

# Pandas Tutorial

December 9, 2021

## 1 Instalação e setup



- jupyter 1.0.0 - /project/jupyter/
- pandas 1.3.4 - /project/pandas/
- openpyxl 3.0.9 - /project/openpyxl/
- xlwt 1.3.0 - /project/xlwt/
- xlrd 2.0.1 - /project/xlrd/

## 2 Download dos dados



## 3 Introdução

### 3.0.1 Para importar a biblioteca pandas

```
[1]: import pandas as pd
```

### 3.0.2 Para importar a biblioteca numpy

```
[2]: import numpy as np
```

### 3.0.3 Para ler o CSV com as perguntas

```
[3]: questions = pd.read_csv("stack-overflow-developer-survey-2021/  
    ↳survey_results_schema.csv")
```

### 3.0.4 Para visualizar o respetivo DataFrame

```
[4]: questions
```

```
[4]:
```

	qid	qname \
0	QID16	S0
1	QID12	MetaInfo
2	QID1	S1
3	QID2	MainBranch
4	QID24	Employment
5	QID6	Country
6	QID7	US_State
7	QID9	UK_Country
8	QID190	S2
9	QID25	EdLevel
10	QID149	Age1stCode
11	QID276	LearnCode
12	QID32	YearsCode
13	QID34	YearsCodePro
14	QID31	DevType
15	QID29	OrgSize
16	QID50	Currency
17	QID51	CompTotal
18	QID52	CompFreq
19	QID61	S3
20	QID233	Language
21	QID262	Database
22	QID263	Platform
23	QID264	Webframe
24	QID265	MiscTech
25	QID275	ToolsTech
26	QID274	NEWCollabTools
27	QID71	OpSys
28	QID243	NEWStuck
29	QID91	S4
30	QID266	NEWSOSites
31	QID100	SOVisitFreq
32	QID101	SOAccount
33	QID102	SOPartFreq
34	QID106	SOComm
35	QID267	NEWOtherComms
36	QID268	NEWOtherCommsNames
37	QID121	S5
38	QID127	Age
39	QID122	Gender
40	QID153	Trans
41	QID136	Sexuality

42	QID126	Ethnicity
43	QID124	Accessibility
44	QID125	MentalHealth
45	QID131	S6
46	QID132	SurveyLength
47	QID133	SurveyEase

	question	force_resp	type \
0	<div><span style="font-size:19px;"><strong>Hel...	False	DB
1	Browser Meta Info	False	Meta
2	<span style="font-size:22px; font-family: aria...	False	DB
3	Which of the following options best describes ...	True	MC
4	Which of the following best describes your cur...	False	MC
5	Where do you live? <span style="font-weight: b...	True	MC
6	<p>In which state or territory of the USA do y...	False	MC
7	In which part of the United Kingdom do you liv...	False	MC
8	<span style="font-size:22px; font-family: aria...	False	DB
9	Which of the following best describes the high...	False	MC
10	At what age did you write your first line of c...	False	MC
11	How did you learn to code? Select all that apply.	False	MC
12	Including any education, how many years have y...	False	MC
13	NOT including education, how many years have y...	False	MC
14	Which of the following describes your current ...	False	MC
15	Approximately how many people are employed by ...	False	MC
16	Which currency do you use day-to-day? If your ...	True	MC
17	What is your current total compensation (salar...	False	TE
18	Is that compensation weekly, monthly, or yearly?	False	MC
19	<span style="font-size:22px; font-family: aria...	False	DB
20	Which <b>programming, scripting, and markup la...	False	Matrix
21	Which <b>database environments </b>have you do...	False	Matrix
22	Which <b>cloud platforms</b> have you done ext...	False	Matrix
23	Which <strong>web frameworks </strong><span st...	False	Matrix
24	Which <b>other frameworks and libraries</b> ha...	False	Matrix
25	Which <strong>tools</strong> have you done ext...	False	Matrix
26	Which <strong>development environments</strong>...	False	Matrix
27	What is the primary operating system in which ...	False	MC
28	What do you do when you get stuck on a problem...	False	MC
29	<span style="font-size:22px; font-family: aria...	False	DB
30	Which of the following Stack Overflow sites ha...	False	MC
31	How frequently would you say you visit Stack O...	False	MC
32	Do you have a Stack Overflow account?	False	MC
33	How frequently would you say you participate i...	False	MC
34	Do you consider yourself a member of the Stack...	False	MC
35	Are you a member of any other online developer...	False	MC
36	Please name up to 5 other online developer com...	False	Matrix
37	<span style="font-size:22px; font-family: aria...	False	DB
38	What is your age?	False	MC

39	Which of the following describe you, if any? P...	False	MC
40	Do you identify as transgender?	False	MC
41	Which of the following describe you, if any? P...	False	MC
42	Which of the following describe you, if any? P...	False	MC
43	Which of the following describe you, if any? P...	False	MC
44	Which of the following describe you, if any? P...	False	MC
45	<span style="font-size:22px;"><strong>Final Qu...	False	DB
46	How do you feel about the length of the survey...	False	MC
47	How easy or difficult was this survey to compl...	False	MC

```

selector
0      TB
1  Browser
2      TB
3      SAVR
4      MAVR
5      DL
6      DL
7      DL
8      TB
9      SAVR
10     MAVR
11     MAVR
12     DL
13     DL
14     MAVR
15     MAVR
16     SB
17     SL
18     MAVR
19     TB
20  Likert
21  Likert
22  Likert
23  Likert
24  Likert
25  Likert
26  Likert
27     SAVR
28     MAVR
29     TB
30     MAVR
31     MAVR
32     MAVR
33     MAVR
34     MAVR
35     MAVR

```

```

36 Likert
37     TB
38     MAVR
39     MAVR
40     MAVR
41     MAVR
42     MAVR
43     MAVR
44     MAVR
45     TB
46     MAVR
47     MAVR

```

### 3.0.5 Para ler o CSV com as respostas

```
[5]: answers = pd.read_csv("stack-overflow-developer-survey-2021/
    ↪survey_results_public.csv")
```

### 3.0.6 Para visualizar o respetivo DataFrame

```
[6]: answers
```

```
[6]:
```

	ResponseId	MainBranch \
0	1	I am a developer by profession
1	2	I am a student who is learning to code
2	3	I am not primarily a developer, but I write co...
3	4	I am a developer by profession
4	5	I am a developer by profession
...	...	...
83434	83435	I am a developer by profession
83435	83436	I am a developer by profession
83436	83437	I am a developer by profession
83437	83438	I am a developer by profession
83438	83439	I am a developer by profession

	Employment \
0	Independent contractor, freelancer, or self-em...
1	Student, full-time
2	Student, full-time
3	Employed full-time
4	Independent contractor, freelancer, or self-em...
...	...
83434	Employed full-time
83435	Independent contractor, freelancer, or self-em...

83436	Employed full-time
83437	Employed full-time
83438	Employed full-time

	Country	US_State \
0	Slovakia	NaN
1	Netherlands	NaN
2	Russian Federation	NaN
3	Austria	NaN
4	United Kingdom of Great Britain and Northern I...	NaN
...	...	...
83434	United States of America	Texas
83435	Benin	NaN
83436	United States of America	New Jersey
83437	Canada	NaN
83438	Brazil	NaN

	UK_Country	EdLevel \
0	NaN	Secondary school (e.g. American high school, G...
1	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
2	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
3	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
4	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
...	...	...
83434	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83435	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83436	NaN	Secondary school (e.g. American high school, G...
83437	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83438	NaN	Professional degree (JD, MD, etc.)

	Age1stCode	LearnCode \
0	18 - 24 years	Coding Bootcamp;Other online resources (ex: vi...
1	11 - 17 years	Other online resources (ex: videos, blogs, etc...
2	11 - 17 years	Other online resources (ex: videos, blogs, etc...
3	11 - 17 years	NaN
4	5 - 10 years	Friend or family member
...	...	...
83434	11 - 17 years	Other online resources (ex: videos, blogs, etc...
83435	11 - 17 years	Other online resources (ex: videos, blogs, etc...
83436	11 - 17 years	School
83437	11 - 17 years	Online Courses or Certification;Books / Physic...
83438	11 - 17 years	School

	YearsCode	...	Age	Gender	Trans	Sexuality \
0	NaN	...	25-34 years old	Man	No	Straight / Heterosexual
1	7	...	18-24 years old	Man	No	Straight / Heterosexual
2	NaN	...	18-24 years old	Man	No	Prefer not to say

3	NaN	...	35-44 years old	Man	No	Straight / Heterosexual
4	17	...	25-34 years old	Man	No	NaN
...	...	...	...	...	...	...
83434	6	...	25-34 years old	Man	No	Straight / Heterosexual
83435	4	...	18-24 years old	Man	No	Straight / Heterosexual
83436	10	...	25-34 years old	Man	No	NaN
83437	5	...	25-34 years old	Man	No	Straight / Heterosexual
83438	14	...	18-24 years old	Man	No	Straight / Heterosexual

	Ethnicity	Accessibility \
0	White or of European descent	None of the above
1	White or of European descent	None of the above
2	Prefer not to say	None of the above
3	White or of European descent	I am deaf / hard of hearing
4	White or of European descent	None of the above
...	...	...
83434	White or of European descent	None of the above
83435	Black or of African descent	None of the above
83436	White or of European descent	None of the above
83437	White or of European descent	None of the above
83438	Hispanic or Latino/a/x	None of the above

	MentalHealth \
0	None of the above
1	None of the above
2	None of the above
3	NaN
4	NaN
...	...
83434	I have a concentration and/or memory disorder ...
83435	None of the above
83436	None of the above
83437	I have a mood or emotional disorder (e.g. depr...
83438	None of the above

	SurveyLength	SurveyEase	ConvertedCompYearly
0	Appropriate in length	Easy	62268.0
1	Appropriate in length	Easy	NaN
2	Appropriate in length	Easy	NaN
3	Appropriate in length	Neither easy nor difficult	NaN
4	Appropriate in length	Easy	NaN
...	...	...	...
83434	Appropriate in length	Easy	160500.0
83435	Appropriate in length	Easy	3960.0
83436	Appropriate in length	Neither easy nor difficult	90000.0
83437	Appropriate in length	Neither easy nor difficult	816816.0
83438	Appropriate in length	Easy	21168.0

```
[83439 rows x 48 columns]
```

### 3.0.7 Para visualizar o número de linhas e colunas do DataFrame

```
[7]: answers.shape
```

```
[7]: (83439, 48)
```

### 3.0.8 Para visualizar informação detalhada acerca do DataFrame

```
[8]: answers.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 83439 entries, 0 to 83438
Data columns (total 48 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   ResponseId                           83439 non-null  int64
1   MainBranch                           83439 non-null  object
2   Employment                           83323 non-null  object
3   Country                              83439 non-null  object
4   US_State                             14920 non-null  object
5   UK_Country                           4418 non-null   object
6   EdLevel                              83126 non-null  object
7   Age1stCode                           83243 non-null  object
8   LearnCode                            82963 non-null  object
9   YearsCode                            81641 non-null  object
10  YearsCodePro                          61216 non-null  object
11  DevType                              66484 non-null  object
12  OrgSize                              60726 non-null  object
13  Currency                             61080 non-null  object
14  CompTotal                            47183 non-null  float64
15  CompFreq                             52150 non-null  object
16  LanguageHaveWorkedWith               82357 non-null  object
17  LanguageWantToWorkWith               76821 non-null  object
18  DatabaseHaveWorkedWith               69546 non-null  object
19  DatabaseWantToWorkWith               58299 non-null  object
20  PlatformHaveWorkedWith               52135 non-null  object
21  PlatformWantToWorkWith               41619 non-null  object
22  WebframeHaveWorkedWith               61707 non-null  object
23  WebframeWantToWorkWith               52095 non-null  object
24  MiscTechHaveWorkedWith               47055 non-null  object
25  MiscTechWantToWorkWith               38021 non-null  object
26  ToolsTechHaveWorkedWith              72537 non-null  object
```



```

27 ToolsTechWantToWorkWith      65480 non-null object
28 NEWCollabToolsHaveWorkedWith 81234 non-null object
29 NEWCollabToolsWantToWorkWith 73022 non-null object
30 OpSys                        83294 non-null object
31 NEWStuck                     83052 non-null object
32 NEWSOSites                   83171 non-null object
33 SOVisitFreq                  82413 non-null object
34 SOAccount                    82525 non-null object
35 SOPartFreq                   67553 non-null object
36 SOComm                       82319 non-null object
37 NEWOtherComms                82828 non-null object
38 Age                          82407 non-null object
39 Gender                       82286 non-null object
40 Trans                        80678 non-null object
41 Sexuality                    73366 non-null object
42 Ethnicity                    79464 non-null object
43 Accessibility                 77603 non-null object
44 MentalHealth                 76920 non-null object
45 SurveyLength                 81711 non-null object
46 SurveyEase                   81948 non-null object
47 ConvertedCompYearly          46844 non-null float64
dtypes: float64(2), int64(1), object(45)
memory usage: 30.6+ MB

```

### 3.0.9 Para visualizar o número máximo de colunas do DataFrame

```
[9]: pd.set_option("display.max_columns", 48)
```

```
[10]: answers
```

```

[10]:      ResponseId      MainBranch \
0          1      I am a developer by profession
1          2      I am a student who is learning to code
2          3  I am not primarily a developer, but I write co...
3          4      I am a developer by profession
4          5      I am a developer by profession
...      ...      ...
83434     83435      I am a developer by profession
83435     83436      I am a developer by profession
83436     83437      I am a developer by profession
83437     83438      I am a developer by profession
83438     83439      I am a developer by profession

      Employment \
0  Independent contractor, freelancer, or self-em...
1      Student, full-time

```

2	Student, full-time
3	Employed full-time
4	Independent contractor, freelancer, or self-em...
...	...
83434	Employed full-time
83435	Independent contractor, freelancer, or self-em...
83436	Employed full-time
83437	Employed full-time
83438	Employed full-time

	Country	US_State \
0	Slovakia	NaN
1	Netherlands	NaN
2	Russian Federation	NaN
3	Austria	NaN
4	United Kingdom of Great Britain and Northern I...	NaN
...	...	...
83434	United States of America	Texas
83435	Benin	NaN
83436	United States of America	New Jersey
83437	Canada	NaN
83438	Brazil	NaN

	UK_Country	EdLevel \
0	NaN	Secondary school (e.g. American high school, G...
1	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
2	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
3	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
4	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
...	...	...
83434	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83435	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83436	NaN	Secondary school (e.g. American high school, G...
83437	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83438	NaN	Professional degree (JD, MD, etc.)

	Age1stCode	LearnCode \
0	18 - 24 years	Coding Bootcamp;Other online resources (ex: vi...
1	11 - 17 years	Other online resources (ex: videos, blogs, etc...
2	11 - 17 years	Other online resources (ex: videos, blogs, etc...
3	11 - 17 years	NaN
4	5 - 10 years	Friend or family member
...	...	...
83434	11 - 17 years	Other online resources (ex: videos, blogs, etc...
83435	11 - 17 years	Other online resources (ex: videos, blogs, etc...
83436	11 - 17 years	School
83437	11 - 17 years	Online Courses or Certification;Books / Physic...

83438 11 - 17 years

School

	YearsCode	YearsCodePro	\
0	NaN	NaN	
1	7	NaN	
2	NaN	NaN	
3	NaN	NaN	
4	17	10	
...	...	...	
83434	6	5	
83435	4	2	
83436	10	4	
83437	5	3	
83438	14	4	

	DevType	\
0	Developer, mobile	
1	NaN	
2	NaN	
3	Developer, front-end	
4	Developer, desktop or enterprise applications;...	
...	...	
83434	Developer, back-end	
83435	Developer, full-stack	
83436	Data scientist or machine learning specialist;...	
83437	Developer, back-end	
83438	Developer, front-end;Developer, full-stack;Dev...	

	OrgSize	\
0	20 to 99 employees	
1	NaN	
2	NaN	
3	100 to 499 employees	
4	Just me - I am a freelancer, sole proprietor, ...	
...	...	
83434	20 to 99 employees	
83435	Just me - I am a freelancer, sole proprietor, ...	
83436	10,000 or more employees	
83437	20 to 99 employees	
83438	I don't know	

	Currency	CompTotal	CompFreq	\
0	EUR European Euro	4800.0	Monthly	
1	NaN	NaN	NaN	
2	NaN	NaN	NaN	
3	EUR European Euro	NaN	Monthly	
4	GBP\tpound sterling	NaN	NaN	

...	...	...	...
83434	USD\tUnited States dollar	160500.0	Yearly
83435	XOF\tWest African CFA franc	200000.0	Monthly
83436	USD\tUnited States dollar	1800.0	Weekly
83437	CAD\tCanadian dollar	90000.0	Monthly
83438	BRL\tBrazilian real	7700.0	Monthly

	LanguageHaveWorkedWith \
0	C++;HTML/CSS;JavaScript;Objective-C;PHP;Swift
1	JavaScript;Python
2	Assembly;C;Python;R;Rust
3	JavaScript;TypeScript
4	Bash/Shell;HTML/CSS;Python;SQL
...	...
83434	Clojure;Kotlin;SQL
83435	NaN
83436	Groovy;Java;Python
83437	Bash/Shell;JavaScript;Node.js;Python
83438	Delphi;Elixir;HTML/CSS;Java;JavaScript

	LanguageWantToWorkWith \
0	Swift
1	NaN
2	Julia;Python;Rust
3	JavaScript;TypeScript
4	Bash/Shell;HTML/CSS;Python;SQL
...	...
83434	Clojure
83435	NaN
83436	Java;Python
83437	Go;Rust
83438	Elixir;HTML/CSS;Java;JavaScript;Node.js;PHP;SQ...

	DatabaseHaveWorkedWith \
0	PostgreSQL;SQLite
1	PostgreSQL
2	SQLite
3	NaN
4	Elasticsearch;PostgreSQL;Redis
...	...
83434	Oracle;SQLite
83435	Firebase;MariaDB;MySQL;PostgreSQL;Redis;SQLite
83436	DynamoDB;Elasticsearch;MongoDB;PostgreSQL;Redis
83437	Cassandra;Elasticsearch;MongoDB;PostgreSQL;Redis
83438	Oracle;PostgreSQL

	DatabaseWantToWorkWith \
--	--------------------------

0		SQLite
1		NaN
2		SQLite
3		NaN
4	Cassandra;Elasticsearch;PostgreSQL;Redis	
...		...
83434		SQLite
83435	Firebase;MariaDB;MongoDB;MySQL;PostgreSQL;Redi...	
83436		DynamoDB;Redis
83437		NaN
83438	Elasticsearch;MongoDB;MySQL;Oracle;PostgreSQL;...	

	PlatformHaveWorkedWith	PlatformWantToWorkWith	\
0	NaN	NaN	
1	NaN	NaN	
2	Heroku	NaN	
3	NaN	NaN	
4	NaN	NaN	
...	...	...	
83434	AWS	AWS	
83435	NaN	NaN	
83436	AWS;Google Cloud Platform	AWS	
83437	Heroku	AWS;DigitalOcean	
83438	Microsoft Azure	AWS	

	WebframeHaveWorkedWith	\
0	Laravel;Symfony	
1	Angular;Flask;Vue.js	
2	Flask	
3	Angular;jQuery	
4	Flask	
...	...	
83434	NaN	
83435	Django;jQuery;Laravel;React.js;Ruby on Rails	
83436	FastAPI;Flask	
83437	Django;Express;Flask;React.js	
83438	Angular;Spring	

	WebframeWantToWorkWith	\
0	NaN	
1	NaN	
2	Flask	
3	Angular;jQuery	
4	Flask	
...	...	
83434	NaN	
83435	Django;Express;jQuery;Laravel;React.js;Ruby on...	

83436	FastAPI;Flask
83437	NaN
83438	Express;Laravel;Spring;Symfony

	MiscTechHaveWorkedWith \
0	NaN
1	Cordova
2	NumPy;Pandas;TensorFlow;Torch/PyTorch
3	NaN
4	Apache Spark;Hadoop;NumPy;Pandas
...	...
83434	NaN
83435	Flutter;Qt
83436	Hadoop;Keras;NumPy;Pandas
83437	NumPy;Pandas;TensorFlow;Torch/PyTorch
83438	NaN

	MiscTechWantToWorkWith \
0	NaN
1	NaN
2	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch
3	NaN
4	Hadoop;NumPy;Pandas
...	...
83434	NaN
83435	NaN
83436	Apache Spark;Hadoop;Keras;NumPy;Pandas;TensorFlow
83437	NumPy;Pandas;TensorFlow;Torch/PyTorch
83438	NaN

	ToolsTechHaveWorkedWith	ToolsTechWantToWorkWith \
0	NaN	NaN
1	Docker;Git;Yarn	Git
2	NaN	NaN
3	NaN	NaN
4	Docker;Git;Kubernetes;Yarn	Docker;Git;Kubernetes;Yarn
...	...	...
83434	Docker;Git	Git;Kubernetes
83435	Git;Unity 3D;Unreal Engine	Docker;Git;Kubernetes
83436	Ansible;Docker;Git;Terraform	Docker;Git;Kubernetes;Terraform
83437	Ansible;Docker;Git;Terraform	Kubernetes;Terraform
83438	Docker;Git	Docker;Git;Kubernetes

	NEWCollabToolsHaveWorkedWith \
0	PHPStorm;Xcode
1	Android Studio;IntelliJ;Notepad++;PyCharm
2	IPython/Jupyter;PyCharm;RStudio;Sublime Text;V...

```

3                                     NaN
4             Atom;IPython/Jupyter;Notepad++;PyCharm;Vim
...
83434         IntelliJ;Sublime Text;Vim;Visual Studio Code
83435     Android Studio;Eclipse;Emacs;IntelliJ;NetBeans...
83436     Android Studio;Eclipse;IntelliJ;IPython/Jupyte...
83437                     PyCharm;Sublime Text
83438                     IntelliJ;Visual Studio Code

NEWCollabToolsWantToWorkWith      OpSys  \
0             Atom;Xcode            MacOS
1                                     NaN    Windows
2     IPython/Jupyter;RStudio;Sublime Text;Visual St...    MacOS
3                                     NaN    Windows
4     Atom;IPython/Jupyter;Notepad++;PyCharm;Vim;Vis...    Linux-based
...
83434                     Sublime Text;Vim            MacOS
83435     Emacs;IntelliJ;PHPStorm;PyCharm;RStudio;Sublim...    Linux-based
83436                     IntelliJ;IPython/Jupyter;Notepad++;Vim    Windows
83437                                     NaN            MacOS
83438                     IntelliJ;PHPStorm;Visual Studio Code    Linux-based

NEWStuck  \
0     Call a coworker or friend;Visit Stack Overflow...
1             Visit Stack Overflow;Google it
2     Visit Stack Overflow;Google it;Watch help / tu...
3     Call a coworker or friend;Visit Stack Overflow...
4     Visit Stack Overflow;Go for a walk or other ph...
...
83434         Call a coworker or friend;Google it
83435     Call a coworker or friend;Visit Stack Overflow...
83436     Call a coworker or friend;Visit Stack Overflow...
83437     Call a coworker or friend;Visit Stack Overflow...
83438     Call a coworker or friend;Visit Stack Overflow...

NEWSOSites  \
0             Stack Overflow
1             Stack Overflow
2             Stack Overflow;Stack Exchange
3             Stack Overflow
4             Stack Overflow;Stack Exchange
...
83434         Stack Overflow;Stack Exchange
83435         Stack Overflow;Stack Exchange
83436         Stack Overflow;Stack Exchange
83437             Stack Overflow
83438     Stack Overflow;Stack Exchange;Stack Overflow f...

```

	SOVisitFreq	SOAccount \
0	Multiple times per day	Yes
1	Daily or almost daily	Yes
2	Multiple times per day	Yes
3	Daily or almost daily	Yes
4	Daily or almost daily	Yes
...	...	...
83434	A few times per week	No
83435	Multiple times per day	Yes
83436	A few times per week	Yes
83437	A few times per month or weekly	Yes
83438	A few times per week	Yes

	SOPartFreq	SOComm \
0	A few times per month or weekly	Yes, definitely
1	Daily or almost daily	Yes, definitely
2	Multiple times per day	Yes, definitely
3	Daily or almost daily	Neutral
4	A few times per week	Yes, somewhat
...	...	...
83434	NaN	No, not at all
83435	I have never participated in Q&A on Stack Over...	Yes, somewhat
83436	I have never participated in Q&A on Stack Over...	No, not really
83437	Less than once per month or monthly	No, not really
83438	A few times per week	Yes, somewhat

	NEWOtherComms	Age	Gender	Trans	Sexuality \
0	No	25-34 years old	Man	No	Straight / Heterosexual
1	No	18-24 years old	Man	No	Straight / Heterosexual
2	Yes	18-24 years old	Man	No	Prefer not to say
3	No	35-44 years old	Man	No	Straight / Heterosexual
4	No	25-34 years old	Man	No	NaN
...	...	...	...	...	...
83434	No	25-34 years old	Man	No	Straight / Heterosexual
83435	No	18-24 years old	Man	No	Straight / Heterosexual
83436	No	25-34 years old	Man	No	NaN
83437	No	25-34 years old	Man	No	Straight / Heterosexual
83438	No	18-24 years old	Man	No	Straight / Heterosexual

	Ethnicity	Accessibility \
0	White or of European descent	None of the above
1	White or of European descent	None of the above
2	Prefer not to say	None of the above
3	White or of European descent	I am deaf / hard of hearing
4	White or of European descent	None of the above
...	...	...



83434	White or of European descent	None of the above
83435	Black or of African descent	None of the above
83436	White or of European descent	None of the above
83437	White or of European descent	None of the above
83438	Hispanic or Latino/a/x	None of the above

	MentalHealth \
0	None of the above
1	None of the above
2	None of the above
3	NaN
4	NaN
...	...
83434	I have a concentration and/or memory disorder ...
83435	None of the above
83436	None of the above
83437	I have a mood or emotional disorder (e.g. depr...
83438	None of the above

	SurveyLength	SurveyEase	ConvertedCompYearly
0	Appropriate in length	Easy	62268.0
1	Appropriate in length	Easy	NaN
2	Appropriate in length	Easy	NaN
3	Appropriate in length	Neither easy nor difficult	NaN
4	Appropriate in length	Easy	NaN
...	...	...	...
83434	Appropriate in length	Easy	160500.0
83435	Appropriate in length	Easy	3960.0
83436	Appropriate in length	Neither easy nor difficult	90000.0
83437	Appropriate in length	Neither easy nor difficult	816816.0
83438	Appropriate in length	Easy	21168.0

[83439 rows x 48 columns]

### 3.0.10 Para visualizar as 5 primeiras linhas do DataFrame

```
[11]: answers.head()
```

```
[11]:   ResponseId      MainBranch \
0         1  I am a developer by profession
1         2  I am a student who is learning to code
2         3  I am not primarily a developer, but I write co...
3         4  I am a developer by profession
4         5  I am a developer by profession
```

Employment \

0	Independent contractor, freelancer, or self-em...			
1	Student, full-time			
2	Student, full-time			
3	Employed full-time			
4	Independent contractor, freelancer, or self-em...			

  

	Country	US_State	UK_Country	\
0	Slovakia	NaN	NaN	
1	Netherlands	NaN	NaN	
2	Russian Federation	NaN	NaN	
3	Austria	NaN	NaN	
4	United Kingdom of Great Britain and Northern I...	NaN	England	

  

	EdLevel	Age1stCode	\
0	Secondary school (e.g. American high school, G...	18 - 24 years	
1	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	
2	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	
3	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years	
4	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	5 - 10 years	

  

	LearnCode	YearsCode	YearsCodePro	\
0	Coding Bootcamp;Other online resources (ex: vi...	NaN	NaN	
1	Other online resources (ex: videos, blogs, etc...	7	NaN	
2	Other online resources (ex: videos, blogs, etc...	NaN	NaN	
3		NaN	NaN	
4	Friend or family member	17	10	

  

	DevType	\
0	Developer, mobile	
1	NaN	
2	NaN	
3	Developer, front-end	
4	Developer, desktop or enterprise applications;...	

  

	OrgSize	Currency	\
0	20 to 99 employees	EUR European Euro	
1	NaN	NaN	
2	NaN	NaN	
3	100 to 499 employees	EUR European Euro	
4	Just me - I am a freelancer, sole proprietor, ...	GBP\tpound sterling	

  

	CompTotal	CompFreq	LanguageHaveWorkedWith	\
0	4800.0	Monthly	C++;HTML/CSS;JavaScript;Objective-C;PHP;Swift	
1	NaN	NaN	JavaScript;Python	
2	NaN	NaN	Assembly;C;Python;R;Rust	
3	NaN	Monthly	JavaScript;TypeScript	
4	NaN	NaN	Bash/Shell;HTML/CSS;Python;SQL	

	LanguageWantToWorkWith	DatabaseHaveWorkedWith	\
0	Swift	PostgreSQL;SQLite	
1	NaN	PostgreSQL	
2	Julia;Python;Rust	SQLite	
3	JavaScript;TypeScript	NaN	
4	Bash/Shell;HTML/CSS;Python;SQL	Elasticsearch;PostgreSQL;Redis	

  

	DatabaseWantToWorkWith	PlatformHaveWorkedWith	\
0	SQLite	NaN	
1	NaN	NaN	
2	SQLite	Heroku	
3	NaN	NaN	
4	Cassandra;Elasticsearch;PostgreSQL;Redis	NaN	

  

	PlatformWantToWorkWith	WebframeHaveWorkedWith	WebframeWantToWorkWith	\
0	NaN	Laravel;Symfony	NaN	
1	NaN	Angular;Flask;Vue.js	NaN	
2	NaN	Flask	Flask	
3	NaN	Angular;jQuery	Angular;jQuery	
4	NaN	Flask	Flask	

  

	MiscTechHaveWorkedWith	\
0	NaN	
1	Cordova	
2	NumPy;Pandas;TensorFlow;Torch/PyTorch	
3	NaN	
4	Apache Spark;Hadoop;NumPy;Pandas	

  

	MiscTechWantToWorkWith	ToolsTechHaveWorkedWith	\
0	NaN	NaN	
1	NaN	Docker;Git;Yarn	
2	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch	NaN	
3	NaN	NaN	
4	Hadoop;NumPy;Pandas	Docker;Git;Kubernetes;Yarn	

  

	ToolsTechWantToWorkWith	\
0	NaN	
1	Git	
2	NaN	
3	NaN	
4	Docker;Git;Kubernetes;Yarn	

  

	NEWCollabToolsHaveWorkedWith	\
0	PHPStorm;Xcode	
1	Android Studio;IntelliJ;Notepad++;PyCharm	
2	IPython/Jupyter;PyCharm;RStudio;Sublime Text;V...	

3					NaN
4	Atom;IPython/Jupyter;Notepad++;PyCharm;Vim				

  

		NEWCollabToolsWantToWorkWith		OpSys	\
0		Atom;Xcode		MacOS	
1		NaN		Windows	
2	IPython/Jupyter;RStudio;Sublime Text;Visual St...			MacOS	
3		NaN		Windows	
4	Atom;IPython/Jupyter;Notepad++;PyCharm;Vim;Vis...			Linux-based	

  

		NEWStuck	\
0	Call a coworker or friend;Visit Stack Overflow...		
1	Visit Stack Overflow;Google it		
2	Visit Stack Overflow;Google it;Watch help / tu...		
3	Call a coworker or friend;Visit Stack Overflow...		
4	Visit Stack Overflow;Go for a walk or other ph...		

  

	NEWSOSites	SOVisitFreq	SOAccount	\
0	Stack Overflow	Multiple times per day	Yes	
1	Stack Overflow	Daily or almost daily	Yes	
2	Stack Overflow;Stack Exchange	Multiple times per day	Yes	
3	Stack Overflow	Daily or almost daily	Yes	
4	Stack Overflow;Stack Exchange	Daily or almost daily	Yes	

  

	SOPartFreq	SOComm	NEWOtherComms	\
0	A few times per month or weekly	Yes, definitely	No	
1	Daily or almost daily	Yes, definitely	No	
2	Multiple times per day	Yes, definitely	Yes	
3	Daily or almost daily	Neutral	No	
4	A few times per week	Yes, somewhat	No	

  

	Age	Gender	Trans	Sexuality	\
0	25-34 years old	Man	No	Straight / Heterosexual	
1	18-24 years old	Man	No	Straight / Heterosexual	
2	18-24 years old	Man	No	Prefer not to say	
3	35-44 years old	Man	No	Straight / Heterosexual	
4	25-34 years old	Man	No	NaN	

  

	Ethnicity	Accessibility	\
0	White or of European descent	None of the above	
1	White or of European descent	None of the above	
2	Prefer not to say	None of the above	
3	White or of European descent	I am deaf / hard of hearing	
4	White or of European descent	None of the above	

  

	MentalHealth	SurveyLength	SurveyEase	\
0	None of the above	Appropriate in length	Easy	

1	None of the above	Appropriate in length	Easy
2	None of the above	Appropriate in length	Easy
3	NaN	Appropriate in length	Neither easy nor difficult
4	NaN	Appropriate in length	Easy

	ConvertedCompYearly
0	62268.0
1	NaN
2	NaN
3	NaN
4	NaN

### 3.0.11 Para visualizar as 10 primeiras linhas do DataFrame

```
[12]: answers.head(10)
```

```
[12]:
```

	ResponseId	MainBranch \
0	1	I am a developer by profession
1	2	I am a student who is learning to code
2	3	I am not primarily a developer, but I write co...
3	4	I am a developer by profession
4	5	I am a developer by profession
5	6	I am a student who is learning to code
6	7	I code primarily as a hobby
7	8	I am a student who is learning to code
8	9	I am a developer by profession
9	10	I am a developer by profession

	Employment \
0	Independent contractor, freelancer, or self-em...
1	Student, full-time
2	Student, full-time
3	Employed full-time
4	Independent contractor, freelancer, or self-em...
5	Student, part-time
6	I prefer not to say
7	Student, full-time
8	Employed part-time
9	Employed full-time

	Country	US_State \
0	Slovakia	NaN
1	Netherlands	NaN
2	Russian Federation	NaN
3	Austria	NaN
4	United Kingdom of Great Britain and Northern I...	NaN

5		United States of America	Georgia
6		United States of America	New Hampshire
7		Malaysia	NaN
8		India	NaN
9		Sweden	NaN

	UK_Country	EdLevel	\
0	NaN	Secondary school (e.g. American high school, G...	
1	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
2	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
3	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	
4	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	
5	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
6	NaN	Secondary school (e.g. American high school, G...	
7	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
8	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
9	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	

	Age1stCode	LearnCode	YearsCode	\
0	18 - 24 years	Coding Bootcamp;Other online resources (ex: vi...	NaN	
1	11 - 17 years	Other online resources (ex: videos, blogs, etc...	7	
2	11 - 17 years	Other online resources (ex: videos, blogs, etc...	NaN	
3	11 - 17 years		NaN	NaN
4	5 - 10 years	Friend or family member	17	
5	11 - 17 years	Other online resources (ex: videos, blogs, etc...	NaN	
6	11 - 17 years	Other online resources (ex: videos, blogs, etc...	3	
7	11 - 17 years	School;Online Courses or Certification	4	
8	18 - 24 years	Coding Bootcamp	6	
9	11 - 17 years	School	7	

	YearsCodePro	DevType	\
0	NaN	Developer, mobile	
1	NaN	NaN	
2	NaN	NaN	
3	NaN	Developer, front-end	
4	10	Developer, desktop or enterprise applications;...	
5	NaN	NaN	
6	NaN	NaN	
7	NaN	NaN	
8	4	Developer, front-end	
9	4	Data scientist or machine learning specialist	

	OrgSize	Currency	\
0	20 to 99 employees	EUR European Euro	
1	NaN	NaN	
2	NaN	NaN	
3	100 to 499 employees	EUR European Euro	

4	Just me - I am a freelancer, sole proprietor, ...	GBP\t	Pound sterling
5		NaN	NaN
6		NaN	NaN
7		NaN	NaN
8	10,000 or more employees	INR\t	Indian rupee
9	10 to 19 employees	SEK\t	Swedish krona

	CompTotal	CompFreq	LanguageHaveWorkedWith \
0	4800.0	Monthly	C++;HTML/CSS;JavaScript;Objective-C;PHP;Swift
1	NaN	NaN	JavaScript;Python
2	NaN	NaN	Assembly;C;Python;R;Rust
3	NaN	Monthly	JavaScript;TypeScript
4	NaN	NaN	Bash/Shell;HTML/CSS;Python;SQL
5	NaN	NaN	C;C#;C++;HTML/CSS;Java;JavaScript;Node.js;Powe...
6	NaN	NaN	HTML/CSS;JavaScript
7	NaN	NaN	HTML/CSS;JavaScript;PHP;Ruby;SQL;TypeScript
8	NaN	Monthly	HTML/CSS;JavaScript
9	42000.0	Monthly	C++;Python

	LanguageWantToWorkWith \
0	Swift
1	NaN
2	Julia;Python;Rust
3	JavaScript;TypeScript
4	Bash/Shell;HTML/CSS;Python;SQL
5	C#;C++;Go;HTML/CSS;Java;JavaScript;Node.js;Obj...
6	HTML/CSS;JavaScript;PHP
7	Ruby
8	HTML/CSS;JavaScript
9	Haskell;Python

	DatabaseHaveWorkedWith \
0	PostgreSQL;SQLite
1	PostgreSQL
2	SQLite
3	NaN
4	Elasticsearch;PostgreSQL;Redis
5	MySQL;PostgreSQL;SQLite
6	NaN
7	MySQL;PostgreSQL;SQLite
8	PostgreSQL
9	PostgreSQL

	DatabaseWantToWorkWith	PlatformHaveWorkedWith \
0	SQLite	NaN
1	NaN	NaN
2	SQLite	Heroku

3		NaN	NaN
4	Cassandra;Elasticsearch;PostgreSQL;Redis		NaN
5	Elasticsearch;Firebase;IBM DB2;MariaDB;Microso...		NaN
6		NaN	NaN
7		PostgreSQL Heroku;Microsoft Azure	
8		PostgreSQL	AWS
9		NaN	NaN

	PlatformWantToWorkWith	WebframeHaveWorkedWith \
0	NaN	Laravel;Symfony
1	NaN	Angular;Flask;Vue.js
2	NaN	Flask
3	NaN	Angular;jQuery
4	NaN	Flask
5	NaN	Express;Flask;jQuery;React.js
6	NaN	jQuery
7	Heroku	Angular.js;jQuery;Ruby on Rails
8	NaN	Django;FastAPI
9	NaN	NaN

	WebframeWantToWorkWith	MiscTechHaveWorkedWith \
0	NaN	NaN
1	NaN	Cordova
2	Flask	NumPy;Pandas;TensorFlow;Torch/PyTorch
3	Angular;jQuery	NaN
4	Flask	Apache Spark;Hadoop;NumPy;Pandas
5	Express;Flask;jQuery;React.js	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch
6	jQuery	NaN
7	Ruby on Rails	NaN
8	Django;FastAPI	NaN
9	NaN	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch

	MiscTechWantToWorkWith \
0	NaN
1	NaN
2	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch
3	NaN
4	Hadoop;NumPy;Pandas
5	Keras;NumPy;Pandas;Qt;React Native;TensorFlow;...
6	NaN
7	NaN
8	NaN
9	Keras;NumPy;TensorFlow;Torch/PyTorch

	ToolsTechHaveWorkedWith	ToolsTechWantToWorkWith \
0	NaN	NaN
1	Docker;Git;Yarn	Git



2	NaN	NaN
3	NaN	NaN
4	Docker;Git;Kubernetes;Yarn	Docker;Git;Kubernetes;Yarn
5	Git	Docker;Git;Unity 3D;Unreal Engine
6	NaN	NaN
7	NaN	NaN
8	Docker;Git	Docker;Git;Kubernetes
9	Git	Git

	NEWCollabToolsHaveWorkedWith \
0	PHPStorm;Xcode
1	Android Studio;IntelliJ;Notepad++;PyCharm
2	IPython/Jupyter;PyCharm;RStudio;Sublime Text;V...
3	NaN
4	Atom;IPython/Jupyter;Notepad++;PyCharm;Vim
5	IPython/Jupyter;Notepad++;PyCharm;Sublime Text...
6	NaN
7	Sublime Text;Visual Studio Code
8	PyCharm;Sublime Text
9	IPython/Jupyter;Vim;Visual Studio Code

	NEWCollabToolsWantToWorkWith	OpSys \
0	Atom;Xcode	MacOS
1	NaN	Windows
2	IPython/Jupyter;RStudio;Sublime Text;Visual St...	MacOS
3	NaN	Windows
4	Atom;IPython/Jupyter;Notepad++;PyCharm;Vim;Vis...	Linux-based
5	Android Studio;IPython/Jupyter;Vim;Visual Stud...	Windows
6	NaN	Windows
7	Sublime Text;Visual Studio Code	Linux-based
8	PyCharm;Sublime Text	Windows
9	Emacs;IPython/Jupyter;Vim;Visual Studio Code	Linux-based

	NEWStuck \
0	Call a coworker or friend;Visit Stack Overflow...
1	Visit Stack Overflow;Google it
2	Visit Stack Overflow;Google it;Watch help / tu...
3	Call a coworker or friend;Visit Stack Overflow...
4	Visit Stack Overflow;Go for a walk or other ph...
5	Visit Stack Overflow;Go for a walk or other ph...
6	Call a coworker or friend;Visit Stack Overflow...
7	Visit Stack Overflow;Go for a walk or other ph...
8	Visit Stack Overflow;Google it;Panic
9	Call a coworker or friend;Visit Stack Overflow...

	NEWSOSites	SOVisitFreq	SOAccount \
0	Stack Overflow	Multiple times per day	Yes

1	Stack Overflow	Daily or almost daily	Yes
2	Stack Overflow;Stack Exchange	Multiple times per day	Yes
3	Stack Overflow	Daily or almost daily	Yes
4	Stack Overflow;Stack Exchange	Daily or almost daily	Yes
5	Stack Overflow;Stack Exchange	Multiple times per day	Yes
6	Stack Overflow	Daily or almost daily	Yes
7	Stack Overflow;Stack Exchange	Multiple times per day	Yes
8	Stack Overflow;Stack Exchange	A few times per week	Yes
9	Stack Overflow;Stack Exchange	Multiple times per day	Yes

		SOPartFreq	SOCComm \
0	A few times per month or weekly	Yes, definitely	
1	Daily or almost daily	Yes, definitely	
2	Multiple times per day	Yes, definitely	
3	Daily or almost daily	Neutral	
4	A few times per week	Yes, somewhat	
5	I have never participated in Q&A on Stack Over...	Yes, somewhat	
6	A few times per week	Yes, somewhat	
7	I have never participated in Q&A on Stack Over...	No, not at all	
8	Less than once per month or monthly	Yes, definitely	
9	Daily or almost daily	Yes, somewhat	

	NEWOtherComms	Age	Gender	Trans \
0	No	25-34 years old	Man	No
1	No	18-24 years old	Man	No
2	Yes	18-24 years old	Man	No
3	No	35-44 years old	Man	No
4	No	25-34 years old	Man	No
5	No	18-24 years old	Prefer not to say	No
6	No	Prefer not to say	Prefer not to say	No
7	Yes	18-24 years old	Woman	No
8	No	25-34 years old	Man	No
9	No	25-34 years old	Man	No

	Sexuality	Ethnicity \
0	Straight / Heterosexual	White or of European descent
1	Straight / Heterosexual	White or of European descent
2	Prefer not to say	Prefer not to say
3	Straight / Heterosexual	White or of European descent
4	NaN	White or of European descent
5	Straight / Heterosexual	Prefer not to say
6	NaN	I don't know
7	Straight / Heterosexual	White or of European descent;Multiracial;South...
8	NaN	South Asian
9	Straight / Heterosexual	White or of European descent

Accessibility \

```

0      None of the above
1      None of the above
2      None of the above
3 I am deaf / hard of hearing
4      None of the above
5      None of the above
6      None of the above
7      None of the above
8      NaN
9      None of the above

```

```

                                MentalHealth      SurveyLength \
0      None of the above      Appropriate in length
1      None of the above      Appropriate in length
2      None of the above      Appropriate in length
3      NaN      Appropriate in length
4      NaN      Appropriate in length
5 I have a concentration and/or memory disorder ...      Too long
6      None of the above      Appropriate in length
7      None of the above      Appropriate in length
8 I have a concentration and/or memory disorder ...      Appropriate in length
9      None of the above      Appropriate in length

```

```

                SurveyEase      ConvertedCompYearly
0      Easy      62268.0
1      Easy      NaN
2      Easy      NaN
3 Neither easy nor difficult      NaN
4      Easy      NaN
5 Neither easy nor difficult      NaN
6 Neither easy nor difficult      NaN
7      Easy      NaN
8      Easy      NaN
9 Neither easy nor difficult      51552.0

```

### 3.0.12 Para visualizar as 5 últimas linhas do DataFrame

```
[13]: answers.tail()
```

```

[13]:      ResponseId      MainBranch \
83434      83435 I am a developer by profession
83435      83436 I am a developer by profession
83436      83437 I am a developer by profession
83437      83438 I am a developer by profession
83438      83439 I am a developer by profession

```

	Employment \
83434	Employed full-time
83435	Independent contractor, freelancer, or self-em...
83436	Employed full-time
83437	Employed full-time
83438	Employed full-time

	Country	US_State	UK_Country \
83434	United States of America	Texas	NaN
83435	Benin	NaN	NaN
83436	United States of America	New Jersey	NaN
83437	Canada	NaN	NaN
83438	Brazil	NaN	NaN

	EdLevel	Age1stCode \
83434	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years
83435	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years
83436	Secondary school (e.g. American high school, G...	11 - 17 years
83437	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years
83438	Professional degree (JD, MD, etc.)	11 - 17 years

	LearnCode	YearsCode \
83434	Other online resources (ex: videos, blogs, etc...	6
83435	Other online resources (ex: videos, blogs, etc...	4
83436	School	10
83437	Online Courses or Certification;Books / Physic...	5
83438	School	14

	YearsCodePro	DevType \
83434	5	Developer, back-end
83435	2	Developer, full-stack
83436	4	Data scientist or machine learning specialist;...
83437	3	Developer, back-end
83438	4	Developer, front-end;Developer, full-stack;Dev...

	OrgSize \
83434	20 to 99 employees
83435	Just me - I am a freelancer, sole proprietor, ...
83436	10,000 or more employees
83437	20 to 99 employees
83438	I don't know

	Currency	CompTotal	CompFreq \
83434	USD\tUnited States dollar	160500.0	Yearly
83435	XOF\tWest African CFA franc	200000.0	Monthly
83436	USD\tUnited States dollar	1800.0	Weekly
83437	CAD\tCanadian dollar	90000.0	Monthly

83438	BRL\tBrazilian real	7700.0	Monthly
	LanguageHaveWorkedWith \		
83434	Clojure;Kotlin;SQL		
83435	NaN		
83436	Groovy;Java;Python		
83437	Bash/Shell;JavaScript;Node.js;Python		
83438	Delphi;Elixir;HTML/CSS;Java;JavaScript		
	LanguageWantToWorkWith \		
83434	Clojure		
83435	NaN		
83436	Java;Python		
83437	Go;Rust		
83438	Elixir;HTML/CSS;Java;JavaScript;Node.js;PHP;SQ...		
	DatabaseHaveWorkedWith \		
83434	Oracle;SQLite		
83435	Firebase;MariaDB;MySQL;PostgreSQL;Redis;SQLite		
83436	DynamoDB;Elasticsearch;MongoDB;PostgreSQL;Redis		
83437	Cassandra;Elasticsearch;MongoDB;PostgreSQL;Redis		
83438	Oracle;PostgreSQL		
	DatabaseWantToWorkWith \		
83434	SQLite		
83435	Firebase;MariaDB;MongoDB;MySQL;PostgreSQL;Redi...		
83436	DynamoDB;Redis		
83437	NaN		
83438	Elasticsearch;MongoDB;MySQL;Oracle;PostgreSQL;...		
	PlatformHaveWorkedWith	PlatformWantToWorkWith	\
83434	AWS	AWS	
83435	NaN	NaN	
83436	AWS;Google Cloud Platform	AWS	
83437	Heroku	AWS;DigitalOcean	
83438	Microsoft Azure	AWS	
	WebframeHaveWorkedWith \		
83434	NaN		
83435	Django;jQuery;Laravel;React.js;Ruby on Rails		
83436	FastAPI;Flask		
83437	Django;Express;Flask;React.js		
83438	Angular;Spring		
	WebframeWantToWorkWith \		
83434	NaN		
83435	Django;Express;jQuery;Laravel;React.js;Ruby on...		

83436		FastAPI;Flask	
83437		NaN	
83438		Express;Laravel;Spring;Symfony	
		MiscTechHaveWorkedWith	\
83434		NaN	
83435		Flutter;Qt	
83436		Hadoop;Keras;NumPy;Pandas	
83437		NumPy;Pandas;TensorFlow;Torch/PyTorch	
83438		NaN	
		MiscTechWantToWorkWith	\
83434		NaN	
83435		NaN	
83436		Apache Spark;Hadoop;Keras;NumPy;Pandas;TensorFlow	
83437		NumPy;Pandas;TensorFlow;Torch/PyTorch	
83438		NaN	
		ToolsTechHaveWorkedWith	ToolsTechWantToWorkWith \
83434		Docker;Git	Git;Kubernetes
83435		Git;Unity 3D;Unreal Engine	Docker;Git;Kubernetes
83436		Ansible;Docker;Git;Terraform	Docker;Git;Kubernetes;Terraform
83437		Ansible;Docker;Git;Terraform	Kubernetes;Terraform
83438		Docker;Git	Docker;Git;Kubernetes
		NEWCollabToolsHaveWorkedWith	\
83434		IntelliJ;Sublime Text;Vim;Visual Studio Code	
83435		Android Studio;Eclipse;Emacs;IntelliJ;NetBeans...	
83436		Android Studio;Eclipse;IntelliJ;IPython/Jupyter...	
83437		PyCharm;Sublime Text	
83438		IntelliJ;Visual Studio Code	
		NEWCollabToolsWantToWorkWith	OpSys \
83434		Sublime Text;Vim	MacOS
83435		Emacs;IntelliJ;PHPStorm;PyCharm;RStudio;Sublim...	Linux-based
83436		IntelliJ;IPython/Jupyter;Notepad++;Vim	Windows
83437		NaN	MacOS
83438		IntelliJ;PHPStorm;Visual Studio Code	Linux-based
		NEWStuck	\
83434		Call a coworker or friend;Google it	
83435		Call a coworker or friend;Visit Stack Overflow...	
83436		Call a coworker or friend;Visit Stack Overflow...	
83437		Call a coworker or friend;Visit Stack Overflow...	
83438		Call a coworker or friend;Visit Stack Overflow...	

NEWSOSites \

83434	Stack Overflow;Stack Exchange
83435	Stack Overflow;Stack Exchange
83436	Stack Overflow;Stack Exchange
83437	Stack Overflow
83438	Stack Overflow;Stack Exchange;Stack Overflow f...

	SOVisitFreq	SOAccount	\
83434	A few times per week	No	
83435	Multiple times per day	Yes	
83436	A few times per week	Yes	
83437	A few times per month or weekly	Yes	
83438	A few times per week	Yes	

	SOPartFreq	SOCComm	\
83434	NaN	No, not at all	
83435	I have never participated in Q&A on Stack Over...	Yes, somewhat	
83436	I have never participated in Q&A on Stack Over...	No, not really	
83437	Less than once per month or monthly	No, not really	
83438	A few times per week	Yes, somewhat	

	NEWOtherComms	Age	Gender	Trans	Sexuality	\
83434	No	25-34 years old	Man	No	Straight / Heterosexual	
83435	No	18-24 years old	Man	No	Straight / Heterosexual	
83436	No	25-34 years old	Man	No	NaN	
83437	No	25-34 years old	Man	No	Straight / Heterosexual	
83438	No	18-24 years old	Man	No	Straight / Heterosexual	

	Ethnicity	Accessibility	\
83434	White or of European descent	None of the above	
83435	Black or of African descent	None of the above	
83436	White or of European descent	None of the above	
83437	White or of European descent	None of the above	
83438	Hispanic or Latino/a/x	None of the above	

	MentalHealth	\
83434	I have a concentration and/or memory disorder ...	
83435	None of the above	
83436	None of the above	
83437	I have a mood or emotional disorder (e.g. depr...	
83438	None of the above	

	SurveyLength	SurveyEase	ConvertedCompYearly
83434	Appropriate in length	Easy	160500.0
83435	Appropriate in length	Easy	3960.0
83436	Appropriate in length	Neither easy nor difficult	90000.0
83437	Appropriate in length	Neither easy nor difficult	816816.0
83438	Appropriate in length	Easy	21168.0

### 3.0.13 Para visualizar as 10 últimas linhas do DataFrame

```
[14]: answers.tail(10)
```

```
[14]:      ResponseId      MainBranch \
83429      83430      I code primarily as a hobby
83430      83431      I am a developer by profession
83431      83432      I am a developer by profession
83432      83433      I am a developer by profession
83433      83434      I am a developer by profession
83434      83435      I am a developer by profession
83435      83436      I am a developer by profession
83436      83437      I am a developer by profession
83437      83438      I am a developer by profession
83438      83439      I am a developer by profession
```

```
      Employment \
83429      Not employed, but looking for work
83430      Employed full-time
83431      Independent contractor, freelancer, or self-em...
83432      Employed full-time
83433      Independent contractor, freelancer, or self-em...
83434      Employed full-time
83435      Independent contractor, freelancer, or self-em...
83436      Employed full-time
83437      Employed full-time
83438      Employed full-time
```

```
      Country      US_State      UK_Country \
83429      United States of America      Washington      NaN
83430      United States of America      Illinois      NaN
83431      Pakistan      NaN      NaN
83432      Canada      NaN      NaN
83433      Brazil      NaN      NaN
83434      United States of America      Texas      NaN
83435      Benin      NaN      NaN
83436      United States of America      New Jersey      NaN
83437      Canada      NaN      NaN
83438      Brazil      NaN      NaN
```

```
      EdLevel      Age1stCode \
83429      Bachelor's degree (B.A., B.S., B.Eng., etc.)      18 - 24 years
83430      Master's degree (M.A., M.S., M.Eng., MBA, etc.)      11 - 17 years
83431      Bachelor's degree (B.A., B.S., B.Eng., etc.)      11 - 17 years
83432      Bachelor's degree (B.A., B.S., B.Eng., etc.)      18 - 24 years
83433      Bachelor's degree (B.A., B.S., B.Eng., etc.)      18 - 24 years
83434      Bachelor's degree (B.A., B.S., B.Eng., etc.)      11 - 17 years
```



83435	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years
83436	Secondary school (e.g. American high school, G...	11 - 17 years
83437	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years
83438	Professional degree (JD, MD, etc.)	11 - 17 years

	LearnCode	YearsCode	\
83429	Other online resources (ex: videos, blogs, etc)	6	
83430	Other online resources (ex: videos, blogs, etc...	23	
83431	Other online resources (ex: videos, blogs, etc...	9	
83432	School	5	
83433	Online Forum;Online Courses or Certification;O...	15	
83434	Other online resources (ex: videos, blogs, etc...	6	
83435	Other online resources (ex: videos, blogs, etc...	4	
83436	School	10	
83437	Online Courses or Certification;Books / Physic...	5	
83438	School	14	

	YearsCodePro	DevType	\
83429	NaN	Other (please specify)::Student	
83430	21	Developer, front-end;Developer, full-stack;Dev...	
83431	4	Developer, mobile;Developer, desktop or enterp...	
83432	Less than 1 year	Developer, back-end	
83433	11	Developer, mobile;Developer, front-end;Develop...	
83434	5	Developer, back-end	
83435	2	Developer, full-stack	
83436	4	Data scientist or machine learning specialist;...	
83437	3	Developer, back-end	
83438	4	Developer, front-end;Developer, full-stack;Dev...	

	OrgSize	\
83429	NaN	
83430	10 to 19 employees	
83431	2 to 9 employees	
83432	10,000 or more employees	
83433	1,000 to 4,999 employees	
83434	20 to 99 employees	
83435	Just me - I am a freelancer, sole proprietor, ...	
83436	10,000 or more employees	
83437	20 to 99 employees	
83438	I don't know	

	Currency	CompTotal	CompFreq	\
83429	NaN	NaN	NaN	
83430	USD\tUnited States dollar	125000.0	Yearly	
83431	PKR\tPakistani rupee	150000.0	Monthly	
83432	CAD\tCanadian dollar	106000.0	Yearly	
83433	BRL\tBrazilian real	80000.0	Yearly	

83434	USD\tUnited States dollar	160500.0	Yearly
83435	XOF\tWest African CFA franc	200000.0	Monthly
83436	USD\tUnited States dollar	1800.0	Weekly
83437	CAD\tCanadian dollar	90000.0	Monthly
83438	BRL\tBrazilian real	7700.0	Monthly

	LanguageHaveWorkedWith	\
83429	HTML/CSS;PHP;PowerShell;Python;SQL;VBA	
83430	APL;Clojure;LISP;Python;Ruby;SQL;TypeScript	
83431	C#;Dart;HTML/CSS;Java;JavaScript;Kotlin;Node.js...	
83432	Ruby	
83433	Java;JavaScript;Kotlin;Objective-C;TypeScript	
83434	Clojure;Kotlin;SQL	
83435	NaN	
83436	Groovy;Java;Python	
83437	Bash/Shell;JavaScript;Node.js;Python	
83438	Delphi;Elixir;HTML/CSS;Java;JavaScript	

	LanguageWantToWorkWith	\
83429	C#;Go;HTML/CSS;Java;JavaScript;PHP;Python;SQL;VBA	
83430	APL;Clojure;Haskell;LISP;R	
83431	C#;Dart;HTML/CSS;JavaScript;Kotlin;Node.js;Pyt...	
83432	Java;Ruby;TypeScript	
83433	Kotlin	
83434	Clojure	
83435	NaN	
83436	Java;Python	
83437	Go;Rust	
83438	Elixir;HTML/CSS;Java;JavaScript;Node.js;PHP;SQ...	

	DatabaseHaveWorkedWith	\
83429	MongoDB;MySQL;PostgreSQL	
83430	MongoDB;MySQL;PostgreSQL;Redis	
83431	Firebase;MySQL;SQLite	
83432	MySQL;PostgreSQL	
83433	Firebase;MongoDB;MySQL;SQLite	
83434	Oracle;SQLite	
83435	Firebase;MariaDB;MySQL;PostgreSQL;Redis;SQLite	
83436	DynamoDB;Elasticsearch;MongoDB;PostgreSQL;Redis	
83437	Cassandra;Elasticsearch;MongoDB;PostgreSQL;Redis	
83438	Oracle;PostgreSQL	

	DatabaseWantToWorkWith	\
83429	MariaDB;Microsoft SQL Server;MongoDB;MySQL;Pos...	
83430	PostgreSQL	
83431	DynamoDB;Firebase;MongoDB;MySQL;SQLite	
83432	NaN	

83433		NaN
83434		SQLite
83435	Firestore;MariaDB;MongoDB;MySQL;PostgreSQL;Redi...	
83436		DynamoDB;Redis
83437		NaN
83438	Elasticsearch;MongoDB;MySQL;Oracle;PostgreSQL;...	
	PlatformHaveWorkedWith \	
83429		Heroku
83430	AWS;DigitalOcean;Google Cloud Platform;Heroku	
83431		Google Cloud Platform
83432		Google Cloud Platform;Heroku
83433		NaN
83434		AWS
83435		NaN
83436		AWS;Google Cloud Platform
83437		Heroku
83438		Microsoft Azure
	PlatformWantToWorkWith \	
83429	AWS;Heroku;IBM Cloud or Watson;Microsoft Azure...	
83430		AWS;DigitalOcean;Google Cloud Platform
83431		AWS;Google Cloud Platform
83432		NaN
83433		NaN
83434		AWS
83435		NaN
83436		AWS
83437		AWS;DigitalOcean
83438		AWS
	WebframeHaveWorkedWith \	
83429		Django;Flask;jQuery
83430		Django;React.js;Ruby on Rails
83431		Flask;jQuery
83432		Flask;React.js;Ruby on Rails;Vue.js
83433		React.js
83434		NaN
83435	Django;jQuery;Laravel;React.js;Ruby on Rails	
83436		FastAPI;Flask
83437		Django;Express;Flask;React.js
83438		Angular;Spring
	WebframeWantToWorkWith \	
83429	Angular.js;ASP.NET;ASP.NET Core ;Django;FastAP...	
83430		NaN
83431		Angular;Django;Flask;jQuery;Laravel

83432		NaN
83433		NaN
83434		NaN
83435	Django;Express;jQuery;Laravel;React.js;Ruby on...	
83436		FastAPI;Flask
83437		NaN
83438	Express;Laravel;Spring;Symfony	

	MiscTechHaveWorkedWith \	
83429	NumPy;Pandas	
83430		NaN
83431	Flutter	
83432	NumPy;Pandas;TensorFlow;Torch/PyTorch	
83433	React Native	
83434		NaN
83435	Flutter;Qt	
83436	Hadoop;Keras;NumPy;Pandas	
83437	NumPy;Pandas;TensorFlow;Torch/PyTorch	
83438		NaN

	MiscTechWantToWorkWith \	
83429	.NET Framework;.NET Core / .NET 5;NumPy;Pandas	
83430		NaN
83431	Flutter;Hadoop;NumPy;TensorFlow;Torch/PyTorch	
83432		NaN
83433	Flutter	
83434		NaN
83435		NaN
83436	Apache Spark;Hadoop;Keras;NumPy;Pandas;TensorFlow	
83437	NumPy;Pandas;TensorFlow;Torch/PyTorch	
83438		NaN

	ToolsTechHaveWorkedWith	ToolsTechWantToWorkWith \
83429	Git	Docker;Git;Xamarin
83430	Docker;Git	Docker;Git;Kubernetes;Unity 3D
83431	Git	Docker;Git
83432	Docker;Git;Kubernetes;Yarn	NaN
83433	Docker;Git;Yarn	Docker;Git
83434	Docker;Git	Git;Kubernetes
83435	Git;Unity 3D;Unreal Engine	Docker;Git;Kubernetes
83436	Ansible;Docker;Git;Terraform	Docker;Git;Kubernetes;Terraform
83437	Ansible;Docker;Git;Terraform	Kubernetes;Terraform
83438	Docker;Git	Docker;Git;Kubernetes

	NEWCollabToolsHaveWorkedWith \	
83429	Atom;Notepad++;Sublime Text;Visual Studio Code	
83430		Emacs;Vim

83431 Android Studio;IntelliJ;IPython/Jupyter;Notepa...  
 83432 Atom;IPython/Jupyter;Vim;Visual Studio Code  
 83433 Android Studio;Visual Studio Code;Xcode  
 83434 IntelliJ;Sublime Text;Vim;Visual Studio Code  
 83435 Android Studio;Eclipse;Emacs;IntelliJ;NetBeans...  
 83436 Android Studio;Eclipse;IntelliJ;IPython/Jupyte...  
 83437 PyCharm;Sublime Text  
 83438 IntelliJ;Visual Studio Code

	NEWCollabToolsWantToWorkWith	OpSys \
83429	Atom;Notepad++;Sublime Text;Visual Studio Code	Windows
83430	Emacs	Linux-based
83431	Android Studio;IntelliJ;IPython/Jupyter;PyChar...	Windows
83432	NaN	MacOS
83433	Android Studio;Xcode	MacOS
83434	Sublime Text;Vim	MacOS
83435	Emacs;IntelliJ;PHPStorm;PyCharm;RStudio;Sublim...	Linux-based
83436	IntelliJ;IPython/Jupyter;Notepad++;Vim	Windows
83437	NaN	MacOS
83438	IntelliJ;PHPStorm;Visual Studio Code	Linux-based

	NEWStuck \
83429	Visit Stack Overflow;Google it;Watch help / tu...
83430	Call a coworker or friend;Visit Stack Overflow...
83431	Visit Stack Overflow;Go for a walk or other ph...
83432	Visit Stack Overflow;Go for a walk or other ph...
83433	Call a coworker or friend;Visit Stack Overflow...
83434	Call a coworker or friend;Google it
83435	Call a coworker or friend;Visit Stack Overflow...
83436	Call a coworker or friend;Visit Stack Overflow...
83437	Call a coworker or friend;Visit Stack Overflow...
83438	Call a coworker or friend;Visit Stack Overflow...

	NEWSOSites \
83429	Stack Overflow;Stack Exchange
83430	Stack Overflow;Stack Exchange
83431	Stack Overflow;Stack Exchange
83432	Stack Overflow;Stack Exchange
83433	Stack Overflow
83434	Stack Overflow;Stack Exchange
83435	Stack Overflow;Stack Exchange
83436	Stack Overflow;Stack Exchange
83437	Stack Overflow
83438	Stack Overflow;Stack Exchange;Stack Overflow f...

	SOVisitFreq	SOAccount \
83429	A few times per month or weekly	Not sure/can't remember

83430	A few times per week	No
83431	Multiple times per day	Yes
83432	Daily or almost daily	No
83433	Daily or almost daily	Yes
83434	A few times per week	No
83435	Multiple times per day	Yes
83436	A few times per week	Yes
83437	A few times per month or weekly	Yes
83438	A few times per week	Yes

	SOPartFreq	SOCComm \
83429	NaN	Yes, somewhat
83430	NaN	No, not really
83431	A few times per month or weekly	Yes, definitely
83432	NaN	No, not really
83433	A few times per month or weekly	Yes, somewhat
83434	NaN	No, not at all
83435	I have never participated in Q&A on Stack Over...	Yes, somewhat
83436	I have never participated in Q&A on Stack Over...	No, not really
83437	Less than once per month or monthly	No, not really
83438	A few times per week	Yes, somewhat

	NEWOtherComms	Age	Gender Trans \
83429	No	25-34 years old	Man;Or, in your own words: Yes
83430	No	45-54 years old	Man No
83431	No	18-24 years old	Man No
83432	No	18-24 years old	Woman No
83433	No	25-34 years old	Man No
83434	No	25-34 years old	Man No
83435	No	18-24 years old	Man No
83436	No	25-34 years old	Man No
83437	No	25-34 years old	Man No
83438	No	18-24 years old	Man No

	Sexuality	Ethnicity \
83429	Queer	White or of European descent
83430	Straight / Heterosexual	White or of European descent
83431	Straight / Heterosexual	Southeast Asian
83432	Straight / Heterosexual	East Asian
83433	Straight / Heterosexual	Hispanic or Latino/a/x
83434	Straight / Heterosexual	White or of European descent
83435	Straight / Heterosexual	Black or of African descent
83436	NaN	White or of European descent
83437	Straight / Heterosexual	White or of European descent
83438	Straight / Heterosexual	Hispanic or Latino/a/x

Accessibility \

83429	I am unable to / find it difficult to walk or ...	
83430		None of the above
83431		None of the above
83432		None of the above
83433		None of the above
83434		None of the above
83435		None of the above
83436		None of the above
83437		None of the above
83438		None of the above

		MentalHealth \
83429	I have an anxiety disorder	
83430		None of the above
83431		None of the above
83432		None of the above
83433	I have an anxiety disorder	
83434	I have a concentration and/or memory disorder ...	
83435		None of the above
83436		None of the above
83437	I have a mood or emotional disorder (e.g. depr...	
83438		None of the above

	SurveyLength	SurveyEase	ConvertedCompYearly
83429	Appropriate in length	Neither easy nor difficult	NaN
83430	Appropriate in length	Easy	125000.0
83431	Appropriate in length	Easy	11676.0
83432	Appropriate in length	Easy	80169.0
83433	Appropriate in length	Easy	18326.0
83434	Appropriate in length	Easy	160500.0
83435	Appropriate in length	Easy	3960.0
83436	Appropriate in length	Neither easy nor difficult	90000.0
83437	Appropriate in length	Neither easy nor difficult	816816.0
83438	Appropriate in length	Easy	21168.0

### 3.1 DataFrames e Series

#### 3.1.1 Para criar um DataFrame

```
[15]: students = {
    "name": ["Francisco Gonçalves", "Carlos Costa", "Maria Almeida"],
    "number": [76433, 78944, 74822],
    "course": ["Direito", "Biologia", "Arquitetura"]
}
```

```
[16]: students_df = pd.DataFrame(students)
```

```
[17]: students_df
```

```
[17]:
```

	name	number	course
0	Francisco Gonçalves	76433	Direito
1	Carlos Costa	78944	Biologia
2	Maria Almeida	74822	Arquitetura

### 3.1.2 Para aceder a uma certa coluna do DataFrame

```
[18]: students_df["course"]
```

```
[18]:
```

0	Direito
1	Biologia
2	Arquitetura

Name: course, dtype: object

```
[19]: students_df.course
```

```
[19]:
```

0	Direito
1	Biologia
2	Arquitetura

Name: course, dtype: object

### 3.1.3 Para aceder a múltiplas colunas do DataFrame

```
[20]: students_df[["number", "course"]]
```

```
[20]:
```

	number	course
0	76433	Direito
1	78944	Biologia
2	74822	Arquitetura

### 3.1.4 Para aceder aos rótulos de todas as colunas do DataFrame

```
[21]: students_df.columns
```

```
[21]: Index(['name', 'number', 'course'], dtype='object')
```

### 3.1.5 Para aceder à informação do primeiro aluno

```
[22]: students_df.iloc[0]
```



```
[22]: name      Francisco Gonçalves
      number      76433
      course      Direito
      Name: 0, dtype: object
```

```
[23]: students_df.loc[0]
```

```
[23]: name      Francisco Gonçalves
      number      76433
      course      Direito
      Name: 0, dtype: object
```

### 3.1.6 Para aceder à informação dos dois primeiros alunos

```
[24]: students_df.iloc[[0,1]]
```

```
[24]:
```

	name	number	course
0	Francisco Gonçalves	76433	Direito
1	Carlos Costa	78944	Biologia

```
[25]: students_df.loc[[0,1]]
```

```
[25]:
```

	name	number	course
0	Francisco Gonçalves	76433	Direito
1	Carlos Costa	78944	Biologia

### 3.1.7 Para aceder ao curso dos dois primeiros alunos

```
[26]: students_df.iloc[[0,1], 2]
```

```
[26]: 0    Direito
      1    Biologia
      Name: course, dtype: object
```

```
[27]: students_df.loc[[0,1], "course"]
```

```
[27]: 0    Direito
      1    Biologia
      Name: course, dtype: object
```

### 3.1.8 Para aceder ao número e ao curso dos dois primeiros alunos

```
[28]: students_df.iloc[[0,1], [1,2]]
```

```
[28]:   number  course
0   76433  Direito
1   78944  Biologia
```

```
[29]: students_df.iloc[0:2, 1:3]
```

```
[29]:   number  course
0   76433  Direito
1   78944  Biologia
```

```
[30]: students_df.loc[[0,1], ["number", "course"]]
```

```
[30]:   number  course
0   76433  Direito
1   78944  Biologia
```

```
[31]: students_df.loc[0:1, "number":"course"]
```

```
[31]:   number  course
0   76433  Direito
1   78944  Biologia
```

Nota: - `iloc` é baseado nas posições inteiras - `loc` é baseado nos rótulos

## 3.2 Índices

### 3.2.1 Para visualizar o índice do DataFrame

```
[32]: students_df.index
```

```
[32]: RangeIndex(start=0, stop=3, step=1)
```

### 3.2.2 Para definir a coluna *course* como o novo índice

```
[33]: students_df.set_index("course", inplace = True)
```

```
[34]: students_df
```

```
[34]:
```

	name	number
course		
Direito	Francisco Gonçalves	76433

Biologia	Carlos Costa	78944
Arquitetura	Maria Almeida	74822

### 3.2.3 Para redefinir o índice

```
[35]: students_df.reset_index(inplace=True)
```

```
[36]: students_df
```

```
[36]:
```

	course	name	number
0	Direito	Francisco Gonçalves	76433
1	Biologia	Carlos Costa	78944
2	Arquitetura	Maria Almeida	74822

### 3.2.4 Para definir a coluna *qname* como índice aquando da leitura do CSV com as perguntas

```
[37]: questions = pd.read_csv("stack-overflow-developer-survey-2021/
    ↪survey_results_schema.csv", index_col = "qname")
```

```
[38]: questions
```

```
[38]:
```

	qid	question \
qname		
S0	QID16	<div><span style="font-size:19px;"><strong>Hel...
MetaInfo	QID12	Browser Meta Info
S1	QID1	<span style="font-size:22px; font-family: aria...
MainBranch	QID2	Which of the following options best describes ...
Employment	QID24	Which of the following best describes your cur...
Country	QID6	Where do you live? <span style="font-weight: b...
US_State	QID7	<p>In which state or territory of the USA do y...
UK_Country	QID9	In which part of the United Kingdom do you liv...
S2	QID190	<span style="font-size:22px; font-family: aria...
EdLevel	QID25	Which of the following best describes the high...
Age1stCode	QID149	At what age did you write your first line of c...
LearnCode	QID276	How did you learn to code? Select all that apply.
YearsCode	QID32	Including any education, how many years have y...
YearsCodePro	QID34	NOT including education, how many years have y...
DevType	QID31	Which of the following describes your current ...
OrgSize	QID29	Approximately how many people are employed by ...
Currency	QID50	Which currency do you use day-to-day? If your ...
CompTotal	QID51	What is your current total compensation (salar...
CompFreq	QID52	Is that compensation weekly, monthly, or yearly?
S3	QID61	<span style="font-size:22px; font-family: aria...

Language	QID233	Which <b>&lt;b&gt;programming, scripting, and markup la...</b>
Database	QID262	Which <b>&lt;b&gt;database environments &lt;/b&gt;have you do...</b>
Platform	QID263	Which <b>&lt;b&gt;cloud platforms&lt;/b&gt;</b> have you done ext...
Webframe	QID264	Which <b>&lt;strong&gt;web frameworks &lt;/strong&gt;&lt;span st...</b>
MiscTech	QID265	Which <b>&lt;b&gt;other frameworks and libraries&lt;/b&gt;</b> ha...
ToolsTech	QID275	Which <b>&lt;strong&gt;tools&lt;/strong&gt;</b> have you done ext...
NEWCollabTools	QID274	Which <b>&lt;strong&gt;development environments&lt;/strong&gt;</b>
OpSys	QID71	What is the primary operating system in which ...
NEWStuck	QID243	What do you do when you get stuck on a problem...
S4	QID91	<b>&lt;span style="font-size:22px; font-family: aria...</b>
NEWSOSites	QID266	Which of the following Stack Overflow sites ha...
SOVisitFreq	QID100	How frequently would you say you visit Stack O...
SOAccount	QID101	Do you have a Stack Overflow account?
SOPartFreq	QID102	How frequently would you say you participate i...
SOComm	QID106	Do you consider yourself a member of the Stack...
NEWOtherComms	QID267	Are you a member of any other online developer...
NEWOtherCommsNames	QID268	Please name up to 5 other online developer com...
S5	QID121	<b>&lt;span style="font-size:22px; font-family: aria...</b>
Age	QID127	What is your age?
Gender	QID122	Which of the following describe you, if any? P...
Trans	QID153	Do you identify as transgender?
Sexuality	QID136	Which of the following describe you, if any? P...
Ethnicity	QID126	Which of the following describe you, if any? P...
Accessibility	QID124	Which of the following describe you, if any? P...
MentalHealth	QID125	Which of the following describe you, if any? P...
S6	QID131	<b>&lt;span style="font-size:22px;"&gt;&lt;strong&gt;Final Qu...</b>
SurveyLength	QID132	How do you feel about the length of the survey...
SurveyEase	QID133	How easy or difficult was this survey to compl...

qname	force_resp	type selector	
S0	False	DB	TB
MetaInfo	False	Meta	Browser
S1	False	DB	TB
MainBranch	True	MC	SAVR
Employment	False	MC	MAVR
Country	True	MC	DL
US_State	False	MC	DL
UK_Country	False	MC	DL
S2	False	DB	TB
EdLevel	False	MC	SAVR
Age1stCode	False	MC	MAVR
LearnCode	False	MC	MAVR
YearsCode	False	MC	DL
YearsCodePro	False	MC	DL
DevType	False	MC	MAVR
OrgSize	False	MC	MAVR

Currency	True	MC	SB
CompTotal	False	TE	SL
CompFreq	False	MC	MAVR
S3	False	DB	TB
Language	False	Matrix	Likert
Database	False	Matrix	Likert
Platform	False	Matrix	Likert
Webframe	False	Matrix	Likert
MiscTech	False	Matrix	Likert
ToolsTech	False	Matrix	Likert
NEWCollabTools	False	Matrix	Likert
OpSys	False	MC	SAVR
NEWStuck	False	MC	MAVR
S4	False	DB	TB
NEWSOSites	False	MC	MAVR
SOVisitFreq	False	MC	MAVR
SOAccount	False	MC	MAVR
SOPartFreq	False	MC	MAVR
SOComm	False	MC	MAVR
NEWOtherComms	False	MC	MAVR
NEWOtherCommsNames	False	Matrix	Likert
S5	False	DB	TB
Age	False	MC	MAVR
Gender	False	MC	MAVR
Trans	False	MC	MAVR
Sexuality	False	MC	MAVR
Ethnicity	False	MC	MAVR
Accessibility	False	MC	MAVR
MentalHealth	False	MC	MAVR
S6	False	DB	TB
SurveyLength	False	MC	MAVR
SurveyEase	False	MC	MAVR

### 3.2.5 Para definir a coluna *ResponseId* como índice aquando da leitura do CSV com as respostas

```
[39]: answers = pd.read_csv("stack-overflow-developer-survey-2021/
↪survey_results_public.csv", index_col = "ResponseId")
```

```
[40]: answers
```

```
[40]:                                     MainBranch  \
ResponseId
1                                I am a developer by profession
2                                I am a student who is learning to code
3                                I am not primarily a developer, but I write co...
```

4	I am a developer by profession
5	I am a developer by profession
...	...
83435	I am a developer by profession
83436	I am a developer by profession
83437	I am a developer by profession
83438	I am a developer by profession
83439	I am a developer by profession

ResponseId	Employment \
1	Independent contractor, freelancer, or self-em...
2	Student, full-time
3	Student, full-time
4	Employed full-time
5	Independent contractor, freelancer, or self-em...
...	...
83435	Employed full-time
83436	Independent contractor, freelancer, or self-em...
83437	Employed full-time
83438	Employed full-time
83439	Employed full-time

ResponseId	Country	US_State \
1	Slovakia	NaN
2	Netherlands	NaN
3	Russian Federation	NaN
4	Austria	NaN
5	United Kingdom of Great Britain and Northern I...	NaN
...	...	...
83435	United States of America	Texas
83436	Benin	NaN
83437	United States of America	New Jersey
83438	Canada	NaN
83439	Brazil	NaN

ResponseId	UK_Country	EdLevel \
1	NaN	Secondary school (e.g. American high school, G...
2	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
3	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
4	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
5	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
...	...	...
83435	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83436	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)

83437	NaN	Secondary school (e.g. American high school, G...
83438	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83439	NaN	Professional degree (JD, MD, etc.)

ResponseId	Age1stCode	LearnCode \
1	18 - 24 years	Coding Bootcamp;Other online resources (ex: vi...
2	11 - 17 years	Other online resources (ex: videos, blogs, etc...
3	11 - 17 years	Other online resources (ex: videos, blogs, etc...
4	11 - 17 years	NaN
5	5 - 10 years	Friend or family member
...	...	...
83435	11 - 17 years	Other online resources (ex: videos, blogs, etc...
83436	11 - 17 years	Other online resources (ex: videos, blogs, etc...
83437	11 - 17 years	School
83438	11 - 17 years	Online Courses or Certification;Books / Physic...
83439	11 - 17 years	School

ResponseId	YearsCode	YearsCodePro \
1	NaN	NaN
2	7	NaN
3	NaN	NaN
4	NaN	NaN
5	17	10
...	...	...
83435	6	5
83436	4	2
83437	10	4
83438	5	3
83439	14	4

ResponseId	DevType \
1	Developer, mobile
2	NaN
3	NaN
4	Developer, front-end
5	Developer, desktop or enterprise applications;...
...	...
83435	Developer, back-end
83436	Developer, full-stack
83437	Data scientist or machine learning specialist;...
83438	Developer, back-end
83439	Developer, front-end;Developer, full-stack;Dev...

OrgSize \

ResponseId	
1	20 to 99 employees
2	NaN
3	NaN
4	100 to 499 employees
5	Just me - I am a freelancer, sole proprietor, ...
...	...
83435	20 to 99 employees
83436	Just me - I am a freelancer, sole proprietor, ...
83437	10,000 or more employees
83438	20 to 99 employees
83439	I don't know

ResponseId	Currency	CompTotal	CompFreq	\
1	EUR European Euro	4800.0	Monthly	
2	NaN	NaN	NaN	
3	NaN	NaN	NaN	
4	EUR European Euro	NaN	Monthly	
5	GBP\tPound sterling	NaN	NaN	
...	...	...	...	
83435	USD\tUnited States dollar	160500.0	Yearly	
83436	XOF\tWest African CFA franc	200000.0	Monthly	
83437	USD\tUnited States dollar	1800.0	Weekly	
83438	CAD\tCanadian dollar	90000.0	Monthly	
83439	BRL\tBrazilian real	7700.0	Monthly	

ResponseId	LanguageHaveWorkedWith	\
1	C++;HTML/CSS;JavaScript;Objective-C;PHP;Swift	
2	JavaScript;Python	
3	Assembly;C;Python;R;Rust	
4	JavaScript;TypeScript	
5	Bash/Shell;HTML/CSS;Python;SQL	
...	...	
83435	Clojure;Kotlin;SQL	
83436	NaN	
83437	Groovy;Java;Python	
83438	Bash/Shell;JavaScript;Node.js;Python	
83439	Delphi;Elixir;HTML/CSS;Java;JavaScript	

ResponseId	LanguageWantToWorkWith	\
1	Swift	
2	NaN	
3	Julia;Python;Rust	
4	JavaScript;TypeScript	



5	Bash/Shell;HTML/CSS;Python;SQL
...	...
83435	Clojure
83436	NaN
83437	Java;Python
83438	Go;Rust
83439	Elixir;HTML/CSS;Java;JavaScript;Node.js;PHP;SQ...

	DatabaseHaveWorkedWith \
ResponseId	
1	PostgreSQL;SQLite
2	PostgreSQL
3	SQLite
4	NaN
5	Elasticsearch;PostgreSQL;Redis
...	...
83435	Oracle;SQLite
83436	Firebase;MariaDB;MySQL;PostgreSQL;Redis;SQLite
83437	DynamoDB;Elasticsearch;MongoDB;PostgreSQL;Redis
83438	Cassandra;Elasticsearch;MongoDB;PostgreSQL;Redis
83439	Oracle;PostgreSQL

	DatabaseWantToWorkWith \
ResponseId	
1	SQLite
2	NaN
3	SQLite
4	NaN
5	Cassandra;Elasticsearch;PostgreSQL;Redis
...	...
83435	SQLite
83436	Firebase;MariaDB;MongoDB;MySQL;PostgreSQL;Redi...
83437	DynamoDB;Redis
83438	NaN
83439	Elasticsearch;MongoDB;MySQL;Oracle;PostgreSQL;...

	PlatformHaveWorkedWith	PlatformWantToWorkWith \
ResponseId		
1	NaN	NaN
2	NaN	NaN
3	Heroku	NaN
4	NaN	NaN
5	NaN	NaN
...	...	...
83435	AWS	AWS
83436	NaN	NaN
83437	AWS;Google Cloud Platform	AWS

83438	Heroku	AWS;DigitalOcean
83439	Microsoft Azure	AWS

WebframeHaveWorkedWith \

ResponseId

1	Laravel;Symfony
2	Angular;Flask;Vue.js
3	Flask
4	Angular;jQuery
5	Flask
...	...
83435	NaN
83436	Django;jQuery;Laravel;React.js;Ruby on Rails
83437	FastAPI;Flask
83438	Django;Express;Flask;React.js
83439	Angular;Spring

WebframeWantToWorkWith \

ResponseId

1	NaN
2	NaN
3	Flask
4	Angular;jQuery
5	Flask
...	...
83435	NaN
83436	Django;Express;jQuery;Laravel;React.js;Ruby on...
83437	FastAPI;Flask
83438	NaN
83439	Express;Laravel;Spring;Symfony

MiscTechHaveWorkedWith \

ResponseId

1	NaN
2	Cordova
3	NumPy;Pandas;TensorFlow;Torch/PyTorch
4	NaN
5	Apache Spark;Hadoop;NumPy;Pandas
...	...
83435	NaN
83436	Flutter;Qt
83437	Hadoop;Keras;NumPy;Pandas
83438	NumPy;Pandas;TensorFlow;Torch/PyTorch
83439	NaN

MiscTechWantToWorkWith \

ResponseId

1		NaN
2		NaN
3	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch	
4		NaN
5	Hadoop;NumPy;Pandas	
...		...
83435		NaN
83436		NaN
83437	Apache Spark;Hadoop;Keras;NumPy;Pandas;TensorFlow	
83438	NumPy;Pandas;TensorFlow;Torch/PyTorch	
83439		NaN

	ToolsTechHaveWorkedWith	ToolsTechWantToWorkWith \
ResponseId		
1	NaN	NaN
2	Docker;Git;Yarn	Git
3	NaN	NaN
4	NaN	NaN
5	Docker;Git;Kubernetes;Yarn	Docker;Git;Kubernetes;Yarn
...	...	...
83435	Docker;Git	Git;Kubernetes
83436	Git;Unity 3D;Unreal Engine	Docker;Git;Kubernetes
83437	Ansible;Docker;Git;Terraform	Docker;Git;Kubernetes;Terraform
83438	Ansible;Docker;Git;Terraform	Kubernetes;Terraform
83439	Docker;Git	Docker;Git;Kubernetes

	NEWCollabToolsHaveWorkedWith \
ResponseId	
1	PHPStorm;Xcode
2	Android Studio;IntelliJ;Notepad++;PyCharm
3	IPython/Jupyter;PyCharm;RStudio;Sublime Text;V...
4	NaN
5	Atom;IPython/Jupyter;Notepad++;PyCharm;Vim
...	...
83435	IntelliJ;Sublime Text;Vim;Visual Studio Code
83436	Android Studio;Eclipse;Emacs;IntelliJ;NetBeans...
83437	Android Studio;Eclipse;IntelliJ;IPython/Jupyte...
83438	PyCharm;Sublime Text
83439	IntelliJ;Visual Studio Code

	NEWCollabToolsWantToWorkWith	OpSys \
ResponseId		
1	Atom;Xcode	MacOS
2	NaN	Windows
3	IPython/Jupyter;RStudio;Sublime Text;Visual St...	MacOS
4	NaN	Windows
5	Atom;IPython/Jupyter;Notepad++;PyCharm;Vim;Vis...	Linux-based

...	...	...
83435	Sublime Text;Vim	MacOS
83436	Emacs;IntelliJ;PHPStorm;PyCharm;RStudio;Sublim...	Linux-based
83437	IntelliJ;IPython/Jupyter;Notepad++;Vim	Windows
83438	NaN	MacOS
83439	IntelliJ;PHPStorm;Visual Studio Code	Linux-based

NEWStuck \

ResponseId

1	Call a coworker or friend;Visit Stack Overflow...
2	Visit Stack Overflow;Google it
3	Visit Stack Overflow;Google it;Watch help / tu...
4	Call a coworker or friend;Visit Stack Overflow...
5	Visit Stack Overflow;Go for a walk or other ph...
...	...
83435	Call a coworker or friend;Google it
83436	Call a coworker or friend;Visit Stack Overflow...
83437	Call a coworker or friend;Visit Stack Overflow...
83438	Call a coworker or friend;Visit Stack Overflow...
83439	Call a coworker or friend;Visit Stack Overflow...

NEWSOSites \

ResponseId

1	Stack Overflow
2	Stack Overflow
3	Stack Overflow;Stack Exchange
4	Stack Overflow
5	Stack Overflow;Stack Exchange
...	...
83435	Stack Overflow;Stack Exchange
83436	Stack Overflow;Stack Exchange
83437	Stack Overflow;Stack Exchange
83438	Stack Overflow
83439	Stack Overflow;Stack Exchange;Stack Overflow f...

SOVisitFreq SOAccount \

ResponseId

1	Multiple times per day	Yes
2	Daily or almost daily	Yes
3	Multiple times per day	Yes
4	Daily or almost daily	Yes
5	Daily or almost daily	Yes
...	...	...
83435	A few times per week	No
83436	Multiple times per day	Yes
83437	A few times per week	Yes
83438	A few times per month or weekly	Yes

83439                      A few times per week                      Yes

SOPartFreq \

ResponseId

1	A few times per month or weekly
2	Daily or almost daily
3	Multiple times per day
4	Daily or almost daily
5	A few times per week
...	...
83435	NaN
83436	I have never participated in Q&A on Stack Over...
83437	I have never participated in Q&A on Stack Over...
83438	Less than once per month or monthly
83439	A few times per week

SOCComm NEWOtherComms

Age Gender Trans \

ResponseId

1	Yes, definitely	No	25-34 years old	Man	No
2	Yes, definitely	No	18-24 years old	Man	No
3	Yes, definitely	Yes	18-24 years old	Man	No
4	Neutral	No	35-44 years old	Man	No
5	Yes, somewhat	No	25-34 years old	Man	No
...	...	...	...	...	...
83435	No, not at all	No	25-34 years old	Man	No
83436	Yes, somewhat	No	18-24 years old	Man	No
83437	No, not really	No	25-34 years old	Man	No
83438	No, not really	No	25-34 years old	Man	No
83439	Yes, somewhat	No	18-24 years old	Man	No

Sexuality

Ethnicity \

ResponseId

1	Straight / Heterosexual	White or of European descent
2	Straight / Heterosexual	White or of European descent
3	Prefer not to say	Prefer not to say
4	Straight / Heterosexual	White or of European descent
5	NaN	White or of European descent
...	...	...
83435	Straight / Heterosexual	White or of European descent
83436	Straight / Heterosexual	Black or of African descent
83437	NaN	White or of European descent
83438	Straight / Heterosexual	White or of European descent
83439	Straight / Heterosexual	Hispanic or Latino/a/x

Accessibility \

ResponseId

1	None of the above
---	-------------------

2	None of the above
3	None of the above
4	I am deaf / hard of hearing
5	None of the above
...	...
83435	None of the above
83436	None of the above
83437	None of the above
83438	None of the above
83439	None of the above

ResponseId	MentalHealth \
1	None of the above
2	None of the above
3	None of the above
4	NaN
5	NaN
...	...
83435	I have a concentration and/or memory disorder ...
83436	None of the above
83437	None of the above
83438	I have a mood or emotional disorder (e.g. depr...
83439	None of the above

ResponseId	SurveyLength	SurveyEase \
1	Appropriate in length	Easy
2	Appropriate in length	Easy
3	Appropriate in length	Easy
4	Appropriate in length	Neither easy nor difficult
5	Appropriate in length	Easy
...	...	...
83435	Appropriate in length	Easy
83436	Appropriate in length	Easy
83437	Appropriate in length	Neither easy nor difficult
83438	Appropriate in length	Neither easy nor difficult
83439	Appropriate in length	Easy

ResponseId	ConvertedCompYearly
1	62268.0
2	NaN
3	NaN
4	NaN
5	NaN
...	...

```

83435          160500.0
83436          3960.0
83437          90000.0
83438          816816.0
83439          21168.0

```

```
[83439 rows x 47 columns]
```

### 3.2.6 Para aceder ao significado da coluna *NEWStuck*

```
[41]: questions.loc["NEWStuck", "question"]
```

```
[41]: 'What do you do when you get stuck on a problem? Select all that apply.'
```

## 3.3 Filtros

### 3.3.1 Para filtrar as respostas dadas por mulheres

```
[42]: answers[answers["Gender"] == "Woman"]
```

```
[42]:
```

		MainBranch \
ResponseId		
8	I am a student who is learning to code	
40	I am a student who is learning to code	
45	I am a developer by profession	
54	I am a developer by profession	
83	I am a student who is learning to code	
...	...	
83395	I am a developer by profession	
83403	I am a developer by profession	
83414	I used to be a developer by profession, but no...	
83422	I am a developer by profession	
83433	I am a developer by profession	
		Employment \
ResponseId		
8	Student, full-time	
40	Student, part-time	
45	Employed full-time	
54	Student, full-time	
83	Student, full-time	
...	...	
83395	Employed full-time	
83403	Employed full-time	

83414	Employed full-time
83422	Independent contractor, freelancer, or self-em...
83433	Employed full-time

ResponseId	Country	US_State	\
8	Malaysia	NaN	
40	India	NaN	
45	France	NaN	
54	United Kingdom of Great Britain and Northern I...	NaN	
83	Netherlands	NaN	
...	...	...	
83395	India	NaN	
83403	South Korea	NaN	
83414	Germany	NaN	
83422	Norway	NaN	
83433	Canada	NaN	

ResponseId	UK_Country	EdLevel	\
8	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
40	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
45	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	
54	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	
83	NaN	Associate degree (A.A., A.S., etc.)	
...	...	...	
83395	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
83403	NaN	Secondary school (e.g. American high school, G...	
83414	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	
83422	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	
83433	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)	

ResponseId	Age1stCode	LearnCode	\
8	11 - 17 years	School;Online Courses or Certification	
40	11 - 17 years	School	
45	18 - 24 years	School	
54	18 - 24 years	Friend or family member;Online Courses or Cert...	
83	11 - 17 years	School	
...	...	...	
83395	11 - 17 years	Books / Physical media	
83403	11 - 17 years	Other online resources (ex: videos, blogs, etc...	
83414	18 - 24 years	Other online resources (ex: videos, blogs, etc...	
83422	11 - 17 years	School;Friend or family member;Online Courses ...	
83433	18 - 24 years	School	

YearsCode	YearsCodePro	\
-----------	--------------	---



ResponseId		
8	4	NaN
40	3	NaN
45	6	Less than 1 year
54	6	NaN
83	5	NaN
...	...	...
83395	9	4
83403	4	Less than 1 year
83414	5	3
83422	20	15
83433	5	Less than 1 year

ResponseId	DevType \
8	NaN
40	NaN
45	Developer, full-stack
54	NaN
83	NaN
...	...
83395	Developer, front-end
83403	Developer, mobile;Developer, front-end;Develop...
83414	Other (please specify):
83422	Developer, full-stack
83433	Developer, back-end

ResponseId	OrgSize	Currency	CompTotal \
8	NaN	NaN	NaN
40	NaN	NaN	NaN
45	10 to 19 employees	EUR European Euro	NaN
54	NaN	NaN	NaN
83	NaN	NaN	NaN
...	...	...	...
83395	100 to 499 employees	INR\tIndian rupee	683000.0
83403	2 to 9 employees	KRW\tSouth Korean won	1860000.0
83414	NaN	NaN	NaN
83422	100 to 499 employees	NOK\tNorwegian krone	820000.0
83433	10,000 or more employees	CAD\tCanadian dollar	106000.0

ResponseId	CompFreq	LanguageHaveWorkedWith \
8	NaN	HTML/CSS;JavaScript;PHP;Ruby;SQL;TypeScript
40	NaN	C;C#;C++;HTML/CSS;JavaScript;Node.js;Python
45	NaN	HTML/CSS;JavaScript;Node.js;Python;R;SQL;TypeS...
54	NaN	PowerShell

83	NaN	Dart;HTML/CSS;JavaScript;PHP;TypeScript
...	...	...
83395	Yearly	HTML/CSS;Java;JavaScript;TypeScript
83403	Monthly	C;Dart;HTML/CSS;Java;JavaScript;Kotlin;Node.js
83414	NaN	Bash/Shell;C#;HTML/CSS;Java;JavaScript;Matlab;...
83422	Yearly	Bash/Shell;HTML/CSS;JavaScript;Node.js;Python;...
83433	Yearly	Ruby

LanguageWantToWorkWith \

ResponseId		
8		Ruby
40		NaN
45		NaN
54		Python
83		Dart;HTML/CSS;JavaScript;PHP;TypeScript
...		...
83395		Node.js
83403		Dart;Kotlin
83414		Go;Python
83422		Bash/Shell;HTML/CSS;JavaScript;Node.js;Python;...
83433		Java;Ruby;TypeScript

DatabaseHaveWorkedWith DatabaseWantToWorkWith \

ResponseId			
8		MySQL;PostgreSQL;SQLite	PostgreSQL
40		MongoDB	NaN
45		PostgreSQL	NaN
54		NaN	NaN
83		MariaDB;MongoDB;MySQL	MariaDB;MongoDB;MySQL
...		...	...
83395		Firebase;MySQL	MongoDB;MySQL;Oracle
83403		Firebase;MariaDB;MongoDB;MySQL;Oracle	Firebase;MySQL;Oracle
83414		Microsoft SQL Server;MySQL;Oracle	NaN
83422		MySQL	DynamoDB;MySQL;Redis
83433		MySQL;PostgreSQL	NaN

PlatformHaveWorkedWith \

ResponseId		
8		Heroku;Microsoft Azure
40		Heroku
45		Google Cloud Platform
54		Google Cloud Platform
83		NaN
...		...
83395		NaN
83403		AWS;Heroku
83414		AWS;Google Cloud Platform;Microsoft Azure

83422	AWS
83433	Google Cloud Platform;Heroku

	PlatformWantToWorkWith \
ResponseId	
8	Heroku
40	NaN
45	NaN
54	Google Cloud Platform
83	NaN
...	...
83395	NaN
83403	AWS
83414	NaN
83422	AWS;Google Cloud Platform;Microsoft Azure
83433	NaN

	WebframeHaveWorkedWith \
ResponseId	
8	Angular.js;jQuery;Ruby on Rails
40	Express;jQuery;React.js
45	Django;Flask;Vue.js
54	NaN
83	jQuery;Laravel;React.js;Vue.js
...	...
83395	Angular;Angular.js;jQuery;Spring
83403	Django;jQuery
83414	ASP.NET;ASP.NET Core ;jQuery
83422	Django;jQuery;React.js
83433	Flask;React.js;Ruby on Rails;Vue.js

	WebframeWantToWorkWith \
ResponseId	
8	Ruby on Rails
40	NaN
45	NaN
54	NaN
83	jQuery;Laravel;React.js
...	...
83395	Express;React.js;Vue.js
83403	React.js;Vue.js
83414	Angular;Angular.js;React.js;Spring;Vue.js
83422	Django;Vue.js
83433	NaN

	MiscTechHaveWorkedWith	MiscTechWantToWorkWith \
ResponseId		

8		NaN	NaN
40	Keras;NumPy;TensorFlow		NaN
45	NumPy;TensorFlow		NaN
54	Keras;NumPy;Torch/PyTorch	NumPy;Torch/PyTorch	
83	Flutter;React Native		Flutter
...		...	
83395		NaN	NaN
83403		Flutter	Flutter;React Native
83414	.NET Framework;.NET Core / .NET 5		NaN
83422		NaN	NaN
83433	NumPy;Pandas;TensorFlow;Torch/PyTorch		NaN

	ToolsTechHaveWorkedWith	ToolsTechWantToWorkWith	\
ResponseId			
8		NaN	NaN
40	Flow;Unity 3D		NaN
45	Docker;Git;Kubernetes		NaN
54	Git		Git
83	Docker;Git		Docker;Git
...	...	...	
83395	Git		NaN
83403	Git		Git;Unity 3D
83414	NaN		NaN
83422	Docker;Git	Docker;Git;Kubernetes;Terraform	
83433	Docker;Git;Kubernetes;Yarn		NaN

	NEWCollabToolsHaveWorkedWith	\
ResponseId		
8	Sublime Text;Visual Studio Code	
40	IPython/Jupyter;Sublime Text;Visual Studio Code	
45	Visual Studio	
54	Notepad++;PyCharm	
83	PHPStorm;Visual Studio Code;Webstorm;Xcode	
...	...	
83395	Eclipse;IntelliJ;Notepad++;Sublime Text;Visual...	
83403	Android Studio;Eclipse;IntelliJ;PyCharm;Visual...	
83414	Eclipse;Notepad++;RStudio;Visual Studio	
83422	IntelliJ;PyCharm;Vim	
83433	Atom;IPython/Jupyter;Vim;Visual Studio Code	

	NEWCollabToolsWantToWorkWith	OpSys	\
ResponseId			
8	Sublime Text;Visual Studio Code	Linux-based	
40		NaN	Linux-based
45		NaN	Linux-based
54	PyCharm	Linux-based	
83	PHPStorm;Webstorm;Xcode		Windows

...	...	...
83395	NaN	Windows
83403	Android Studio;Visual Studio Code;Xcode	MacOS
83414	NaN	Windows
83422	Atom;IntelliJ;PyCharm;Vim;Webstorm	MacOS
83433	NaN	MacOS

NEWStuck \

ResponseId

8	Visit Stack Overflow;Go for a walk or other ph...
40	Visit Stack Overflow;Go for a walk or other ph...
45	Call a coworker or friend;Google it
54	Visit Stack Overflow;Google it;Panic
83	Call a coworker or friend;Visit Stack Overflow...
...	...
83395	Visit Stack Overflow;Google it;Watch help / tu...
83403	Call a coworker or friend;Visit Stack Overflow...
83414	Call a coworker or friend;Visit Stack Overflow...
83422	Call a coworker or friend;Visit Stack Overflow...
83433	Visit Stack Overflow;Go for a walk or other ph...

NEWSOSites \

ResponseId

8	Stack Overflow;Stack Exchange
40	Stack Overflow;Stack Exchange
45	Stack Overflow
54	Stack Overflow;Stack Exchange
83	Stack Overflow
...	...
83395	Stack Overflow;Stack Exchange
83403	Stack Overflow
83414	Stack Overflow
83422	Stack Overflow;Stack Exchange
83433	Stack Overflow;Stack Exchange

SOVisitFreq SOAccount \

ResponseId

8	Multiple times per day	Yes
40	Multiple times per day	Yes
45	A few times per week	No
54	A few times per week	Yes
83	Daily or almost daily	Yes
...	...	...
83395	Daily or almost daily	Yes
83403	Multiple times per day	Yes
83414	Less than once per month or monthly	No
83422	Daily or almost daily	Yes

83433	Daily or almost daily	No
-------	-----------------------	----

SOPartFreq \

ResponseId

8	I have never participated in Q&A on Stack Over...
40	A few times per month or weekly
45	NaN
54	A few times per month or weekly
83	A few times per month or weekly
...	...
83395	I have never participated in Q&A on Stack Over...
83403	I have never participated in Q&A on Stack Over...
83414	NaN
83422	A few times per week
83433	NaN

SOCComm NEWOtherComms

Age Gender Trans \

ResponseId

8	No, not at all	Yes	18-24 years old	Woman	No
40	Yes, somewhat	Yes	18-24 years old	Woman	No
45	Neutral	No	18-24 years old	Woman	No
54	Yes, somewhat	No	25-34 years old	Woman	No
83	Yes, definitely	No	18-24 years old	Woman	No
...	...	...	...	...	...
83395	Yes, somewhat	No	25-34 years old	Woman	No
83403	No, not at all	No	18-24 years old	Woman	No
83414	No, not really	No	35-44 years old	Woman	No
83422	Yes, definitely	No	35-44 years old	Woman	No
83433	No, not really	No	18-24 years old	Woman	No

Sexuality \

ResponseId

8	Straight / Heterosexual
40	Straight / Heterosexual
45	Straight / Heterosexual
54	Straight / Heterosexual
83	Bisexual
...	...
83395	NaN
83403	Bisexual
83414	Straight / Heterosexual
83422	Straight / Heterosexual
83433	Straight / Heterosexual

Ethnicity \

ResponseId

8	White or of European descent;Multiracial;South...
---	---

40	White or of European descent
45	White or of European descent
54	White or of European descent
83	White or of European descent
...	...
83395	Prefer not to say
83403	East Asian
83414	White or of European descent
83422	White or of European descent
83433	East Asian

Accessibility \	
ResponseId	
8	None of the above
40	None of the above
45	None of the above
54	None of the above
83	None of the above
...	...
83395	None of the above
83403	None of the above
83414	None of the above
83422	None of the above
83433	None of the above

MentalHealth \	
ResponseId	
8	None of the above
40	I have a concentration and/or memory disorder ...
45	None of the above
54	I have an anxiety disorder
83	I have a concentration and/or memory disorder ...
...	...
83395	Prefer not to say
83403	None of the above
83414	None of the above
83422	None of the above
83433	None of the above

SurveyLength		SurveyEase \	
ResponseId			
8	Appropriate in length		Easy
40	Appropriate in length		Easy
45	Appropriate in length	Neither easy nor difficult	
54	Appropriate in length		Easy
83	Appropriate in length		Easy
...	...		...

```

83395          Too long  Neither easy nor difficult
83403  Appropriate in length          Easy
83414  Appropriate in length  Neither easy nor difficult
83422  Appropriate in length  Neither easy nor difficult
83433  Appropriate in length          Easy

```

```

ConvertedCompYearly
ResponseId
8          NaN
40         NaN
45         NaN
54         NaN
83         NaN
...
83395      9536.0
83403     18708.0
83414          NaN
83422     88474.0
83433     80169.0

```

```
[4120 rows x 47 columns]
```

### 3.3.2 Para aceder ao nível de educação das mulheres

```
[43]: answers.loc[answers["Gender"] == "Woman", "EdLevel"]
```

```

[43]: ResponseId
8          Bachelor's degree (B.A., B.S., B.Eng., etc.)
40         Bachelor's degree (B.A., B.S., B.Eng., etc.)
45         Master's degree (M.A., M.S., M.Eng., MBA, etc.)
54         Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83         Associate degree (A.A., A.S., etc.)
...
83395          Bachelor's degree (B.A., B.S., B.Eng., etc.)
83403  Secondary school (e.g. American high school, G...
83414          Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83422          Bachelor's degree (B.A., B.S., B.Eng., etc.)
83433          Bachelor's degree (B.A., B.S., B.Eng., etc.)
Name: EdLevel, Length: 4120, dtype: object

```



### 3.3.3 Para aceder ao nível de educação das mulheres cuja idade está entre os 18 e os 24 anos

```
[44]: answers.loc[(answers["Gender"] == "Woman") & (answers["Age"] == "18-24 years_␣  
→old"), "EdLevel"]
```

```
[44]: ResponseId  
8          Bachelor's degree (B.A., B.S., B.Eng., etc.)  
40          Bachelor's degree (B.A., B.S., B.Eng., etc.)  
45          Master's degree (M.A., M.S., M.Eng., MBA, etc.)  
83          Associate degree (A.A., A.S., etc.)  
143         Bachelor's degree (B.A., B.S., B.Eng., etc.)  
  
...  
83256       Secondary school (e.g. American high school, G...  
83350       Secondary school (e.g. American high school, G...  
83379       Master's degree (M.A., M.S., M.Eng., MBA, etc.)  
83403       Secondary school (e.g. American high school, G...  
83433       Bachelor's degree (B.A., B.S., B.Eng., etc.)  
Name: EdLevel, Length: 1282, dtype: object
```

### 3.3.4 Para aceder ao nível de educação das pessoas que são mulheres ou cuja idade está entre os 18 e os 24 anos

```
[45]: answers.loc[(answers["Gender"] == "Woman") | (answers["Age"] == "18-24 years_␣  
→old"), "EdLevel"]
```

```
[45]: ResponseId  
2          Bachelor's degree (B.A., B.S., B.Eng., etc.)  
3          Bachelor's degree (B.A., B.S., B.Eng., etc.)  
6          Bachelor's degree (B.A., B.S., B.Eng., etc.)  
8          Bachelor's degree (B.A., B.S., B.Eng., etc.)  
22         Bachelor's degree (B.A., B.S., B.Eng., etc.)  
  
...  
83427       Bachelor's degree (B.A., B.S., B.Eng., etc.)  
83432       Bachelor's degree (B.A., B.S., B.Eng., etc.)  
83433       Bachelor's degree (B.A., B.S., B.Eng., etc.)  
83436       Bachelor's degree (B.A., B.S., B.Eng., etc.)  
83439       Professional degree (JD, MD, etc.)  
Name: EdLevel, Length: 23831, dtype: object
```

### 3.3.5 Para aceder ao nível de educação das pessoas que não são mulheres e a cuja idade não está entre os 18 e os 24 anos

```
[46]: answers.loc[~((answers["Gender"] == "Woman") | (answers["Age"] == "18-24 years_
↳old")), "EdLevel"]
```

```
[46]: ResponseId
1      Secondary school (e.g. American high school, G...
4      Master's degree (M.A., M.S., M.Eng., MBA, etc.)
5      Master's degree (M.A., M.S., M.Eng., MBA, etc.)
7      Secondary school (e.g. American high school, G...
9      Bachelor's degree (B.A., B.S., B.Eng., etc.)
...
83431   Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83434   Bachelor's degree (B.A., B.S., B.Eng., etc.)
83435   Bachelor's degree (B.A., B.S., B.Eng., etc.)
83437   Secondary school (e.g. American high school, G...
83438   Bachelor's degree (B.A., B.S., B.Eng., etc.)
Name: EdLevel, Length: 59608, dtype: object
```

### 3.3.6 Para aceder ao país, às linguagens com que já trabalharam e à compensação total das pessoas cuja compensação total é superior a 70000\$

```
[47]: answers.loc[answers["CompTotal"] > 70000, ["Country", "LanguageHaveWorkedWith",_
↳"CompTotal"]]
```

```
[47]:
```

	Country \
ResponseId	
13	Germany
25	Germany
27	Switzerland
30	Russian Federation
37	United States of America
...	...
83433	Canada
83434	Brazil
83435	United States of America
83436	Benin
83438	Canada

  

	LanguageHaveWorkedWith	CompTotal
ResponseId		
13	C;C++;Java;Perl;Ruby	71500.0
25	C++;HTML/CSS;Java;JavaScript;Kotlin;Node.js;Ty...	72000.0
27	C++;Python	80000.0
30	Delphi;Java;SQL	200000.0

37	Assembly;C;Java;Kotlin;Rust	103000.0
...	...	...
83433	Ruby	106000.0
83434	Java;JavaScript;Kotlin;Objective-C;TypeScript	80000.0
83435	Clojure;Kotlin;SQL	160500.0
83436	NaN	200000.0
83438	Bash/Shell;JavaScript;Node.js;Python	90000.0

[22491 rows x 3 columns]

### 3.3.7 Para aceder às respostas cujo país toma o valor de Alemanha, Suíça ou Itália

```
[48]: countries = ["Germany", "Switzerland", "Italy"]

answers.loc[answers["Country"].isin(countries)]
```

```
[48]:
```

	MainBranch	\
ResponseId		
13	I am a developer by profession	
21	I am a developer by profession	
25	I am a developer by profession	
26	I am not primarily a developer, but I write co...	
27	I am not primarily a developer, but I write co...	
...	...	
83329	I am a student who is learning to code	
83337	I am a developer by profession	
83414	I used to be a developer by profession, but no...	
83416	I am a developer by profession	
83425	I am a developer by profession	

  

	Employment	Country	\
ResponseId			
13	Employed full-time	Germany	
21	Student, full-time	Germany	
25	Employed full-time	Germany	
26	Employed full-time	Germany	
27	Employed full-time	Switzerland	
...	...	...	
83329	Student, full-time	Italy	
83337	Independent contractor, freelancer, or self-em...	Germany	
83414	Employed full-time	Germany	
83416	Employed full-time	Germany	
83425	Employed full-time	Germany	

  

	US_State	UK_Country	\
ResponseId			

13	NaN	NaN
21	NaN	NaN
25	NaN	NaN
26	NaN	NaN
27	NaN	NaN
...	...	...
83329	NaN	NaN
83337	NaN	NaN
83414	NaN	NaN
83416	NaN	NaN
83425	NaN	NaN

ResponseId	EdLevel	Age1stCode \
13	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years
21	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years
25	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years
26	Other doctoral degree (Ph.D., Ed.D., etc.)	25 - 34 years
27	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years
...	...	...
83329	Some college/university study without earning ...	11 - 17 years
83337	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years
83414	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	18 - 24 years
83416	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years
83425	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years

ResponseId	LearnCode	YearsCode \
13	Other (please specify):	15
21	School;Colleague	NaN
25	School;Friend or family member	26
26	Coding Bootcamp;Online Forum	12
27	Other (please specify):	14
...	...	...
83329	Other online resources (ex: videos, blogs, etc...	7
83337	Other online resources (ex: videos, blogs, etc...	16
83414	Other online resources (ex: videos, blogs, etc...	5
83416	Other online resources (ex: videos, blogs, etc...	33
83425	Other online resources (ex: videos, blogs, etc...	17

ResponseId	YearsCodePro	DevType \
13	6 Developer, desktop or enterprise applications;...	
21	NaN	NaN
25	18 Developer, front-end;Developer, desktop or ent...	
26	12 Academic researcher;Database administrator;Sci...	
27	5 Academic researcher;Scientist;Student	

...	...	...
83329	NaN	NaN
83337	4	Developer, mobile;Developer, front-end;Develop...
83414	3	Other (please specify):
83416	22	Developer, back-end
83425	12	Developer, full-stack;Other (please specify):;...

ResponseId	OrgSize	Currency	CompTotal	CompFreq	\
13	1,000 to 4,999 employees	EUR European Euro	71500.0	Yearly	
21	NaN	NaN	NaN	NaN	
25	1,000 to 4,999 employees	EUR European Euro	72000.0	Yearly	
26	100 to 499 employees	EUR European Euro	NaN	Monthly	
27	5,000 to 9,999 employees	CHF\tswiss franc	80000.0	Yearly	
...	...	...	...	...	
83329	NaN	NaN	NaN	NaN	
83337	2 to 9 employees	EUR European Euro	25000.0	Yearly	
83414	NaN	NaN	NaN	NaN	
83416	100 to 499 employees	EUR European Euro	65.0	Yearly	
83425	10,000 or more employees	EUR European Euro	120000.0	Yearly	

ResponseId	LanguageHaveWorkedWith	\
13	C;C++;Java;Perl;Ruby	
21	Java;Python	
25	C++;HTML/CSS;Java;JavaScript;Kotlin;Node.js;Ty...	
26	HTML/CSS;Julia;Python;R;SQL	
27	C++;Python	
...	...	
83329	C	
83337	Assembly;Bash/Shell;C;Delphi;Haskell;HTML/CSS;...	
83414	Bash/Shell;C#;HTML/CSS;Java;JavaScript;Matlab;...	
83416	C;C#;Java	
83425	Bash/Shell;C;Go;Java;JavaScript;Perl;SQL	

ResponseId	LanguageWantToWorkWith	\
13	Rust	
21	Java;Python	
25	HTML/CSS;Java;JavaScript;Kotlin;Node.js;TypeSc...	
26	HTML/CSS;Julia;Python;R;SQL	
27	C++;Go;Java;Python	
...	...	
83329	C;C++;Python;Rust	
83337	Bash/Shell;C#;HTML/CSS;JavaScript;Node.js;PHP;...	
83414	Go;Python	
83416	C;C#;Java	

83425	Bash/Shell;Java;Rust;SQL
-------	--------------------------

  

	DatabaseHaveWorkedWith \
ResponseId	
13	NaN
21	MySQL;PostgreSQL
25	DynamoDB;PostgreSQL
26	PostgreSQL;SQLite
27	NaN
...	...
83329	NaN
83337	DynamoDB;MariaDB;Microsoft SQL Server;MongoDB;...
83414	Microsoft SQL Server;MySQL;Oracle
83416	NaN
83425	MySQL

	DatabaseWantToWorkWith \
ResponseId	
13	NaN
21	MySQL;PostgreSQL
25	PostgreSQL
26	PostgreSQL
27	NaN
...	...
83329	NaN
83337	DynamoDB;MariaDB;MySQL;SQLite
83414	NaN
83416	NaN
83425	PostgreSQL

	PlatformHaveWorkedWith \
ResponseId	
13	NaN
21	AWS
25	AWS;Heroku
26	NaN
27	NaN
...	...
83329	NaN
83337	AWS;DigitalOcean;Google Cloud Platform;Microso...
83414	AWS;Google Cloud Platform;Microsoft Azure
83416	NaN
83425	AWS;DigitalOcean;Google Cloud Platform

	PlatformWantToWorkWith \
ResponseId	
13	NaN

21	NaN
25	AWS;Heroku
26	NaN
27	NaN
...	...
83329	NaN
83337	AWS
83414	NaN
83416	NaN
83425	NaN

WebframeHaveWorkedWith \	
ResponseId	
13	Ruby on Rails
21	Spring
25	Angular;Express;Spring
26	Django;jQuery
27	NaN
...	...
83329	NaN
83337	Angular;Angular.js;ASP.NET;ASP.NET Core ;Drupa...
83414	ASP.NET;ASP.NET Core ;jQuery
83416	NaN
83425	Angular.js;Spring;Vue.js

WebframeWantToWorkWith \	
ResponseId	
13	NaN
21	Spring
25	Angular;Express;Spring
26	NaN
27	NaN
...	...
83329	NaN
83337	Angular;Angular.js;jQuery;React.js;Symfony
83414	Angular;Angular.js;React.js;Spring;Vue.js
83416	NaN
83425	Spring

MiscTechHaveWorkedWith \	
ResponseId	
13	Qt
21	NumPy;Pandas
25	NaN
26	NumPy;Pandas;TensorFlow
27	NumPy;Pandas
...	...

83329		NaN	
83337	.NET Framework;.NET Core / .NET 5;React Native		
83414	.NET Framework;.NET Core / .NET 5		
83416	.NET Framework		
83425		NaN	

  

	MiscTechWantToWorkWith	ToolsTechHaveWorkedWith \
ResponseId		
13	NumPy;TensorFlow	Git
21	NumPy;Pandas	Git
25	NaN	Docker;Git;Kubernetes
26	NumPy;Pandas;TensorFlow	Docker;Git
27	NaN	Docker;Git
...	...	...
83329	NaN	Git
83337	React Native	Docker;Git;Kubernetes;Unreal Engine;Yarn
83414	NaN	NaN
83416	.NET Framework	Git
83425	NaN	Docker;Git;Kubernetes;Terraform

  

	ToolsTechWantToWorkWith \
ResponseId	
13	Docker;Kubernetes
21	Git
25	Docker;Git;Kubernetes
26	Git
27	Docker;Git
...	...
83329	Git
83337	Docker;Git
83414	NaN
83416	Git
83425	Docker;Git;Kubernetes

  

	NEWCollabToolsHaveWorkedWith \
ResponseId	
13	Vim
21	IntelliJ;PyCharm
25	Android Studio;IntelliJ;Visual Studio Code
26	Atom;RStudio;Vim
27	IntelliJ;IPython/Jupyter
...	...
83329	Visual Studio Code
83337	Android Studio;Atom;Eclipse;IntelliJ;NetBeans;...
83414	Eclipse;Notepad++;RStudio;Visual Studio
83416	Notepad++;Visual Studio
83425	IntelliJ;Neovim;Vim



# NEWCollabToolsWantToWorkWith \

ResponseId	
13	Vim;Visual Studio Code
21	IntelliJ;PyCharm
25	Android Studio;IntelliJ;Visual Studio Code
26	Atom;RStudio;Vim
27	IntelliJ;IPython/Jupyter
...	...
83329	Visual Studio Code
83337	PHPStorm;Visual Studio Code;Webstorm
83414	NaN
83416	Notepad++;Visual Studio
83425	IntelliJ;Neovim

# OpSys \

ResponseId	
13	Linux-based
21	Windows
25	Linux-based
26	Linux-based
27	Linux-based
...	...
83329	Windows Subsystem for Linux (WSL)
83337	MacOS
83414	Windows
83416	Windows
83425	MacOS

# NEWStuck \

ResponseId	
13	Visit Stack Overflow;Google it;Watch help / tu...
21	Visit Stack Overflow;Google it
25	Call a coworker or friend;Visit Stack Overflow...
26	Visit Stack Overflow;Go for a walk or other ph...
27	Visit Stack Overflow;Go for a walk or other ph...
...	...
83329	Visit Stack Overflow;Google it;Do other work a...
83337	Visit Stack Overflow;Go for a walk or other ph...
83414	Call a coworker or friend;Visit Stack Overflow...
83416	Call a coworker or friend;Visit Stack Overflow...
83425	Call a coworker or friend;Visit Stack Overflow...

# NEWSOSites \

ResponseId	
13	Stack Overflow
21	Stack Overflow

25	Stack Overflow
26	Stack Overflow;Stack Exchange
27	Stack Overflow;Stack Exchange
...	...
83329	Stack Overflow;Stack Exchange
83337	Stack Overflow
83414	Stack Overflow
83416	Stack Overflow;Stack Exchange
83425	Stack Overflow;Stack Exchange

	SOVisitFreq	SOAccount	\
ResponseId			
13	Multiple times per day	Yes	
21	A few times per month or weekly	Yes	
25	Multiple times per day	Yes	
26	A few times per week	Yes	
27	Multiple times per day	Yes	
...	...	...	
83329	A few times per week	Yes	
83337	Daily or almost daily	No	
83414	Less than once per month or monthly	No	
83416	Daily or almost daily	Yes	
83425	A few times per week	Yes	

	SOPartFreq	\
ResponseId		
13	Daily or almost daily	
21	Less than once per month or monthly	
25	A few times per week	
26	Less than once per month or monthly	
27	I have never participated in Q&A on Stack Over...	
...	...	
83329	Less than once per month or monthly	
83337	NaN	
83414	NaN	
83416	Daily or almost daily	
83425	Less than once per month or monthly	

	SOCComm	NEWOtherComms	Age	\
ResponseId				
13	Yes, definitely	No	25-34 years old	
21	Neutral	No	25-34 years old	
25	Yes, somewhat	No	35-44 years old	
26	Neutral	No	35-44 years old	
27	Neutral	No	25-34 years old	
...	...	...	...	
83329	No, not really	No	18-24 years old	

83337	Not sure	No	18-24 years old
83414	No, not really	No	35-44 years old
83416	Yes, somewhat	No	45-54 years old
83425	No, not really	No	25-34 years old

ResponseId		Gender \
13		Man
21		Man
25		Man
26	Non-binary, genderqueer, or gender non-conforming	
27		Man
...		...
83329		Man
83337		Man
83414		Woman
83416		Man
83425		Man

ResponseId	Trans	Sexuality \
13	No	Straight / Heterosexual
21	No	NaN
25	No	Straight / Heterosexual
26	Prefer not to say	Bisexual
27	No	NaN
...	...	...
83329	No	Straight / Heterosexual
83337	No	Straight / Heterosexual
83414	No	Straight / Heterosexual
83416	No	Straight / Heterosexual
83425	No	Straight / Heterosexual

ResponseId	Ethnicity	Accessibility \
13	White or of European descent	None of the above
21	White or of European descent	NaN
25	White or of European descent	None of the above
26	White or of European descent	None of the above
27	White or of European descent	None of the above
...	...	...
83329	White or of European descent	None of the above
83337	White or of European descent	None of the above
83414	White or of European descent	None of the above
83416	White or of European descent	None of the above
83425	White or of European descent	None of the above

ResponseId	MentalHealth	SurveyLength \
13	Prefer not to say	Appropriate in length
21	NaN	Too long
25	None of the above	Appropriate in length
26	I have an anxiety disorder	Appropriate in length
27	None of the above	Appropriate in length
...	...	...
83329	None of the above	Appropriate in length
83337	None of the above	Appropriate in length
83414	None of the above	Appropriate in length
83416	None of the above	Appropriate in length
83425	Or, in your own words:	Appropriate in length

ResponseId	SurveyEase	ConvertedCompYearly
13	Easy	77290.0
21	Easy	NaN
25	Easy	77831.0
26	Neither easy nor difficult	NaN
27	Easy	81319.0
...	...	...
83329	Easy	NaN
83337	Neither easy nor difficult	27025.0
83414	Neither easy nor difficult	NaN
83416	Easy	70.0
83425	Easy	129718.0

[8213 rows x 47 columns]

### 3.3.8 Para aceder às respostas cujo campo com as linguagens com que já trabalharam inclui Python

```
[49]: answers.loc[answers["LanguageHaveWorkedWith"].str.contains("Python", na =_
→False), "LanguageHaveWorkedWith"]
```

```
[49]: ResponseId
2          JavaScript;Python
3      Assembly;C;Python;R;Rust
5      Bash/Shell;HTML/CSS;Python;SQL
6      C;C#;C++;HTML/CSS;Java;JavaScript;Node.js;Powe...
10         C++;Python
...
83430      HTML/CSS;PHP;PowerShell;Python;SQL;VBA
83431      APL;Clojure;LISP;Python;Ruby;SQL;TypeScript
83432      C#;Dart;HTML/CSS;Java;JavaScript;Kotlin;Node.j...
```

```
83437                                Groovy;Java;Python
83438                                Bash/Shell;JavaScript;Node.js;Python
Name: LanguageHaveWorkedWith, Length: 39792, dtype: object
```

## 3.4 Alterar linhas e colunas

### 3.4.1 Para alterar os rótulos das colunas

```
[50]: students_df.columns = ["university course", "full name", "id"]
```

```
[51]: students_df
```

```
[51]:  university course      full name    id
0      Direito  Francisco Gonçalves  76433
1      Biologia    Carlos Costa    78944
2  Arquitetura    Maria Almeida    74822
```

```
[52]: students_df.rename(columns={"university course": "course", "full name": "name",
↪ "id": "number"}, inplace = True)
```

```
[53]: students_df
```

```
[53]:      course      name  number
0  Direito  Francisco Gonçalves  76433
1  Biologia    Carlos Costa    78944
2  Arquitetura    Maria Almeida  74822
```

```
[54]: students_df.columns = [x.upper() for x in students_df.columns]
```

```
[55]: students_df
```

```
[55]:      COURSE      NAME  NUMBER
0  Direito  Francisco Gonçalves  76433
1  Biologia    Carlos Costa    78944
2  Arquitetura    Maria Almeida  74822
```

### 3.4.2 Para alterar a informação do terceiro aluno

```
[56]: students_df.loc[2] = ["Medicina", "Fabiana Silva", "74877"]
```

```
[57]: students_df
```

```
[57]:      COURSE      NAME  NUMBER
0  Direito  Francisco Gonçalves  76433
```

1	Biologia	Carlos Costa	78944
2	Medicina	Fabiana Silva	74877

### 3.4.3 Para alterar o nome do terceiro aluno

```
[58]: students_df.loc[2, "NAME"] = "Guilherme Costa"
```

```
[59]: students_df
```

```
[59]:
```

	COURSE	NAME	NUMBER
0	Direito	Francisco Gonçalves	76433
1	Biologia	Carlos Costa	78944
2	Medicina	Guilherme Costa	74877

```
[60]: students_df.at[2, "NAME"] = "Fabiana Silva"
```

```
[61]: students_df
```

```
[61]:
```

	COURSE	NAME	NUMBER
0	Direito	Francisco Gonçalves	76433
1	Biologia	Carlos Costa	78944
2	Medicina	Fabiana Silva	74877

### 3.4.4 Para alterar o curso e o número do terceiro aluno

```
[62]: students_df.loc[2, ["COURSE", "NUMBER"]] = ["Arqueologia", "76877"]
```

```
[63]: students_df
```

```
[63]:
```

	COURSE	NAME	NUMBER
0	Direito	Francisco Gonçalves	76433
1	Biologia	Carlos Costa	78944
2	Arqueologia	Fabiana Silva	76877

### 3.4.5 Para alterar todos os números cujo valor seja 76877

```
[64]: students_df.loc[students_df["NUMBER"] == "76877", "NUMBER"] = 76855
```

```
[65]: students_df
```

```
[65]:
```

	COURSE	NAME	NUMBER
0	Direito	Francisco Gonçalves	76433
1	Biologia	Carlos Costa	78944

2 Arqueologia Fabiana Silva 76855

### 3.4.6 Para passar todos os cursos para minúsculas

```
[66]: students_df["COURSE"] = students_df["COURSE"].str.lower()
```

```
[67]: students_df
```

```
[67]:
```

	COURSE	NAME	NUMBER
0	direito	Francisco Gonçalves	76433
1	biologia	Carlos Costa	78944
2	arqueologia	Fabiana Silva	76855

### 3.4.7 Para visualizar o comprimento de todos os nomes

```
[68]: students_df["NAME"].apply(len)
```

```
[68]: 0    19  
      1    12  
      2    13  
      Name: NAME, dtype: int64
```

### 3.4.8 Para visualizar o número de valores em cada linha

```
[69]: students_df.apply(len, axis = "columns")
```

```
[69]: 0    3  
      1    3  
      2    3  
      dtype: int64
```

### 3.4.9 Para colocar o prefixo em todos os números

```
[70]: def update_number(number):  
      return "pg"+str(number)
```

```
[71]: students_df["NUMBER"] = students_df["NUMBER"].apply(update_number)
```

```
[72]: students_df
```

```
[72]:
```

	COURSE	NAME	NUMBER
0	direito	Francisco Gonçalves	pg76433

1	biologia	Carlos Costa	pg78944
2	arqueologia	Fabiana Silva	pg76855

### 3.4.10 Para retirar o prefixo de todos os números

```
[73]: students_df["NUMBER"] = students_df["NUMBER"].apply(lambda x: x[2:])
```

```
[74]: students_df
```

```
[74]:
```

	COURSE	NAME	NUMBER
0	direito	Francisco Gonçalves	76433
1	biologia	Carlos Costa	78944
2	arqueologia	Fabiana Silva	76855

### 3.4.11 Para visualizar o mínimo de todas as colunas

```
[75]: students_df.apply(pd.Series.min)
```

```
[75]:
```

COURSE	arqueologia
NAME	Carlos Costa
NUMBER	76433

dtype: object

```
[76]: students_df.apply(lambda x: x.min())
```

```
[76]:
```

COURSE	arqueologia
NAME	Carlos Costa
NUMBER	76433

dtype: object

### 3.4.12 Para aceder ao comprimento de todos os valores do DataFrame

```
[77]: students_df.applymap(len)
```

```
[77]:
```

	COURSE	NAME	NUMBER
0	7	19	5
1	8	12	5
2	11	13	5



### 3.4.13 Para alterar os nomes Francisco Gonçalves e Carlos Costa

```
[78]: students_df["NAME"].map({"Francisco Gonçalves": "Francisco", "Carlos Costa":  
    ↳ "Carlos"})
```

```
[78]: 0    Francisco  
      1      Carlos  
      2         NaN  
      Name: NAME, dtype: object
```

```
[79]: students_df["NAME"] = students_df["NAME"].replace({"Francisco Gonçalves":  
    ↳ "Francisco", "Carlos Costa": "Carlos"})
```

```
[80]: students_df
```

```
[80]:
```

	COURSE	NAME	NUMBER
0	direito	Francisco	76433
1	biologia	Carlos	78944
2	arqueologia	Fabiana Silva	76855

## 3.5 Adicionar/remover linhas e colunas

### 3.5.1 Para criar uma nova coluna que vai ter o nome e o número separados por um hífen

```
[81]: students_df["NAME_NUMBER"] = students_df["NAME"] + " - " + students_df["NUMBER"]
```

```
[82]: students_df
```

```
[82]:
```

	COURSE	NAME	NUMBER	NAME_NUMBER
0	direito	Francisco	76433	Francisco - 76433
1	biologia	Carlos	78944	Carlos - 78944
2	arqueologia	Fabiana Silva	76855	Fabiana Silva - 76855

### 3.5.2 Para eliminar colunas

```
[83]: students_df.drop(columns = ["NAME", "NUMBER"], inplace = True)
```

```
[84]: students_df
```

```
[84]:
```

	COURSE	NAME_NUMBER
0	direito	Francisco - 76433
1	biologia	Carlos - 78944
2	arqueologia	Fabiana Silva - 76855

### 3.5.3 Para criar duas novas colunas que vão ter a parte antes do hífen e a parte depois do hífen da coluna *NAME\_NUMBER*

```
[85]: students_df[["NAME", "NUMBER"]] = students_df["NAME_NUMBER"].str.split(" - ",  
    ↪ expand = True)
```

```
[86]: students_df
```

```
[86]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855

### 3.5.4 Para adicionar uma nova linha

```
[87]: students_df.append({"NAME": "Rui"}, ignore_index = True)
```

```
[87]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	NaN	NaN	Rui	NaN

### 3.5.5 Para adicionar um novo DataFrame

```
[88]: new_students = {  
    "NAME": ["Vitor", "Joana", "Ricardo"],  
    "NUMBER": [76133, 78144, 74122],  
    "COURSE": ["Marketing", "Marketing", "Marketing"]  
}
```

```
[89]: new_students_df = pd.DataFrame(new_students)
```

```
[90]: new_students_df
```

```
[90]:
```

	NAME	NUMBER	COURSE
0	Vitor	76133	Marketing
1	Joana	78144	Marketing
2	Ricardo	74122	Marketing

```
[91]: students_df = students_df.append(new_students_df, ignore_index = True)
```

```
[92]: students_df
```

```
[92]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	Marketing	NaN	Vitor	76133
4	Marketing	NaN	Joana	78144
5	Marketing	NaN	Ricardo	74122

### 3.5.6 Para eliminar a sexta linha

```
[93]: students_df.drop(index = 5)
```

```
[93]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	Marketing	NaN	Vitor	76133
4	Marketing	NaN	Joana	78144

### 3.5.7 Para eliminar as linhas onde o nome toma o valor de Carlos

```
[94]: students_df.drop(index = students_df[students_df["NAME"] == "Carlos"].index)
```

```
[94]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	Marketing	NaN	Vitor	76133
4	Marketing	NaN	Joana	78144
5	Marketing	NaN	Ricardo	74122

## 3.6 Ordenar dados

### 3.6.1 Para ordenar os valores da coluna *NAME*

```
[95]: students_df["NAME"].sort_values()
```

```
[95]: 1          Carlos
      2  Fabiana Silva
      0          Francisco
      4           Joana
      5          Ricardo
      3           Vitor
      Name: NAME, dtype: object
```

### 3.6.2 Para ordenar os valores segundo o curso

```
[96]: students_df.sort_values(by="COURSE")
```

```
[96]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
3	Marketing	NaN	Vitor	76133
4	Marketing	NaN	Joana	78144
5	Marketing	NaN	Ricardo	74122
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
1	biologia	Carlos - 78944	Carlos	78944
0	direito	Francisco - 76433	Francisco	76433

### 3.6.3 Para ordenar os valores por ordem decrescente segundo o curso

```
[97]: students_df.sort_values(by="COURSE", ascending = False)
```

```
[97]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	Marketing	NaN	Vitor	76133
4	Marketing	NaN	Joana	78144
5	Marketing	NaN	Ricardo	74122

### 3.6.4 Para ordenar os valores por ordem decrescente segundo o curso e, depois, segundo o nome

```
[98]: students_df.sort_values(by=["COURSE", "NAME"], ascending = False)
```

```
[98]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	Marketing	NaN	Vitor	76133
5	Marketing	NaN	Ricardo	74122
4	Marketing	NaN	Joana	78144

### 3.6.5 Para ordenar os valores por ordem decrescente segundo o curso e, depois, por ordem crescente segundo o nome

```
[99]: students_df.sort_values(by=["COURSE", "NAME"], ascending = [False, True],  
    ↪ inplace = True)
```

```
[100]: students_df
```

```
[100]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
4	Marketing	NaN	Joana	78144
5	Marketing	NaN	Ricardo	74122
3	Marketing	NaN	Vitor	76133

### 3.6.6 Para ordenar os valores segundo o índice

```
[101]: students_df.sort_index()
```

```
[101]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
0	direito	Francisco - 76433	Francisco	76433
1	biologia	Carlos - 78944	Carlos	78944
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
3	Marketing	NaN	Vitor	76133
4	Marketing	NaN	Joana	78144
5	Marketing	NaN	Ricardo	74122

### 3.6.7 Para visualizar os tipos das colunas

```
[102]: students_df.dtypes
```

```
[102]: COURSE      object
NAME_NUMBER  object
NAME         object
NUMBER       object
dtype: object
```

### 3.6.8 Para alterar o tipo da coluna *NUMBER*

```
[103]: students_df["NUMBER"] = students_df["NUMBER"].astype(int)
```

### 3.6.9 Para aceder aos 4 maiores valores da coluna *NUMBER*

```
[104]: students_df["NUMBER"].nlargest(4)
```

```
[104]: 1    78944
      4    78144
```

```

2    76855
0    76433
Name: NUMBER, dtype: int64

```

### 3.6.10 Para aceder às linhas com os 4 maiores valores da coluna *NUMBER*

```
[105]: students_df.nlargest(4, "NUMBER")
```

```
[105]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
1	biologia	Carlos - 78944	Carlos	78944
4	Marketing	NaN	Joana	78144
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855
0	direito	Francisco - 76433	Francisco	76433

### 3.6.11 Para aceder aos 4 menores valores da coluna *NUMBER*

```
[106]: students_df["NUMBER"].nsmallest(4)
```

```
[106]:
```

5	74122
3	76133
0	76433
2	76855

Name: NUMBER, dtype: int64

### 3.6.12 Para aceder às linhas com os 4 menores valores da coluna *NUMBER*

```
[107]: students_df.nsmallest(4, "NUMBER")
```

```
[107]:
```

	COURSE	NAME_NUMBER	NAME	NUMBER
5	Marketing	NaN	Ricardo	74122
3	Marketing	NaN	Vitor	76133
0	direito	Francisco - 76433	Francisco	76433
2	arqueologia	Fabiana Silva - 76855	Fabiana Silva	76855

## 3.7 Agrupar e agregar

### 3.7.1 Para obter a mediana de todas as colunas com valores numéricos

```
[108]: answers.median()
```

```
[108]:
```

CompTotal	67000.0
ConvertedCompYearly	56211.0

```
dtype: float64
```

### 3.7.2 Para obter a mediana da coluna *CompTotal*

```
[109]: answers["CompTotal"].median()
```

```
[109]: 67000.0
```

### 3.7.3 Para obter medidas de tendência e dispersão

```
[110]: answers.describe()
```

```
[110]:
```

	CompTotal	ConvertedCompYearly
count	4.718300e+04	4.684400e+04
mean	2.119407e+69	1.184262e+05
std	4.603702e+71	5.272944e+05
min	0.000000e+00	1.000000e+00
25%	1.600000e+04	2.702500e+04
50%	6.700000e+04	5.621100e+04
75%	1.400000e+05	1.000000e+05
max	1.000000e+74	4.524131e+07

### 3.7.4 Para obter o número de valores não nulos da coluna *CompTotal*

```
[111]: answers["CompTotal"].count()
```

```
[111]: 47183
```

### 3.7.5 Para obter o número de pessoas que responderam às diferentes opções da questão *SurveyEase*

```
[112]: answers["SurveyEase"].value_counts()
```

```
[112]: Easy                                63087
Neither easy nor difficult             18091
Difficult                             770
Name: SurveyEase, dtype: int64
```

### 3.7.6 Para obter a percentagem de pessoas que responderam às diferentes opções da questão SurveyEase

```
[113]: answers["SurveyEase"].value_counts(normalize = True)
```

```
[113]: Easy                0.769842
      Neither easy nor difficult  0.220762
      Difficult             0.009396
      Name: SurveyEase, dtype: float64
```

### 3.7.7 Para agrupar os valores pelo país

```
[114]: country_group = answers.groupby(["Country"])
```

### 3.7.8 Para obter os valores cujo país é Estados Unidos da América

```
[115]: country_group.get_group("United States of America")
```

```
[115]:
```

	MainBranch \
ResponseId	
6	I am a student who is learning to code
7	I code primarily as a hobby
16	I am a student who is learning to code
37	I am a developer by profession
38	I am a developer by profession
...	...
83428	I am a developer by profession
83430	I code primarily as a hobby
83431	I am a developer by profession
83435	I am a developer by profession
83437	I am a developer by profession

  

	Employment	Country \
ResponseId		
6	Student, part-time	United States of America
7	I prefer not to say	United States of America
16	Student, full-time	United States of America
37	Employed full-time	United States of America
38	Employed full-time	United States of America
...	...	...
83428	Employed full-time	United States of America
83430	Not employed, but looking for work	United States of America
83431	Employed full-time	United States of America
83435	Employed full-time	United States of America



83437                                      Employed full-time    United States of America

	US_State	UK_Country	\
ResponseId			
6	Georgia		NaN
7	New Hampshire		NaN
16	Missouri		NaN
37	District of Columbia		NaN
38	Massachusetts		NaN
...	...	...	
83428	Pennsylvania		NaN
83430	Washington		NaN
83431	Illinois		NaN
83435	Texas		NaN
83437	New Jersey		NaN

	EdLevel	Age1stCode	\
ResponseId			
6	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	
7	Secondary school (e.g. American high school, G...	11 - 17 years	
16	Secondary school (e.g. American high school, G...	5 - 10 years	
37	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	
38	Some college/university study without earning ...	18 - 24 years	
...	...	...	
83428	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	
83430	Bachelor's degree (B.A., B.S., B.Eng., etc.)	18 - 24 years	
83431	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	11 - 17 years	
83435	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	
83437	Secondary school (e.g. American high school, G...	11 - 17 years	

	LearnCode	YearsCode	\
ResponseId			
6	Other online resources (ex: videos, blogs, etc...	NaN	
7	Other online resources (ex: videos, blogs, etc...	3	
16	Other (please specify):	7	
37	Other online resources (ex: videos, blogs, etc...	8	
38	Other online resources (ex: videos, blogs, etc)	20	
...	...	...	
83428	Other online resources (ex: videos, blogs, etc...	13	
83430	Other online resources (ex: videos, blogs, etc)	6	
83431	Other online resources (ex: videos, blogs, etc...	23	
83435	Other online resources (ex: videos, blogs, etc...	6	
83437	School	10	

	YearsCodePro	\
ResponseId		
6	NaN	

7	NaN
16	NaN
37	Less than 1 year
38	15
...	...
83428	2
83430	NaN
83431	21
83435	5
83437	4

ResponseId	DevType \
6	NaN
7	NaN
16	NaN
37	Developer, embedded applications or devices
38	Developer, back-end
...	...
83428	Developer, front-end;Developer, desktop or ent...
83430	Other (please specify):;Student
83431	Developer, front-end;Developer, full-stack;Dev...
83435	Developer, back-end
83437	Data scientist or machine learning specialist;...

ResponseId	OrgSize	Currency	CompTotal \
6	NaN	NaN	NaN
7	NaN	NaN	NaN
16	NaN	NaN	NaN
37	20 to 99 employees	USD\tUnited States dollar	103000.0
38	1,000 to 4,999 employees	USD\tUnited States dollar	300000.0
...	...	...	...
83428	1,000 to 4,999 employees	USD\tUnited States dollar	86000.0
83430	NaN	NaN	NaN
83431	10 to 19 employees	USD\tUnited States dollar	125000.0
83435	20 to 99 employees	USD\tUnited States dollar	160500.0
83437	10,000 or more employees	USD\tUnited States dollar	1800.0

ResponseId	CompFreq	LanguageHaveWorkedWith \
6	NaN	C;C#;C++;HTML/CSS;Java;JavaScript;Node.js;Powe...
7	NaN	HTML/CSS;JavaScript
16	NaN	Bash/Shell;Python
37	Yearly	Assembly;C;Java;Kotlin;Rust
38	Yearly	Go
...	...	...

83428	Weekly	Java;Python
83430	NaN	HTML/CSS;PHP;PowerShell;Python;SQL;VBA
83431	Yearly	APL;Clojure;LISP;Python;Ruby;SQL;TypeScript
83435	Yearly	Clojure;Kotlin;SQL
83437	Weekly	Groovy;Java;Python

	LanguageWantToWorkWith \
ResponseId	
6	C#;C++;Go;HTML/CSS;Java;JavaScript;Node.js;Obj...
7	HTML/CSS;JavaScript;PHP
16	Bash/Shell;Python
37	Assembly;Kotlin;Rust;SQL
38	Go;Rust
...	...
83428	C#;Java;Python
83430	C#;Go;HTML/CSS;Java;JavaScript;PHP;Python;SQL;VBA
83431	APL;Clojure;Haskell;LISP;R
83435	Clojure
83437	Java;Python

	DatabaseHaveWorkedWith \
ResponseId	
6	MySQL;PostgreSQL;SQLite
7	NaN
16	NaN
37	NaN
38	NaN
...	...
83428	NaN
83430	MongoDB;MySQL;PostgreSQL
83431	MongoDB;MySQL;PostgreSQL;Redis
83435	Oracle;SQLite
83437	DynamoDB;Elasticsearch;MongoDB;PostgreSQL;Redis

	DatabaseWantToWorkWith \
ResponseId	
6	Elasticsearch;Firebase;IBM DB2;MariaDB;Microso...
7	NaN
16	NaN
37	NaN
38	NaN
...	...
83428	NaN
83430	MariaDB;Microsoft SQL Server;MongoDB;MySQL;Pos...
83431	PostgreSQL
83435	SQLite
83437	DynamoDB;Redis

ResponseId	PlatformHaveWorkedWith \
6	NaN
7	NaN
16	NaN
37	NaN
38	AWS;Google Cloud Platform;Microsoft Azure
...	...
83428	NaN
83430	Heroku
83431	AWS;DigitalOcean;Google Cloud Platform;Heroku
83435	AWS
83437	AWS;Google Cloud Platform

ResponseId	PlatformWantToWorkWith \
6	NaN
7	NaN
16	NaN
37	NaN
38	NaN
...	...
83428	NaN
83430	AWS;Heroku;IBM Cloud or Watson;Microsoft Azure...
83431	AWS;DigitalOcean;Google Cloud Platform
83435	AWS
83437	AWS

ResponseId	WebframeHaveWorkedWith \
6	Express;Flask;jQuery;React.js
7	jQuery
16	NaN
37	NaN
38	NaN
...	...
83428	Angular;Flask
83430	Django;Flask;jQuery
83431	Django;React.js;Ruby on Rails
83435	NaN
83437	FastAPI;Flask

ResponseId	WebframeWantToWorkWith \
6	Express;Flask;jQuery;React.js
7	jQuery

16		NaN
37		NaN
38		NaN
...		...
83428		Angular
83430	Angular.js;ASP.NET;ASP.NET Core ;Django;FastAP...	
83431		NaN
83435		NaN
83437		FastAPI;Flask

MiscTechHaveWorkedWith \		
ResponseId		
6	Keras;NumPy;Pandas;TensorFlow;Torch/PyTorch	
7		NaN
16		NaN
37		NaN
38		NaN
...		...
83428		NaN
83430	NumPy;Pandas	
83431		NaN
83435		NaN
83437	Hadoop;Keras;NumPy;Pandas	

MiscTechWantToWorkWith \		
ResponseId		
6	Keras;NumPy;Pandas;Qt;React Native;TensorFlow;...	
7		NaN
16		NaN
37		NaN
38		NaN
...		...
83428		NaN
83430	.NET Framework;.NET Core / .NET 5;NumPy;Pandas	
83431		NaN
83435		NaN
83437	Apache Spark;Hadoop;Keras;NumPy;Pandas;TensorFlow	

ToolsTechHaveWorkedWith		ToolsTechWantToWorkWith \	
ResponseId			
6	Git Docker;Git;Unity 3D;Unreal Engine		
7	NaN		NaN
16	Git		Git
37	Docker;Git		Git
38	Docker;Git;Terraform		Git;Terraform
...	...		...
83428	Ansible;Git;Terraform;Unity 3D		Ansible;Git;Terraform;Unity 3D

83430		Git	Docker;Git;Xamarin
83431		Docker;Git	Docker;Git;Kubernetes;Unity 3D
83435		Docker;Git	Git;Kubernetes
83437	Ansible;Docker;Git;Terraform		Docker;Git;Kubernetes;Terraform

#### NEWCollabToolsHaveWorkedWith \

ResponseId

6	IPython/Jupyter;Notepad++;PyCharm;Sublime Text...
7	NaN
16	Emacs;Neovim;Vim
37	IntelliJ;PyCharm;Webstorm
38	Vim;Visual Studio Code
...	...
83428	Eclipse;IntelliJ;NetBeans;Sublime Text;Visual ...
83430	Atom;Notepad++;Sublime Text;Visual Studio Code
83431	Emacs;Vim
83435	IntelliJ;Sublime Text;Vim;Visual Studio Code
83437	Android Studio;Eclipse;IntelliJ;IPython/Jupyte...

#### NEWCollabToolsWantToWorkWith

OpSys \

ResponseId

6	Android Studio;IPython/Jupyter;Vim;Visual Stud...	Windows
7	NaN	Windows
16	Neovim;Vim	Linux-based
37	Android Studio;IntelliJ;PyCharm;Sublime Text;W...	Linux-based
38	Vim;Visual Studio Code	MacOS
...	...	...
83428	IntelliJ;Sublime Text;Visual Studio Code	Windows
83430	Atom;Notepad++;Sublime Text;Visual Studio Code	Windows
83431	Emacs	Linux-based
83435	Sublime Text;Vim	MacOS
83437	IntelliJ;IPython/Jupyter;Notepad++;Vim	Windows

#### NEWStuck \

ResponseId

6	Visit Stack Overflow;Go for a walk or other ph...
7	Call a coworker or friend;Visit Stack Overflow...
16	Call a coworker or friend;Visit Stack Overflow...
37	Visit Stack Overflow;Google it;Do other work a...
38	Google it;Do other work and come back later;Me...
...	...
83428	Call a coworker or friend;Visit Stack Overflow...
83430	Visit Stack Overflow;Google it;Watch help / tu...
83431	Call a coworker or friend;Visit Stack Overflow...
83435	Call a coworker or friend;Google it
83437	Call a coworker or friend;Visit Stack Overflow...

	NEWSOSites	SOVisitFreq \
ResponseId		
6	Stack Overflow;Stack Exchange	Multiple times per day
7	Stack Overflow	Daily or almost daily
16	Stack Overflow;Stack Exchange	Multiple times per day
37	Stack Overflow;Stack Exchange	Daily or almost daily
38	Stack Overflow;Stack Exchange	Daily or almost daily
...	...	...
83428	Stack Overflow;Stack Exchange	Multiple times per day
83430	Stack Overflow;Stack Exchange	A few times per month or weekly
83431	Stack Overflow;Stack Exchange	A few times per week
83435	Stack Overflow;Stack Exchange	A few times per week
83437	Stack Overflow;Stack Exchange	A few times per week

	SOAccount \
ResponseId	
6	Yes
7	Yes
16	Yes
37	Yes
38	Yes
...	...
83428	Yes
83430	Not sure/can't remember
83431	No
83435	No
83437	Yes

	SOPartFreq \
ResponseId	
6	I have never participated in Q&A on Stack Over...
7	A few times per week
16	Less than once per month or monthly
37	A few times per week
38	Daily or almost daily
...	...
83428	A few times per month or weekly
83430	NaN
83431	NaN
83435	NaN
83437	I have never participated in Q&A on Stack Over...

	SOComm	NEWOtherComms	Age \
ResponseId			
6	Yes, somewhat	No	18-24 years old
7	Yes, somewhat	No	Prefer not to say
16	Neutral	No	Under 18 years old

37	Yes, somewhat	Yes	18-24 years old
38	Yes, definitely	No	35-44 years old
...	...	...	...
83428	Yes, somewhat	No	25-34 years old
83430	Yes, somewhat	No	25-34 years old
83431	No, not really	No	45-54 years old
83435	No, not at all	No	25-34 years old
83437	No, not really	No	25-34 years old

ResponseId		Gender	Trans	Sexuality \
6		Prefer not to say	No	Straight / Heterosexual
7		Prefer not to say	No	NaN
16		Man	No	Straight / Heterosexual
37		Man	No	Straight / Heterosexual
38		Man	No	Straight / Heterosexual
...		...	...	...
83428		Man	No	Straight / Heterosexual
83430	Man;Or, in your own words:	Yes		Queer
83431		Man	No	Straight / Heterosexual
83435		Man	No	Straight / Heterosexual
83437		Man	No	NaN

ResponseId		Ethnicity \
6		Prefer not to say
7		I don't know
16	White or of European descent	
37	White or of European descent	
38	White or of European descent	
...		...
83428	White or of European descent	
83430	White or of European descent	
83431	White or of European descent	
83435	White or of European descent	
83437	White or of European descent	

ResponseId		Accessibility \
6		None of the above
7		None of the above
16		None of the above
37		None of the above
38		None of the above
...		...
83428		None of the above
83430	I am unable to / find it difficult to walk or ...	



83431	None of the above
83435	None of the above
83437	None of the above

MentalHealth \

ResponseId

6	I have a concentration and/or memory disorder ...
7	None of the above
16	I have a concentration and/or memory disorder ...
37	Prefer not to say
38	I have a concentration and/or memory disorder ...
...	...
83428	I have an anxiety disorder;Or, in your own words:
83430	I have an anxiety disorder
83431	None of the above
83435	I have a concentration and/or memory disorder ...
83437	None of the above

SurveyLength

SurveyEase \

ResponseId

6	Too long	Neither easy nor difficult
7	Appropriate in length	Neither easy nor difficult
16	Too long	Easy
37	Too short	Easy
38	Appropriate in length	Easy
...	...	...
83428	Too short	Easy
83430	Appropriate in length	Neither easy nor difficult
83431	Appropriate in length	Easy
83435	Appropriate in length	Easy
83437	Appropriate in length	Neither easy nor difficult

ConvertedCompYearly

ResponseId

6	NaN
7	NaN
16	NaN
37	103000.0
38	300000.0
...	...
83428	4300000.0
83430	NaN
83431	125000.0
83435	160500.0
83437	90000.0

[15288 rows x 47 columns]

### 3.7.9 Para obter o número de pessoas que responderam às diferentes opções da questão Age1stCode para cada país

```
[116]: country_group["Age1stCode"].value_counts()
```

```
[116]: Country      Age1stCode
Afghanistan 18 - 24 years      19
           Younger than 5 years 13
           11 - 17 years      12
           5 - 10 years        7
           25 - 34 years        4
           ..
Zimbabwe   11 - 17 years        9
           25 - 34 years        5
           5 - 10 years        2
           35 - 44 years        1
           Older than 64 years   1
Name: Age1stCode, Length: 992, dtype: int64
```

### 3.7.10 Para obter o número de pessoas que moram na Índia que responderam às diferentes opções da questão Age1stCode

```
[117]: country_group["Age1stCode"].value_counts().loc["India"]
```

```
[117]: Age1stCode
11 - 17 years      4797
18 - 24 years      4279
5 - 10 years        695
25 - 34 years       490
Younger than 5 years 103
35 - 44 years       85
45 - 54 years       20
Older than 64 years   5
55 - 64 years        3
Name: Age1stCode, dtype: int64
```

### 3.7.11 Para obter a mediana da compensação total para cada país

```
[118]: country_group["CompTotal"].median()
```

```
[118]: Country
Afghanistan      63000.0
Albania          100000.0
Algeria          60000.0
```

```

Andorra                87000.0
Angola                 130000.0
...
Venezuela, Bolivarian Republic of... 1000.0
Viet Nam              18000000.0
Yemen                 300.0
Zambia                12000.0
Zimbabwe              600.0
Name: CompTotal, Length: 181, dtype: float64

```

### 3.7.12 Para obter a mediana e a média da compensação total para cada país

```
[119]: country_group["CompTotal"].agg(["median", "mean"])
```

```

[119]:
           median      mean
Country
Afghanistan    63000.0  5.845616e+05
Albania        100000.0  2.504897e+06
Algeria        60000.0  1.791122e+05
Andorra        87000.0  9.892500e+04
Angola         130000.0  3.387364e+05
...
Venezuela, Bolivarian Republic of... 1000.0  5.110863e+07
Viet Nam      18000000.0  5.330125e+07
Yemen         300.0  8.436429e+04
Zambia        12000.0  3.455264e+04
Zimbabwe      600.0  1.135846e+03

[181 rows x 2 columns]

```

### 3.7.13 Para obter a percentagem de pessoas que já trabalharam com Python para cada país

```
[120]: num_work_python = country_group["LanguageHaveWorkedWith"].apply(lambda x: x.str.
    ↳contains("Python").sum())
```

```
[121]: num_people_country = answers["Country"].value_counts()
```

```
[122]: python_df = pd.concat([num_work_python, num_people_country], axis="columns")
```

```
[123]: python_df["pct_work_python"] = (python_df["LanguageHaveWorkedWith"] /
    ↳python_df["Country"])*100
```

```
[124]: python_df
```

```
[124]:
```

	LanguageHaveWorkedWith	Country \
Afghanistan	20	65
Albania	30	73
Algeria	19	46
Andorra	4	12
Angola	5	27
...	...	...
Venezuela, Bolivarian Republic of...	43	104
Viet Nam	173	386
Yemen	6	20
Zambia	12	22
Zimbabwe	17	36

  

	pct_work_python
Afghanistan	30.769231
Albania	41.095890
Algeria	41.304348
Andorra	33.333333
Angola	18.518519
...	...
Venezuela, Bolivarian Republic of...	41.346154
Viet Nam	44.818653
Yemen	30.000000
Zambia	54.545455
Zimbabwe	47.222222

[181 rows x 3 columns]

## 3.8 Limpar dados

### 3.8.1 Para criar um novo DataFrame com dados em falta

```
[125]: people = {
    "first": ["Ana", "Bruno", "Hugo", "Pedro", np.nan, None, "NA"],
    "last": ["Fernandes", "Ramalho", "Pimentel", "Santos", np.nan, np.nan,
    ↪ "Missing"],
    "email": ["AnaFernandes@gmail.com", "BrunoRamalho@gmail.com",
    ↪ "HugoPimentel@gmail.com", None, np.nan, "Anonimo@gmail.com", "NA"],
    "age": [34, 67, 45, 45, None, None, "Missing"]
}
```

```
[126]: people_df = pd.DataFrame(people)
```

```
[127]: people_df
```

```
[127]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67
2	Hugo	Pimentel	HugoPimentel@gmail.com	45
3	Pedro	Santos	None	45
4	NaN	NaN	NaN	None
5	None	NaN	Anonimo@gmail.com	None
6	NA	Missing	NA	Missing

### 3.8.2 Para eliminar as linhas que tenham um ou mais campos com *NaN* ou *None*

```
[128]: people_df.dropna()
```

```
[128]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67
2	Hugo	Pimentel	HugoPimentel@gmail.com	45
6	NA	Missing	NA	Missing

### 3.8.3 Para eliminar as linhas que tenham todos os campos com *NaN* ou *None*

```
[129]: people_df.dropna(how = "all")
```

```
[129]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67
2	Hugo	Pimentel	HugoPimentel@gmail.com	45
3	Pedro	Santos	None	45
5	None	NaN	Anonimo@gmail.com	None
6	NA	Missing	NA	Missing

### 3.8.4 Para eliminar as colunas que tenham *NaN* ou *None*

```
[130]: people_df.dropna(axis = "columns")
```

```
[130]: Empty DataFrame
Columns: []
Index: [0, 1, 2, 3, 4, 5, 6]
```

### 3.8.5 Para eliminar as linhas cujo email seja *NaN* ou *None*

```
[131]: people_df.dropna(subset=["email"])
```

```
[131]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67
2	Hugo	Pimentel	HugoPimentel@gmail.com	45
5	None	NaN	Anonimo@gmail.com	None
6	NA	Missing	NA	Missing

### 3.8.6 Para eliminar as linhas cujo último nome ou email sejam *NaN* ou *None*

```
[132]: people_df.dropna(subset=["last", "email"])
```

```
[132]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67
2	Hugo	Pimentel	HugoPimentel@gmail.com	45
6	NA	Missing	NA	Missing

### 3.8.7 Para substituir *NA* por *NaN*

```
[133]: people_df.replace("NA", np.nan, inplace=True)
```

```
[134]: people_df
```

```
[134]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67
2	Hugo	Pimentel	HugoPimentel@gmail.com	45
3	Pedro	Santos	None	45
4	NaN	NaN	NaN	None
5	None	NaN	Anonimo@gmail.com	None
6	NaN	Missing	NaN	Missing

### 3.8.8 Para substituir *Missing* por *NaN*

```
[135]: people_df.replace("Missing", np.nan, inplace=True)
```

```
[136]: people_df
```

```
[136]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34.0
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67.0
2	Hugo	Pimentel	HugoPimentel@gmail.com	45.0
3	Pedro	Santos	None	45.0
4	NaN	NaN	NaN	NaN
5	None	NaN	Anonimo@gmail.com	NaN
6	NaN	NaN	NaN	NaN

### 3.8.9 Para visualizar quais são os campos com valores em falta

```
[137]: people_df.isna()
```

```
[137]:
```

	first	last	email	age
0	False	False	False	False
1	False	False	False	False
2	False	False	False	False
3	False	False	True	False
4	True	True	True	True
5	True	True	False	True
6	True	True	True	True

### 3.8.10 Para preencher todos os valores em falta com *MISSING*

```
[138]: people_df.fillna("MISSING")
```

```
[138]:
```

	first	last	email	age
0	Ana	Fernandes	AnaFernandes@gmail.com	34.0
1	Bruno	Ramalho	BrunoRamalho@gmail.com	67.0
2	Hugo	Pimentel	HugoPimentel@gmail.com	45.0
3	Pedro	Santos	MISSING	45.0
4	MISSING	MISSING	MISSING	MISSING
5	MISSING	MISSING	Anonimo@gmail.com	MISSING
6	MISSING	MISSING	MISSING	MISSING

### 3.8.11 Para calcular a média de idades sem os valores em falta

```
[139]: people_df["age"].mean()
```

```
[139]: 47.75
```

### 3.8.12 Para visualizar os valores únicos da coluna idade

```
[140]: people_df["age"].unique()
```

```
[140]: array([34., 67., 45., nan])
```

### 3.8.13 Para reconhecer *NA* e *Missing* como valores em falta aquando da leitura do CSV com as respostas

```
[141]: na_vals = ["NA", "Missing"]

answers = pd.read_csv("stack-overflow-developer-survey-2021/
↳survey_results_public.csv", index_col = "ResponseId", na_values = na_vals)
```

## 3.9 Ler/escrever dados

### 3.9.1 Para obter um DataFrame com as respostas cujo país é Portugal

```
[142]: portugal_df = answers[answers["Country"] == "Portugal"]
```

### 3.9.2 Para escrever o DataFrame num CSV

```
[143]: portugal_df.to_csv("stack-overflow-developer-survey-2021/
↳survey_results_portugal.csv")
```

### 3.9.3 Para escrever o DataFrame num TSV

```
[144]: portugal_df.to_csv("stack-overflow-developer-survey-2021/
↳survey_results_portugal.tsv", sep = "\t")
```

### 3.9.4 Para escrever o DataFrame num Excel

```
[145]: portugal_df.to_excel("stack-overflow-developer-survey-2021/
↳survey_results_portugal.xlsx")
```



### 3.9.5 Para ler o Excel

```
[146]: result = pd.read_excel("stack-overflow-developer-survey-2021/
↳survey_results_portugal.xlsx", index_col = "ResponseId")
```

```
[147]: result
```

```
[147]:
```

		MainBranch \
ResponseId		
41		I am a developer by profession
257	I am not primarily a developer, but I write co...	
427		I code primarily as a hobby
439		I am a developer by profession
455		I am a developer by profession
...		...
82962		I am a developer by profession
83140		I am a developer by profession
83259	I am a student who is learning to code	
83312	I am not primarily a developer, but I write co...	
83333		I am a developer by profession

	Employment	Country	US_State	UK_Country \
ResponseId				
41	Employed full-time	Portugal	NaN	NaN
257	Employed full-time	Portugal	NaN	NaN
427	Student, full-time	Portugal	NaN	NaN
439	Employed full-time	Portugal	NaN	NaN
455	Employed full-time	Portugal	NaN	NaN
...	...	...	...	...
82962	Employed full-time	Portugal	NaN	NaN
83140	Employed full-time	Portugal	NaN	NaN
83259	Student, full-time	Portugal	NaN	NaN
83312	Employed full-time	Portugal	NaN	NaN
83333	Employed full-time	Portugal	NaN	NaN

		EdLevel	Age1stCode \
ResponseId			
41	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	18 - 24 years	
257	Some college/university study without earning ...	11 - 17 years	
427	Some college/university study without earning ...	11 - 17 years	
439	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	18 - 24 years	
455	Secondary school (e.g. American high school, G...	11 - 17 years	
...		...	...
82962	Master's degree (M.A., M.S., M.Eng., MBA, etc.)	18 - 24 years	
83140	Some college/university study without earning ...	11 - 17 years	
83259	Secondary school (e.g. American high school, G...	11 - 17 years	
83312	Bachelor's degree (B.A., B.S., B.Eng., etc.)	11 - 17 years	

83333      Some college/university study without earning ... 11 - 17 years

ResponseId	LearnCode \
41	School
257	Other online resources (ex: videos, blogs, etc...
427	Online Forum
439	Other online resources (ex: videos, blogs, etc...
455	Other online resources (ex: videos, blogs, etc...
...	...
82962	School
83140	Other online resources (ex: videos, blogs, etc)
83259	Other online resources (ex: videos, blogs, etc...
83312	Books / Physical media
83333	Coding Bootcamp;School

ResponseId	YearsCode	YearsCodePro \
41	Less than 1 year	5
257	9	3
427	5	NaN
439	8	7
455	5	2
...	...	...
82962	9	2
83140	2	2
83259	1	NaN
83312	33	30
83333	8	5

ResponseId	DevType \
41	Developer, full-stack
257	Developer, front-end;Developer, desktop or ent...
427	NaN
439	Developer, back-end
455	Developer, mobile;Developer, full-stack
...	...
82962	Developer, full-stack
83140	Developer, back-end
83259	NaN
83312	Educator
83333	Developer, front-end;Developer, desktop or ent...

ResponseId	OrgSize	Currency	CompTotal	CompFreq \
41	20 to 99 employees	EUR European Euro	NaN	Monthly

257	1,000 to 4,999 employees	EUR	European	Euro	700.0	Monthly
427	NaN			NaN	NaN	NaN
439	20 to 99 employees	EUR	European	Euro	2650.0	Monthly
455	20 to 99 employees	EUR	European	Euro	NaN	NaN
...	...			...	...	...
82962	20 to 99 employees	EUR	European	Euro	1321.0	Monthly
83140	100 to 499 employees	EUR	European	Euro	NaN	Monthly
83259	NaN			NaN	NaN	NaN
83312	20 to 99 employees	EUR	European	Euro	800.0	Monthly
83333	100 to 499 employees	EUR	European	Euro	43000.0	Yearly

	LanguageHaveWorkedWith \
ResponseId	
41	C;C++;Java;Kotlin;Python
257	C#;HTML/CSS;Java;SQL;VBA
427	C;Matlab;Python;Rust;SQL
439	Java;JavaScript;Python;SQL
455	C#;JavaScript;Node.js;TypeScript
...	...
82962	Java;JavaScript;SQL
83140	C#;Java;Python
83259	Assembly;C;Java;Python
83312	PHP
83333	HTML/CSS;JavaScript;Node.js;TypeScript

	LanguageWantToWorkWith \
ResponseId	
41	Dart;Kotlin;Python;Swift
257	C#;HTML/CSS;Java;SQL;VBA
427	Rust
439	Java;Kotlin;SQL
455	C#;JavaScript;Node.js;TypeScript
...	...
82962	Node.js
83140	Java;Python
83259	C++;Java;JavaScript;Python
83312	PHP
83333	HTML/CSS;JavaScript;Node.js;TypeScript

	DatabaseHaveWorkedWith \
ResponseId	
41	MongoDB;MySQL;Oracle;PostgreSQL
257	Microsoft SQL Server;MySQL
427	PostgreSQL
439	Elasticsearch;MySQL
455	Firebase;Microsoft SQL Server;MongoDB;SQLite
...	...

82962	MariaDB;Microsoft SQL Server;MongoDB;MySQL;Ora...
83140	IBM DB2;Microsoft SQL Server;MySQL;Oracle
83259	NaN
83312	MariaDB
83333	PostgreSQL

DatabaseWantToWorkWith PlatformHaveWorkedWith \

ResponseId

41	MongoDB;PostgreSQL	NaN
257	Microsoft SQL Server;MySQL	Microsoft Azure
427	NaN	NaN
439	Elasticsearch;MySQL;Redis	AWS
455	Microsoft SQL Server;MongoDB;SQLite	Heroku
...	...	...
82962	Elasticsearch	Heroku
83140	NaN	IBM Cloud or Watson
83259	NaN	NaN
83312	MariaDB	NaN
83333	PostgreSQL	NaN

PlatformWantToWorkWith \

ResponseId

41	NaN
257	Microsoft Azure
427	NaN
439	AWS;Google Cloud Platform
455	NaN
...	...
82962	NaN
83140	NaN
83259	NaN
83312	NaN
83333	NaN

WebframeHaveWorkedWith \

ResponseId

41	NaN
257	ASP.NET;ASP.NET Core
427	NaN
439	Spring
455	React.js
...	...
82962	jQuery;Spring
83140	NaN
83259	NaN
83312	ASP.NET
83333	Angular.js;Express;Gatsby;React.js;Vue.js

	WebframeWantToWorkWith	MiscTechHaveWorkedWith \
ResponseId		
41	NaN	Flutter;NumPy
257	ASP.NET;ASP.NET Core	.NET Framework;.NET Core / .NET 5
427	NaN	NaN
439	Spring	NumPy
455	ASP.NET;ASP.NET Core ;React.js	.NET Framework;.NET Core / .NET 5
...	...	...
82962	Express;React.js;Vue.js	NaN
83140	NaN	.NET Framework
83259	NaN	NaN
83312	Laravel	.NET Framework
83333	Gatsby;React.js;Vue.js	React Native

	MiscTechWantToWorkWith	ToolsTechHaveWorkedWith \
ResponseId		
41	NaN	Git;Unity 3D
257	.NET Framework;.NET Core / .NET 5	NaN
427	NaN	Git
439	NaN	Docker;Git
455	.NET Framework;.NET Core / .NET 5	Xamarin
...	...	...
82962	NaN	Docker;Git
83140	Qt;TensorFlow;Torch/PyTorch	NaN
83259	NaN	NaN
83312	Flutter	NaN
83333	React Native	Docker;Git;Yarn

	ToolsTechWantToWorkWith \
ResponseId	
41	Git
257	NaN
427	Git
439	Docker;Git;Kubernetes
455	Xamarin
...	...
82962	Ansible;Kubernetes
83140	NaN
83259	NaN
83312	NaN
83333	Deno;Docker;Git;Kubernetes;Yarn

	NEWCollabToolsHaveWorkedWith \
ResponseId	
41	Android Studio;IntelliJ;Sublime Text;Visual St...
257	Notepad++;Visual Studio

427	Visual Studio Code
439	IntelliJ;Sublime Text
455	Visual Studio;Visual Studio Code
...	...
82962	IntelliJ;Vim;Visual Studio Code
83140	Eclipse;Notepad++;Visual Studio
83259	Eclipse;IntelliJ;Visual Studio Code
83312	Notepad++;Visual Studio
83333	Webstorm

	NEWCollabToolsWantToWorkWith	OpSys \
ResponseId		
41	Android Studio;IntelliJ;Sublime Text;Visual St...	MacOS
257	Notepad++;Visual Studio	Windows
427	Visual Studio Code	Linux-based
439	IntelliJ;Sublime Text	MacOS
455	Visual Studio;Visual Studio Code	Windows
...	...	...
82962	NaN	Linux-based
83140	Android Studio;Eclipse;Notepad++;Visual Studio	Windows
83259	IntelliJ	Windows
83312	Visual Studio Code	Windows
83333	Webstorm	MacOS

	NEWStuck \
ResponseId	
41	Call a coworker or friend;Visit Stack Overflow...
257	Visit Stack Overflow;Google it;Watch help / tu...
427	Visit Stack Overflow;Google it;Do other work a...
439	Call a coworker or friend;Visit Stack Overflow...
455	Visit Stack Overflow;Google it;Watch help / tu...
...	...
82962	Call a coworker or friend;Visit Stack Overflow...
83140	Call a coworker or friend;Google it;Do other w...
83259	Visit Stack Overflow;Google it;Watch help / tu...
83312	Visit Stack Overflow;Go for a walk or other ph...
83333	Go for a walk or other physical activity;Googl...

	NEWSOSites \
ResponseId	
41	Stack Overflow;Stack Exchange
257	Stack Overflow;Stack Exchange
427	Stack Overflow;Stack Exchange
439	Stack Overflow;Stack Exchange
455	Stack Overflow
...	...
82962	Stack Overflow

83140	Stack Overflow
83259	Stack Overflow
83312	Stack Overflow
83333	Stack Overflow

	SOVisitFreq	SOAccount	\
ResponseId			
41	Daily or almost daily	No	
257	Multiple times per day	Yes	
427	Multiple times per day	Yes	
439	Multiple times per day	Yes	
455	Daily or almost daily	Yes	
...	...	...	
82962	Daily or almost daily	Yes	
83140	A few times per month or weekly	Yes	
83259	Less than once per month or monthly	No	
83312	Multiple times per day	Yes	
83333	A few times per week	Yes	

	SOPartFreq	\
ResponseId		
41	NaN	
257	A few times per month or weekly	
427	A few times per month or weekly	
439	I have never participated in Q&A on Stack Over...	
455	I have never participated in Q&A on Stack Over...	
...	...	
82962	I have never participated in Q&A on Stack Over...	
83140	Less than once per month or monthly	
83259	NaN	
83312	I have never participated in Q&A on Stack Over...	
83333	Less than once per month or monthly	

	SOComm	NEWOtherComms	Age	Gender	Trans	\
ResponseId						
41	Neutral	No	25-34 years old	Man	No	
257	Yes, somewhat	No	25-34 years old	Man	No	
427	Neutral	No	18-24 years old	Man	No	
439	No, not really	No	25-34 years old	Man	No	
455	Neutral	Yes	18-24 years old	Man	No	
...	...	...	...	...	...	
82962	No, not really	No	25-34 years old	Man	No	
83140	Neutral	No	25-34 years old	Man	No	
83259	No, not at all	No	18-24 years old	Man	No	
83312	Yes, definitely	No	45-54 years old	Man	No	
83333	No, not really	No	35-44 years old	Man	No	

ResponseId	Sexuality	Ethnicity \
41	NaN	NaN
257	Straight / Heterosexual	White or of European descent
427	Straight / Heterosexual	White or of European descent
439	Straight / Heterosexual	White or of European descent
455	Straight / Heterosexual	White or of European descent
...	...	...
82962	Straight / Heterosexual	White or of European descent
83140	Straight / Heterosexual	White or of European descent
83259	Straight / Heterosexual	White or of European descent
83312	Straight / Heterosexual	White or of European descent
83333	Straight / Heterosexual	White or of European descent

ResponseId	Accessibility	MentalHealth \
41	NaN	NaN
257	None of the above	None of the above
427	None of the above	None of the above
439	None of the above	None of the above
455	I am blind / have difficulty seeing	None of the above
...	...	...
82962	None of the above	None of the above
83140	None of the above	None of the above
83259	None of the above	NaN
83312	None of the above	None of the above
83333	None of the above	None of the above

ResponseId	SurveyLength	SurveyEase	ConvertedCompYearly
41	Appropriate in length	Easy	NaN
257	Appropriate in length	Easy	9084.0
427	Appropriate in length	Easy	NaN
439	Appropriate in length	Easy	34380.0
455	Appropriate in length	Easy	NaN
...	...	...	...
82962	Appropriate in length	Easy	17136.0
83140	Appropriate in length	Easy	NaN
83259	Appropriate in length	Easy	NaN
83312	Too long	Easy	10380.0
83333	Appropriate in length	Easy	46482.0

[530 rows x 47 columns]