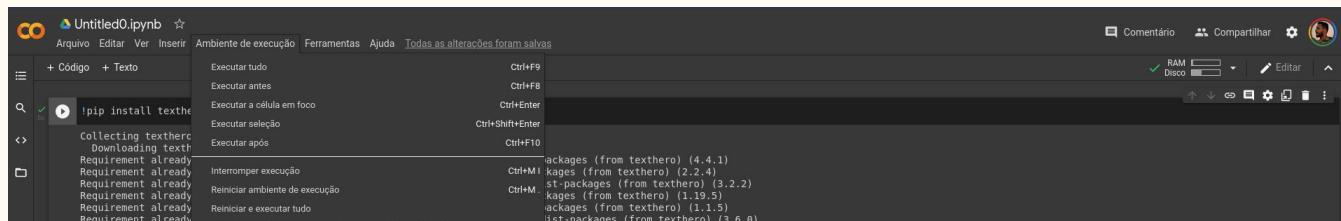
!pip install texthero

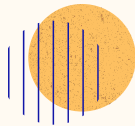
Collecting texthero
  Downloading texthero-1.1.0-py3-none-any.whl (24 kB)
Requirement already satisfied: plotly>=4.2.0 in /usr/local/lib/python3.7/dist-packages (from texthero) (4.4.1)
Requirement already satisfied: spacy<3.0.0 in /usr/local/lib/python3.7/dist-packages (from texthero) (2.2.4)
Requirement already satisfied: matplotlib>=3.1.0 in /usr/local/lib/python3.7/dist-packages (from texthero) (3.2.2)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.7/dist-packages (from texthero) (1.19.5)
Requirement already satisfied: pandas>=1.0.2 in /usr/local/lib/python3.7/dist-packages (from texthero) (1.1.5)
Requirement already satisfied: gensim<4.0,>=3.6.0 in /usr/local/lib/python3.7/dist-packages (from texthero) (3.6.0)
Collecting unicode>=1.1.1
  Downloading Unidecode-1.2.0-py2.py3-none-any.whl (241 kB)
    241 kB 8.4 MB/s
Collecting nltk>=3.3
  Downloading nltk-3.6.2-py3-none-any.whl (1.5 MB)
    1.5 MB 47.0 MB/s
Requirement already satisfied: tqdm>=4.3 in /usr/local/lib/python3.7/dist-packages (from texthero) (4.41.1)
```



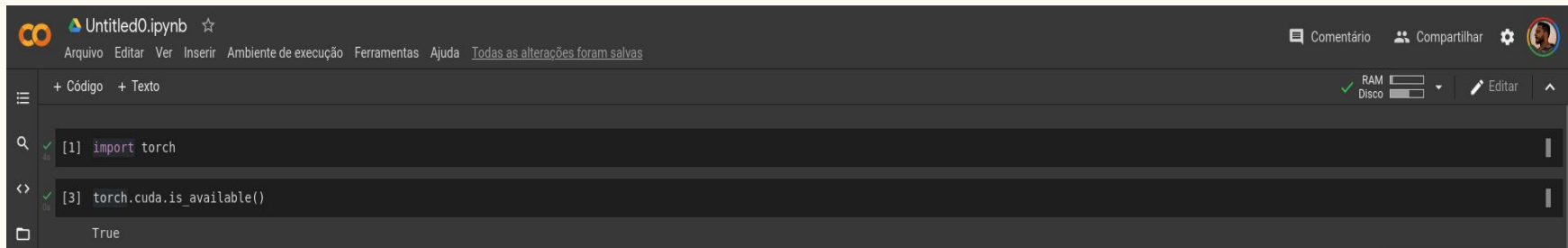


Habilitando a GPU





Testando o funcionamento da GPU

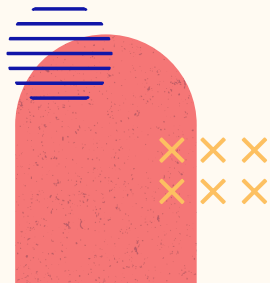


The screenshot shows a Jupyter Notebook titled "Untitled0.ipynb". The interface includes a top bar with a menu (Arquivo, Editar, Ver, Inserir, Ambiente de execução, Ferramentas, Ajuda) and a status bar indicating "Todas as alterações foram salvas". The notebook content consists of two code cells:

```
[1] import torch
```

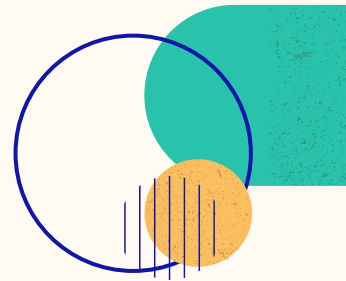
```
[3] torch.cuda.is_available()
```

The output of the second cell is "True". The right sidebar shows a "Comentário" button, a "Compartilhar" button, and a "RAM Disco" indicator with a green checkmark and a progress bar. The bottom of the notebook shows a "True" output.





Obrigado!



Dúvidas?

lucas.rotsen@sga.pucminas.br

fvsilva@sga.pucminas.br

CREDITS: This presentation template was created by [Slidesgo](#), including icons by [Flaticon](#), and infographics & images by [Freepik](#)

Please keep this slide for attribution

