

Pandas_practice3

March 21, 2021

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

```
[194]: df= pd.read_csv('D:\Data Science\sheets\survey_results_public.  
→csv',index_col='Respondent')
```

```
[195]: df.head(5)
```

```
[195]:
```

		MainBranch	Hobbyist	\
Respondent				
1	I am a student who is learning to code	Yes		
2	I am a student who is learning to code	No		
3	I am not primarily a developer, but I write co...	Yes		
4	I am a developer by profession	No		
5	I am a developer by profession	Yes		

		OpenSourcer	\
Respondent			
1		Never	
2	Less than once per year		
3		Never	
4		Never	
5	Once a month or more often		

		OpenSource	\
Respondent			
1	The quality of OSS and closed source software ...		
2	The quality of OSS and closed source software ...		
3	The quality of OSS and closed source software ...		
4	The quality of OSS and closed source software ...		
5	OSS is, on average, of HIGHER quality than pro...		

		Employment	Country	\
Respondent				
1	Not employed, and not looking for work		United Kingdom	
2	Not employed, but looking for work		Bosnia and Herzegovina	
3	Employed full-time		Thailand	
4	Employed full-time		United States	
5	Employed full-time		Ukraine	

Respondent	Student	EdLevel \
1	No	Primary/elementary school
2	Yes, full-time	Secondary school (e.g. American high school, G...
3	No	Bachelor's degree (BA, BS, B.Eng., etc.)
4	No	Bachelor's degree (BA, BS, B.Eng., etc.)
5	No	Bachelor's degree (BA, BS, B.Eng., etc.)

Respondent	UndergradMajor \
1	NaN
2	NaN
3	Web development or web design
4	Computer science, computer engineering, or sof...
5	Computer science, computer engineering, or sof...

Respondent	EduOther \
1	Taught yourself a new language, framework, or ...
2	Taken an online course in programming or softw...
3	Taught yourself a new language, framework, or ...
4	Taken an online course in programming or softw...
5	Taken an online course in programming or softw...

Respondent	OrgSize \
1	NaN
2	NaN
3	100 to 499 employees
4	100 to 499 employees
5	10,000 or more employees

Respondent	DevType	YearsCode \
1	NaN	4
2	Developer, desktop or enterprise applications;...	NaN
3	Designer;Developer, back-end;Developer, front-...	3
4	Developer, full-stack	3
5	Academic researcher;Developer, desktop or ente...	16

Respondent	Age1stCode	YearsCodePro	CareerSat \
1	10	NaN	NaN
2	17	NaN	NaN
3	22	1	Slightly satisfied
4	16	Less than 1 year	Very satisfied

5 14 9 Very dissatisfied

Respondent	JobSat	MgrIdiot	MgrMoney	MgrWant	\
1	NaN	NaN	NaN	NaN	
2	NaN	NaN	NaN	NaN	
3	Slightly satisfied	Not at all confident	Not sure	Not sure	
4	Slightly satisfied	Very confident	No	Not sure	
5	Slightly dissatisfied	Somewhat confident	Yes	No	

Respondent	JobSeek	\
1		NaN
2	I am actively looking for a job	
3	I'm not actively looking, but I am open to new...	
4	I am not interested in new job opportunities	
5	I am not interested in new job opportunities	

Respondent	LastHireDate \
1	NaN
2	I've never had a job
3	1-2 years ago
4	Less than a year ago
5	Less than a year ago

Respondent	LastInt	FizzBuzz	\
1	NaN	NaN	
2	NaN	NaN	
3	Interview with people in peer roles		No
4	Write code by hand (e.g., on a whiteboard);Int...		No
5	Write any code;Write code by hand (e.g., on a ...		No

Respondent	JobFactors
1	NaN
2	Financial performance or funding status of the...
3	Languages, frameworks, and other technologies ...
4	Languages, frameworks, and other technologies ...
5	Industry that I'd be working in;Languages, fra...

Respondent	ResumeUpdate	CurrencySymbol	\
1	NaN	NaN	
2	Something else changed (education, award, medi...	NaN	
3	I was preparing for a job search	THB	

4	I was preparing for a job search	USD
5	I was preparing for a job search	UAH

	CurrencyDesc	CompTotal	CompFreq	ConvertedComp \
Respondent				
1	NaN	NaN	NaN	NaN
2	NaN	NaN	NaN	NaN
3	Thai baht	23000.0	Monthly	8820.0
4	United States dollar	61000.0	Yearly	61000.0
5	Ukrainian hryvnia	NaN	NaN	NaN

	WorkWeekHrs	WorkPlan \
Respondent		
1	NaN	NaN
2	NaN	NaN
3	40.0	There's no schedule or spec; I work on what se...
4	80.0	There's no schedule or spec; I work on what se...
5	55.0	There is a schedule and/or spec (made by me or...

	WorkChallenge \
Respondent	
1	NaN
2	NaN
3	Distracting work environment;Inadequate access...
4	NaN
5	Being tasked with non-development work;Inadequ...

	WorkRemote	WorkLoc	ImpSyn \
Respondent			
1	NaN	NaN	NaN
2	NaN	NaN	NaN
3	Less than once per month / Never	Home	Average
4	Less than once per month / Never	Home	A little below average
5	A few days each month	Office	A little above average

	CodeRev	CodeRevHrs \
Respondent		
1	NaN	NaN
2	NaN	NaN
3	No	NaN
4	No	NaN
5	Yes, because I see value in code review	NaN

	UnitTests \
Respondent	
1	NaN
2	NaN

3 No, but I think we should
 4 No, but I think we should
 5 Yes, it's part of our process

PurchaseHow \

Respondent

1 NaN
 2 NaN
 3 Not sure
 4 Developers typically have the most influence o...
 5 Not sure

PurchaseWhat \

Respondent

1 NaN
 2 NaN
 3 I have little or no influence
 4 I have little or no influence
 5 I have little or no influence

LanguageWorkedWith \

Respondent

1 HTML/CSS;Java;JavaScript;Python
 2 C++;HTML/CSS;Python
 3 HTML/CSS
 4 C;C++;C#;Python;SQL
 5 C++;HTML/CSS;Java;JavaScript;Python;SQL;VBA

LanguageDesireNextYear \

Respondent

1 C;C++;C#;Go;HTML/CSS;Java;JavaScript;Python;SQL
 2 C++;HTML/CSS;JavaScript;SQL
 3 Elixir;HTML/CSS
 4 C;C#;JavaScript;SQL
 5 HTML/CSS;Java;JavaScript;SQL;WebAssembly

DatabaseWorkedWith \

Respondent

1 SQLite
 2 NaN
 3 PostgreSQL
 4 MySQL;SQLite
 5 Couchbase;MongoDB;MySQL;Oracle;PostgreSQL;SQLite

DatabaseDesireNextYear \

Respondent

1 MySQL

2		MySQL
3		PostgreSQL
4		MySQL;SQLite
5	Couchbase;Firebase;MongoDB;MySQL;Oracle;Postgr...	

	PlatformWorkedWith \
Respondent	
1	MacOS;Windows
2	Windows
3	NaN
4	Linux;Windows
5	Android;Linux;MacOS;Slack;Windows

	PlatformDesireNextYear \
Respondent	
1	Android;Arduino;Windows
2	Windows
3	NaN
4	Linux;Windows
5	Android;Docker;Kubernetes;Linux;Slack

	WebFrameWorkedWith \
Respondent	
1	Django;Flask
2	Django
3	NaN
4	NaN
5	Django;Express;Flask;jQuery;React.js;Spring

	WebFrameDesireNextYear	MiscTechWorkedWith \
Respondent		
1	Flask;jQuery	Node.js
2	Django	NaN
3	Other(s):	NaN
4	NaN	.NET
5	Flask;jQuery;React.js;Spring	Cordova;Node.js

	MiscTechDesireNextYear \
Respondent	
1	Node.js
2	NaN
3	NaN
4	.NET
5	Apache Spark;Hadoop;Node.js;React Native

	DevEnviron	OpSys \
Respondent		

1	IntelliJ;Notepad++;PyCharm	Windows
2	Atom;PyCharm	Windows
3	Vim;Visual Studio Code	Linux-based
4	Eclipse;Vim;Visual Studio;Visual Studio Code	Windows
5	IntelliJ;Notepad++;Vim	Linux-based

Containers BlockchainOrg \

Respondent

1	I do not use containers	NaN
2	I do not use containers	NaN
3	I do not use containers	NaN
4	I do not use containers	Not at all
5	Outside of work, for personal projects	Not at all

BlockchainIs BetterLife \

Respondent

1		NaN	Yes
2	Useful across many domains and could change ma...		Yes
3		NaN	Yes
4	Useful for decentralized currency (i.e., Bitcoin)		Yes
5		NaN	Yes

ITperson OffOn SocialMedia \

Respondent

1	Fortunately, someone else has that title	Yes	Twitter
2		Yes	Instagram
3		Yes	Reddit
4	SIGH	Yes	Reddit
5	Also Yes	Yes	Facebook

Extraversion ScreenName SOVisit1st \

Respondent

1	Online	Username	2017
2	Online	Username	2017
3	In real life (in person)	Username	2011
4	In real life (in person)	Username	2014
5	In real life (in person)	Username	I don't remember

SOVisitFreq \

Respondent

1	A few times per month or weekly
2	Daily or almost daily
3	A few times per week
4	Daily or almost daily
5	Multiple times per day

SOVisitTo \

Respondent

1	Find answers to specific questions;Learn how t...
2	Find answers to specific questions;Learn how t...
3	Find answers to specific questions;Learn how t...
4	Find answers to specific questions;Pass the ti...
5	Find answers to specific questions

SOFindAnswer

SOTimeSaved \

Respondent

1	3-5 times per week	Stack Overflow was much faster
2	3-5 times per week	Stack Overflow was much faster
3	6-10 times per week	They were about the same
4	1-2 times per week	Stack Overflow was much faster
5	More than 10 times per week	Stack Overflow was much faster

SOHowMuchTime SOAccount

SOPartFreq \

Respondent

1	31-60 minutes	No	NaN
2	11-30 minutes	Yes	A few times per month or weekly
3	NaN	Yes	Less than once per month or monthly
4	31-60 minutes	Yes	Less than once per month or monthly
5	NaN	Yes	A few times per month or weekly

SOJobs \

Respondent

1	No, I didn't know that Stack Overflow had a jo...
2	No, I knew that Stack Overflow had a job board...
3	Yes
4	Yes
5	No, I knew that Stack Overflow had a job board...

EntTeams \

Respondent

1	No, and I don't know what those are
2	No, and I don't know what those are
3	No, I've heard of them, but I am not part of a...
4	No, and I don't know what those are
5	No, I've heard of them, but I am not part of a...

SOComm

WelcomeChange \

Respondent

1	Neutral	Just as welcome now as I felt last year
2	Yes, somewhat	Just as welcome now as I felt last year
3	Neutral	Just as welcome now as I felt last year
4	No, not really	Just as welcome now as I felt last year
5	Yes, definitely	Just as welcome now as I felt last year

Respondent		SONewContent	Age	Gender	\
1	Tech articles written by other developers;Indu...	14.0		Man	
2	Tech articles written by other developers;Indu...	19.0		Man	
3	Tech meetups or events in your area;Courses on...	28.0		Man	
4	Tech articles written by other developers;Indu...	22.0		Man	
5	Tech meetups or events in your area;Courses on...	30.0		Man	

Respondent	Trans	Sexuality	\
1	No	Straight / Heterosexual	
2	No	Straight / Heterosexual	
3	No	Straight / Heterosexual	
4	No	Straight / Heterosexual	
5	No	Straight / Heterosexual	

Respondent		Ethnicity	Dependents	\
1		NaN	No	
2		NaN	No	
3		NaN	Yes	
4		White or of European descent	No	
5		White or of European descent;Multiracial	No	

Respondent	SurveyLength	SurveyEase
1	Appropriate in length	Neither easy nor difficult
2	Appropriate in length	Neither easy nor difficult
3	Appropriate in length	Neither easy nor difficult
4	Appropriate in length	Easy
5	Appropriate in length	Easy

```
[196]: df.shape
```

```
[196]: (88883, 84)
```

```
[197]: df.columns
```

```
[197]: Index(['MainBranch', 'Hobbyist', 'OpenSourcer', 'OpenSource', 'Employment',
        'Country', 'Student', 'EdLevel', 'UndergradMajor', 'EduOther',
        'OrgSize', 'DevType', 'YearsCode', 'Age1stCode', 'YearsCodePro',
        'CareerSat', 'JobSat', 'MgrIdiot', 'MgrMoney', 'MgrWant', 'JobSeek',
        'LastHireDate', 'LastInt', 'FizzBuzz', 'JobFactors', 'ResumeUpdate',
        'CurrencySymbol', 'CurrencyDesc', 'CompTotal', 'CompFreq',
        'ConvertedComp', 'WorkWeekHrs', 'WorkPlan', 'WorkChallenge',
        'WorkRemote', 'WorkLoc', 'ImpSyn', 'CodeRev', 'CodeRevHrs', 'UnitTests',
        'PurchaseHow', 'PurchaseWhat', 'LanguageWorkedWith',
```

```
'LanguageDesireNextYear', 'DatabaseWorkedWith',
'DatabaseDesireNextYear', 'PlatformWorkedWith',
'PlatformDesireNextYear', 'WebFrameWorkedWith',
'WebFrameDesireNextYear', 'MiscTechWorkedWith',
'MiscTechDesireNextYear', 'DevEnviron', 'OpSys', 'Containers',
'BlockchainOrg', 'BlockchainIs', 'BetterLife', 'ITperson', 'OffOn',
'SocialMedia', 'Extraversion', 'ScreenName', 'SOVisit1st',
'SOVisitFreq', 'SOVisitTo', 'SOFindAnswer', 'SOTimeSaved',
'SOHowMuchTime', 'SOAccount', 'SOPartFreq', 'SOJobs', 'EntTeams',
'SOComm', 'WelcomeChange', 'SONewContent', 'Age', 'Gender', 'Trans',
'Sexuality', 'Ethnicity', 'Dependents', 'SurveyLength', 'SurveyEase'],
dtype='object')
```

```
[198]: pd.set_option('display.max_columns',85)
pd.set_option('display.max_rows',85)
```

```
[199]: schema_df = pd.read_csv('D:\Data Science\sheets\survey_results_schema.
→csv',index_col='Column')
schema_df
```

```
[199]:
```

Column	QuestionText
Respondent	Randomized respondent ID number (not in order ...
MainBranch	Which of the following options best describes ...
Hobbyist	Do you code as a hobby?
OpenSourcer	How often do you contribute to open source?
OpenSource	How do you feel about the quality of open sour...
Employment	Which of the following best describes your cur...
Country	In which country do you currently reside?
Student	Are you currently enrolled in a formal, degree...
EdLevel	Which of the following best describes the high...
UndergradMajor	What was your main or most important field of ...
EduOther	Which of the following types of non-degree edu...
OrgSize	Approximately how many people are employed by ...
DevType	Which of the following describe you? Please se...
YearsCode	Including any education, how many years have y...
Age1stCode	At what age did you write your first line of c...
YearsCodePro	How many years have you coded professionally (...)
CareerSat	Overall, how satisfied are you with your caree...
JobSat	How satisfied are you with your current job? (...)
MgrIdiot	How confident are you that your manager knows ...
MgrMoney	Do you believe that you need to be a manager t...
MgrWant	Do you want to become a manager yourself in th...
JobSeek	Which of the following best describes your cur...
LastHireDate	When was the last time that you took a job wit...
LastInt	In your most recent successful job interview (...)
FizzBuzz	Have you ever been asked to solve FizzBuzz in ...

JobFactors	Imagine that you are deciding between two job ...
ResumeUpdate	Think back to the last time you updated your r...
CurrencySymbol	Which currency do you use day-to-day? If your ...
CurrencyDesc	Which currency do you use day-to-day? If your ...
CompTotal	What is your current total compensation (salar...
CompFreq	Is that compensation weekly, monthly, or yearly?
ConvertedComp	Salary converted to annual USD salaries using ...
WorkWeekHrs	On average, how many hours per week do you work?
WorkPlan	How structured or planned is your work?
WorkChallenge	Of these options, what are your greatest chall...
WorkRemote	How often do you work remotely?
WorkLoc	Where would you prefer to work?
ImpSyn	For the specific work you do, and the years of...
CodeRev	Do you review code as part of your work?
CodeRevHrs	On average, how many hours per week do you spe...
UnitTests	Does your company regularly employ unit tests ...
PurchaseHow	How does your company make decisions about pur...
PurchaseWhat	What level of influence do you, personally, ha...
LanguageWorkedWith	Which of the following programming, scripting,...
LanguageDesireNextYear	Which of the following programming, scripting,...
DatabaseWorkedWith	Which of the following database environments h...
DatabaseDesireNextYear	Which of the following database environments h...
PlatformWorkedWith	Which of the following platforms have you done...
PlatformDesireNextYear	Which of the following platforms have you done...
WebFrameWorkedWith	Which of the following web frameworks have you...
WebFrameDesireNextYear	Which of the following web frameworks have you...
MiscTechWorkedWith	Which of the following other frameworks, libra...
MiscTechDesireNextYear	Which of the following other frameworks, libra...
DevEnviron	Which development environment(s) do you use re...
OpSys	What is the primary operating system in which ...
Containers	How do you use containers (Docker, Open Contai...
BlockchainOrg	How is your organization thinking about or imp...
BlockchainIs	Blockchain / cryptocurrency technology is prim...
BetterLife	Do you think people born today will have a bet...
ITperson	Are you the "IT support person" for your family?
OffOn	Have you tried turning it off and on again?
SocialMedia	What social media site do you use the most?
Extraversion	Do you prefer online chat or IRL conversations?
ScreenName	What do you call it?
SOVisit1st	To the best of your memory, when did you first...
SOVisitFreq	How frequently would you say you visit Stack O...
SOVisitTo	I visit Stack Overflow to... (check all that a...
SOFindAnswer	On average, how many times a week do you find ...
SOTimeSaved	Think back to the last time you solved a codin...
SOHowMuchTime	About how much time did you save? If you're no...
SOAccount	Do you have a Stack Overflow account?
SOPartFreq	How frequently would you say you participate i...

SOJobs	Have you ever used or visited Stack Overflow J...
EntTeams	Have you ever used Stack Overflow for Enterpri...
SOComm	Do you consider yourself a member of the Stack...
WelcomeChange	Compared to last year, how welcome do you feel...
SONewContent	Would you like to see any of the following on ...
Age	What is your age (in years)? If you prefer not...
Gender	Which of the following do you currently identi...
Trans	Do you identify as transgender?
Sexuality	Which of the following do you currently identi...
Ethnicity	Which of the following do you identify as? Ple...
Dependents	Do you have any dependents (e.g., children, el...
SurveyLength	How do you feel about the length of the survey...
SurveyEase	How easy or difficult was this survey to compl...

```
[200]: df.sort_index(inplace=True)
```

```
[201]: df['Hobbyist']
```

```
[201]: Respondent
1      Yes
2      No
3      Yes
4      No
5      Yes
...
88879  Yes
88880  Yes
88881  Yes
88882  Yes
88883  Yes
Name: Hobbyist, Length: 88883, dtype: object
```

```
[202]: df.loc[0:3, 'Hobbyist':'Employment']
```

```
[202]:
```

	Hobbyist	OpenSourcer \
Respondent		
1	Yes	Never
2	No	Less than once per year
3	Yes	Never

	OpenSource \
Respondent	
1	The quality of OSS and closed source software ...
2	The quality of OSS and closed source software ...
3	The quality of OSS and closed source software ...

Employment

```

Respondent
1          Not employed, and not looking for work
2          Not employed, but looking for work
3          Employed full-time

```

```
[203]: df['Hobbyist'].value_counts()
```

```

[203]: Yes      71257
      No       17626
      Name: Hobbyist, dtype: int64

```

```
[204]: filt=df['LanguageWorkedWith'].str.contains('Python',na=False)
```

```
[205]: filt
```

```

[205]: Respondent
1      True
2      True
3     False
4      True
5      True
...
88879   True
88880  False
88881   True
88882   True
88883  False
      Name: LanguageWorkedWith, Length: 88883, dtype: bool

```

```
[206]: df.loc[filt]
```

```

[206]:                                     MainBranch Hobbyist \
Respondent
1          I am a student who is learning to code      Yes
2          I am a student who is learning to code      No
4              I am a developer by profession          No
5              I am a developer by profession          Yes
8              I code primarily as a hobby             Yes
...
88874          I am a developer by profession          Yes
88876          I am a developer by profession          Yes
88879          I am a developer by profession          Yes
88881          I am a developer by profession          Yes
88882          I am a developer by profession          Yes

```

OpenSourcer \

Respondent

1	Never
2	Less than once per year
4	Never
5	Once a month or more often
8	Less than once per year
...	...
88874	Once a month or more often
88876	Never
88879	Never
88881	Once a month or more often
88882	Never

OpenSource \

Respondent

1	The quality of OSS and closed source software ...
2	The quality of OSS and closed source software ...
4	The quality of OSS and closed source software ...
5	OSS is, on average, of HIGHER quality than pro...
8	OSS is, on average, of HIGHER quality than pro...
...	...
88874	OSS is, on average, of LOWER quality than prop...
88876	OSS is, on average, of HIGHER quality than pro...
88879	The quality of OSS and closed source software ...
88881	OSS is, on average, of HIGHER quality than pro...
88882	OSS is, on average, of LOWER quality than prop...

Employment

Country \

Respondent

1	Not employed, and not looking for work	United Kingdom
2	Not employed, but looking for work	Bosnia and Herzegovina
4	Employed full-time	United States
5	Employed full-time	Ukraine
8	Not employed, but looking for work	India
...
88874	Employed full-time	United States
88876	Employed full-time	United States
88879	Employed full-time	Finland
88881	Employed full-time	Austria
88882	Employed full-time	Netherlands

Student

EdLevel \

Respondent

1	No	Primary/elementary school
2	Yes, full-time	Secondary school (e.g. American high school, G...
4	No	Bachelor's degree (BA, BS, B.Eng., etc.)
5	No	Bachelor's degree (BA, BS, B.Eng., etc.)
8	NaN	Bachelor's degree (BA, BS, B.Eng., etc.)

...
88874	No	Bachelor's degree (BA, BS, B.Eng., etc.)
88876	No	Bachelor's degree (BA, BS, B.Eng., etc.)
88879	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
88881	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
88882	Yes, full-time	Master's degree (MA, MS, M.Eng., MBA, etc.)

		UndergradMajor \
Respondent		
1		NaN
2		NaN
4	Computer science, computer engineering, or sof...	
5	Computer science, computer engineering, or sof...	
8	Computer science, computer engineering, or sof...	
...		...
88874	A social science (ex. anthropology, psychology...	
88876	Computer science, computer engineering, or sof...	
88879	Computer science, computer engineering, or sof...	
88881	Computer science, computer engineering, or sof...	
88882	Computer science, computer engineering, or sof...	

		EduOther \
Respondent		
1	Taught yourself a new language, framework, or ...	
2	Taken an online course in programming or softw...	
4	Taken an online course in programming or softw...	
5	Taken an online course in programming or softw...	
8	Taught yourself a new language, framework, or ...	
...		...
88874	Taken an online course in programming or softw...	
88876	Received on-the-job training in software devel...	
88879	Taught yourself a new language, framework, or ...	
88881	Taken an online course in programming or softw...	
88882	Participated in online coding competitions (e...	

		OrgSize \
Respondent		
1		NaN
2		NaN
4	100 to 499 employees	
5	10,000 or more employees	
8		NaN
...		...
88874	10,000 or more employees	
88876	10,000 or more employees	
88879	20 to 99 employees	
88881	100 to 499 employees	

88882 100 to 499 employees

		DevType	YearsCode	\
Respondent				
1		NaN	4	
2	Developer, desktop or enterprise applications;...		NaN	
4	Developer, full-stack		3	
5	Academic researcher;Developer, desktop or ente...		16	
8	Developer, back-end;Engineer, site reliability		8	
...		
88874	Data scientist or machine learning specialist;...		7	
88876	Developer, back-end;Developer, game or graphics		8	
88879	Developer, desktop or enterprise applications;...		17	
88881	Developer, full-stack;Engineer, site reliability		18	
88882	Academic researcher;Database administrator;Dev...		10	

	Age1stCode	YearsCodePro	CareerSat	\
Respondent				
1	10	NaN	NaN	
2	17	NaN	NaN	
4	16	Less than 1 year	Very satisfied	
5	14	9	Very dissatisfied	
8	16	NaN	NaN	
...	
88874	19	4	Very satisfied	
88876	15	2	Very satisfied	
88879	16	7	Slightly satisfied	
88881	17	9	Neither satisfied nor dissatisfied	
88882	15	8	Slightly dissatisfied	

	JobSat	MgrIdiot	\
Respondent			
1	NaN	NaN	
2	NaN	NaN	
4	Slightly satisfied	Very confident	
5	Slightly dissatisfied	Somewhat confident	
8	NaN	NaN	
...	
88874	Very satisfied	NaN	
88876	Slightly satisfied	Somewhat confident	
88879	Neither satisfied nor dissatisfied	Not at all confident	
88881	Neither satisfied nor dissatisfied	Very confident	
88882	Very dissatisfied	Not at all confident	

	MgrMoney	MgrWant	\
Respondent			
1	NaN	NaN	

2	NaN	NaN
4	No	Not sure
5	Yes	No
8	NaN	NaN
...
88874	NaN	NaN
88876	Yes	Not sure
88879	Not sure	I am already a manager
88881	No	No
88882	Yes	Yes

JobSeek \

Respondent

1	NaN
2	I am actively looking for a job
4	I am not interested in new job opportunities
5	I am not interested in new job opportunities
8	NaN
...	...
88874	I am not interested in new job opportunities
88876	I'm not actively looking, but I am open to new...
88879	I'm not actively looking, but I am open to new...
88881	I am not interested in new job opportunities
88882	I'm not actively looking, but I am open to new...

LastHireDate \

Respondent

1	NaN
2	I've never had a job
4	Less than a year ago
5	Less than a year ago
8	NaN
...	...
88874	Less than a year ago
88876	1-2 years ago
88879	More than 4 years ago
88881	More than 4 years ago
88882	Less than a year ago

LastInt FizzBuzz \

Respondent

1	NaN	NaN
2	NaN	NaN
4	Write code by hand (e.g., on a whiteboard);Int...	No
5	Write any code;Write code by hand (e.g., on a ...	No
8	NaN	NaN
...

88874	Write code by hand (e.g., on a whiteboard);Sol...	No
88876	Write code by hand (e.g., on a whiteboard)	No
88879	Complete a take-home project;Interview with pe...	No
88881	Write any code;Complete a take-home project;In...	No
88882	Write any code;Complete a take-home project;In...	No

Respondent	JobFactors \
1	NaN
2	Financial performance or funding status of the...
4	Languages, frameworks, and other technologies ...
5	Industry that I'd be working in;Languages, fra...
8	NaN
...	...
88874	Specific department or team I'd be working on;...
88876	Office environment or company culture;Remote w...
88879	Languages, frameworks, and other technologies ...
88881	Office environment or company culture;Diversit...
88882	Office environment or company culture;Remote w...

Respondent	ResumeUpdate	CurrencySymbol \
1	NaN	NaN
2	Something else changed (education, award, medi...	NaN
4	I was preparing for a job search	USD
5	I was preparing for a job search	UAH
8	NaN	NaN
...
88874	I was preparing for a job search	USD
88876	My job status changed (promotion, new job, etc.)	USD
88879	I had a negative experience or interaction at ...	EUR
88881	Something else changed (education, award, medi...	EUR
88882	I had a negative experience or interaction at ...	EUR

Respondent	CurrencyDesc	CompTotal	CompFreq	ConvertedComp \
1	NaN	NaN	NaN	NaN
2	NaN	NaN	NaN	NaN
4	United States dollar	61000.0	Yearly	61000.0
5	Ukrainian hryvnia	NaN	NaN	NaN
8	NaN	NaN	NaN	NaN
...
88874	United States dollar	185000.0	Weekly	2000000.0
88876	United States dollar	180000.0	Yearly	180000.0
88879	European Euro	6000.0	Monthly	82488.0
88881	European Euro	60000.0	Yearly	68745.0
88882	European Euro	42768.0	Monthly	588012.0

Respondent	WorkWeekHrs	WorkPlan \
1	NaN	NaN
2	NaN	NaN
4	80.00	There's no schedule or spec; I work on what se...
5	55.00	There is a schedule and/or spec (made by me or...
8	NaN	NaN
...
88874	50.00	There is a schedule and/or spec (made by me or...
88876	40.00	There is a schedule and/or spec (made by me or...
88879	37.75	There is a schedule and/or spec (made by me or...
88881	39.00	There is a schedule and/or spec (made by me or...
88882	40.00	There is a schedule and/or spec (made by me or...

Respondent	WorkChallenge \
1	NaN
2	NaN
4	NaN
5	Being tasked with non-development work;Inadequ...
8	NaN
...	...
88874	Being tasked with non-development work;Not eno...
88876	Distracting work environment;Meetings;Time spe...
88879	Being tasked with non-development work;Distrac...
88881	Distracting work environment;Not enough people...
88882	Distracting work environment;Lack of support f...

Respondent	WorkRemote	WorkLoc \
1	NaN	NaN
2	NaN	NaN
4	Less than once per month / Never	Home
5	A few days each month	Office
8	NaN	NaN
...
88874	About half the time	Office
88876	Less than half the time, but at least one day ...	Office
88879	Less than once per month / Never	Home
88881	A few days each month	Office
88882	Less than once per month / Never	Home

Respondent	ImpSyn	CodeRev \
1	NaN	NaN
2	NaN	NaN

4	A little below average		No
5	A little above average	Yes, because I see value in code review	
8		NaN	NaN
...
88874	A little above average	Yes, because I see value in code review	
88876	Average	Yes, because I see value in code review	
88879	Far above average	Yes, because I see value in code review	
88881	A little below average	Yes, because I see value in code review	
88882	Far above average	Yes, because I see value in code review	

	CodeRevHrs	UnitTests \
Respondent		
1	NaN	NaN
2	NaN	NaN
4	NaN	No, but I think we should
5	NaN	Yes, it's part of our process
8	NaN	NaN
...
88874	5.0	Yes, it's part of our process
88876	3.0	Yes, it's part of our process
88879	10.0	Yes, it's part of our process
88881	10.0	Yes, it's part of our process
88882	5.0	Yes, it's part of our process

	PurchaseHow \
Respondent	
1	NaN
2	NaN
4	Developers typically have the most influence o...
5	Not sure
8	NaN
...	...
88874	Developers and management have nearly equal in...
88876	Not sure
88879	Developers and management have nearly equal in...
88881	The CTO, CIO, or other management purchase new...
88882	Not sure

	PurchaseWhat \
Respondent	
1	NaN
2	NaN
4	I have little or no influence
5	I have little or no influence
8	NaN
...	...
88874	I have some influence

88876 I have little or no influence
 88879 I have little or no influence
 88881 I have little or no influence
 88882 I have little or no influence

LanguageWorkedWith \

Respondent

1 HTML/CSS; Java; JavaScript; Python
 2 C++; HTML/CSS; Python
 4 C; C++; C#; Python; SQL
 5 C++; HTML/CSS; Java; JavaScript; Python; SQL; VBA
 8 Bash/Shell/PowerShell; C; C++; HTML/CSS; Java; Java...
 ...
 88874 C++; Python; Scala; SQL
 88876 Bash/Shell/PowerShell; C#; HTML/CSS; Java; Python; ...
 88879 Bash/Shell/PowerShell; C++; Python
 88881 Bash/Shell/PowerShell; Go; HTML/CSS; Java; JavaScr...
 88882 C#; HTML/CSS; Java; JavaScript; PHP; Python

LanguageDesireNextYear \

Respondent

1 C; C++; C#; Go; HTML/CSS; Java; JavaScript; Python; SQL
 2 C++; HTML/CSS; JavaScript; SQL
 4 C; C#; JavaScript; SQL
 5 HTML/CSS; Java; JavaScript; SQL; WebAssembly
 8 Bash/Shell/PowerShell; C; C++; Elixir; Erlang; Go; P...
 ...
 88874 NaN
 88876 C#; Java; Kotlin; Scala
 88879 C++
 88881 Bash/Shell/PowerShell; Go; HTML/CSS; JavaScript; P...
 88882 C#; Java; JavaScript; PHP

DatabaseWorkedWith \

Respondent

1 SQLite
 2 NaN
 4 MySQL; SQLite
 5 Couchbase; MongoDB; MySQL; Oracle; PostgreSQL; SQLite
 8 Cassandra; Elasticsearch; MongoDB; MySQL; Oracle; R...
 ...
 88874 Elasticsearch; PostgreSQL; SQLite
 88876 DynamoDB; MySQL
 88879 NaN
 88881 PostgreSQL; Redis
 88882 MariaDB; PostgreSQL

Respondent	DatabaseDesireNextYear \
1	MySQL
2	MySQL
4	MySQL;SQLite
5	Couchbase;Firebase;MongoDB;MySQL;Oracle;Postgr...
8	Cassandra;DynamoDB;Elasticsearch;Firebase;Mong...
...	...
88874	NaN
88876	DynamoDB
88879	NaN
88881	Elasticsearch;PostgreSQL;Redis
88882	MariaDB;PostgreSQL

Respondent	PlatformWorkedWith \
1	MacOS;Windows
2	Windows
4	Linux;Windows
5	Android;Linux;MacOS;Slack;Windows
8	AWS;Docker;Heroku;Linux;MacOS;Slack
...	...
88874	AWS;Docker;Linux;MacOS;Slack
88876	AWS;Linux;MacOS;Windows
88879	Android;Linux;Windows
88881	Docker;Kubernetes;Linux;MacOS;Microsoft Azure;...
88882	Android;Arduino;Linux;Raspberry Pi;WordPress

Respondent	PlatformDesireNextYear \
1	Android;Arduino;Windows
2	Windows
4	Linux;Windows
5	Android;Docker;Kubernetes;Linux;Slack
8	Android;Arduino;AWS;Docker;Google Cloud Platfo...
...	...
88874	NaN
88876	Android;AWS;iOS;Linux;MacOS;Windows
88879	Linux;Windows
88881	Docker;Google Cloud Platform;iOS;Kubernetes;Li...
88882	Android;Arduino;Linux;Raspberry Pi;WordPress

Respondent	WebFrameWorkedWith \
1	Django;Flask
2	Django
4	NaN

5	Django;Express;Flask;jQuery;React.js;Spring
8	Express;Flask;React.js;Spring
...	...
88874	NaN
88876	NaN
88879	NaN
88881	Django;React.js
88882	jQuery;React.js

	WebFrameDesireNextYear \
Respondent	
1	Flask;jQuery
2	Django
4	NaN
5	Flask;jQuery;React.js;Spring
8	Django;Express;Flask;React.js;Vue.js
...	...
88874	NaN
88876	NaN
88879	NaN
88881	Angular/Angular.js;Django;React.js
88882	jQuery;React.js

	MiscTechWorkedWith \
Respondent	
1	Node.js
2	NaN
4	.NET
5	Cordova;Node.js
8	Hadoop;Node.js;Pandas
...	...
88874	Apache Spark;Pandas;TensorFlow
88876	Apache Spark;Hadoop;.NET Core;Unity 3D
88879	NaN
88881	Ansible
88882	Unity 3D

	MiscTechDesireNextYear \
Respondent	
1	Node.js
2	NaN
4	.NET
5	Apache Spark;Hadoop;Node.js;React Native
8	Ansible;Apache Spark;Chef;Hadoop;Node.js;Panda...
...	...
88874	NaN
88876	Apache Spark;CryEngine;Hadoop;.NET;.NET Core;T...

88879	TensorFlow;Unity 3D;Unreal Engine
88881	Ansible;Node.js
88882	Unity 3D

	DevEnviron	OpSys \
Respondent		
1	IntelliJ;Notepad++;PyCharm	Windows
2	Atom;PyCharm	Windows
4	Eclipse;Vim;Visual Studio;Visual Studio Code	Windows
5	IntelliJ;Notepad++;Vim	Linux-based
8	Atom;IntelliJ;IPython / Jupyter;PyCharm;Visual...	Linux-based
...
88874	IPython / Jupyter;PyCharm;Sublime Text;Vim	Linux-based
88876	IntelliJ;Notepad++;PyCharm;Sublime Text;Vim;Vi...	MacOS
88879	Android Studio;Notepad++;Vim;Visual Studio	Windows
88881	Emacs;Vim;Visual Studio Code	MacOS
88882	Android Studio;IntelliJ;Notepad++;Vim;Visual S...	Linux-based

	Containers \
Respondent	
1	I do not use containers
2	I do not use containers
4	I do not use containers
5	Outside of work, for personal projects
8	Development;Testing;Production;Outside of work...
...	...
88874	Development;Testing;Production
88876	I do not use containers
88879	I do not use containers
88881	Development;Testing;Production;Outside of work...
88882	I do not use containers

	BlockchainOrg \
Respondent	
1	NaN
2	NaN
4	Not at all
5	Not at all
8	NaN
...	...
88874	NaN
88876	NaN
88879	Not at all
88881	Non-currency applications of blockchain
88882	Not at all

	BlockchainIs BetterLife \
--	---------------------------

Respondent

1		NaN	Yes
2	Useful across many domains and could change ma...		Yes
4	Useful for decentralized currency (i.e., Bitcoin)		Yes
5		NaN	Yes
8	Useful across many domains and could change ma...		Yes
...	
88874		NaN	Yes
88876		A passing fad	Yes
88879		A passing fad	Yes
88881	Useful for immutable record keeping outside of...		No
88882		A passing fad	Yes

ITperson OffOn SocialMedia \

Respondent

1	Fortunately, someone else has that title	Yes	Twitter
2		Yes	Instagram
4		SIGH	Reddit
5	Also	Yes	Facebook
8		SIGH	YouTube
...	
88874		Yes	Reddit
88876		SIGH	Reddit
88879		NaN	YouTube
88881		Yes	NaN
88882		Yes	Instagram

Extraversion ScreenName SOVisit1st \

Respondent

1	Online	Username	2017
2	Online	Username	2017
4	In real life (in person)	Username	2014
5	In real life (in person)	Username	I don't remember
8	In real life (in person)	Handle	2012
...
88874	In real life (in person)	Username	2012
88876	Neither	UserID	2011
88879	Neither	Username	I don't remember
88881	Online	Login	2008
88882	Neither	Username	2009

SOVisitFreq \

Respondent

1	A few times per month or weekly
2	Daily or almost daily
4	Daily or almost daily
5	Multiple times per day

8	A few times per week
...	...
88874	A few times per week
88876	A few times per month or weekly
88879	A few times per month or weekly
88881	A few times per month or weekly
88882	A few times per week

SOVisitTo \

Respondent

1	Find answers to specific questions;Learn how t...
2	Find answers to specific questions;Learn how t...
4	Find answers to specific questions;Pass the ti...
5	Find answers to specific questions
8	Find answers to specific questions;Learn how t...
...	...
88874	Find answers to specific questions;Learn how t...
88876	Find answers to specific questions
88879	Find answers to specific questions
88881	Find answers to specific questions
88882	Find answers to specific questions

SOFindAnswer

SOTimeSaved \

Respondent

1	3-5 times per week	Stack Overflow was much faster
2	3-5 times per week	Stack Overflow was much faster
4	1-2 times per week	Stack Overflow was much faster
5	More than 10 times per week	Stack Overflow was much faster
8	Less than once per week	Stack Overflow was slightly faster
...
88874	1-2 times per week	Stack Overflow was much faster
88876	1-2 times per week	Stack Overflow was much faster
88879	Less than once per week	Stack Overflow was slightly faster
88881	More than 10 times per week	Stack Overflow was slightly faster
88882	3-5 times per week	Stack Overflow was slightly faster

SOHowMuchTime SOAccount

SOPartFreq \

Respondent

1	31-60 minutes	No	NaN
2	11-30 minutes	Yes	A few times per month or weekly
4	31-60 minutes	Yes	Less than once per month or monthly
5	NaN	Yes	A few times per month or weekly
8	11-30 minutes	Yes	Less than once per month or monthly
...
88874	60+ minutes	Yes	A few times per month or weekly
88876	60+ minutes	Yes	Less than once per month or monthly
88879	60+ minutes	No	NaN

88881	11-30 minutes	Yes	Less than once per month or monthly
88882	11-30 minutes	Yes	Less than once per month or monthly

SOJobs \

Respondent

1	No, I didn't know that Stack Overflow had a jo...
2	No, I knew that Stack Overflow had a job board...
4	Yes
5	No, I knew that Stack Overflow had a job board...
8	Yes
...	...
88874	Yes
88876	No, I didn't know that Stack Overflow had a jo...
88879	No, I didn't know that Stack Overflow had a jo...
88881	Yes
88882	No, I knew that Stack Overflow had a job board...

EntTeams \

Respondent

1	No, and I don't know what those are
2	No, and I don't know what those are
4	No, and I don't know what those are
5	No, I've heard of them, but I am not part of a...
8	No, and I don't know what those are
...	...
88874	No, and I don't know what those are
88876	No, and I don't know what those are
88879	No, and I don't know what those are
88881	No, I've heard of them, but I am not part of a...
88882	No, and I don't know what those are

SOCComm \

Respondent

1	Neutral
2	Yes, somewhat
4	No, not really
5	Yes, definitely
8	Yes, definitely
...	...
88874	Yes, somewhat
88876	Yes, somewhat
88879	No, not at all
88881	Neutral
88882	No, not really

WelcomeChange \

Respondent

1	Just as welcome now as I felt last year
2	Just as welcome now as I felt last year
4	Just as welcome now as I felt last year
5	Just as welcome now as I felt last year
8	A lot more welcome now than last year
...	...
88874	Just as welcome now as I felt last year
88876	A lot less welcome now than last year
88879	Not applicable - I did not use Stack Overflow ...
88881	NaN
88882	Just as welcome now as I felt last year

		SONewContent	Age	Gender \
Respondent				
1	Tech articles written by other developers;Indu...	14.0		Man
2	Tech articles written by other developers;Indu...	19.0		Man
4	Tech articles written by other developers;Indu...	22.0		Man
5	Tech meetups or events in your area;Courses on...	30.0		Man
8	Tech articles written by other developers;Indu...	24.0		Man
...	
88874		NaN	26.0	Man
88876		NaN	23.0	Man
88879		NaN	34.0	Man
88881		NaN	37.0	Man
88882		NaN	NaN	Man

	Trans	Sexuality \
Respondent		
1	No	Straight / Heterosexual
2	No	Straight / Heterosexual
4	No	Straight / Heterosexual
5	No	Straight / Heterosexual
8	No	Straight / Heterosexual
...
88874	No	Straight / Heterosexual
88876	No	Straight / Heterosexual
88879	No	Straight / Heterosexual
88881	No	Straight / Heterosexual
88882	No	Straight / Heterosexual

		Ethnicity Dependents \
Respondent		
1		NaN No
2		NaN No
4	White or of European descent	No
5	White or of European descent;Multiracial	No
8		NaN NaN

...
88874	White or of European descent	No
88876	White or of European descent	No
88879	White or of European descent	No
88881	White or of European descent	No
88882	White or of European descent	Yes

	SurveyLength	SurveyEase
Respondent		
1	Appropriate in length	Neither easy nor difficult
2	Appropriate in length	Neither easy nor difficult
4	Appropriate in length	Easy
5	Appropriate in length	Easy
8	Appropriate in length	Neither easy nor difficult
...
88874	Appropriate in length	Easy
88876	Appropriate in length	Easy
88879	Appropriate in length	Easy
88881	Appropriate in length	Easy
88882	Too long	Easy

[36443 rows x 84 columns]

```
[207]: df.rename(columns={'ConvertedComp': 'SalaryUSD'}, inplace= True)
```

```
[208]: df.columns
```

```
[208]: Index(['MainBranch', 'Hobbyist', 'OpenSourcer', 'OpenSource', 'Employment',
        'Country', 'Student', 'EdLevel', 'UndergradMajor', 'EduOther',
        'OrgSize', 'DevType', 'YearsCode', 'Age1stCode', 'YearsCodePro',
        'CareerSat', 'JobSat', 'MgrIdiot', 'MgrMoney', 'MgrWant', 'JobSeek',
        'LastHireDate', 'LastInt', 'FizzBuzz', 'JobFactors', 'ResumeUpdate',
        'CurrencySymbol', 'CurrencyDesc', 'CompTotal', 'CompFreq', 'SalaryUSD',
        'WorkWeekHrs', 'WorkPlan', 'WorkChallenge', 'WorkRemote', 'WorkLoc',
        'ImpSyn', 'CodeRev', 'CodeRevHrs', 'UnitTests', 'PurchaseHow',
        'PurchaseWhat', 'LanguageWorkedWith', 'LanguageDesireNextYear',
        'DatabaseWorkedWith', 'DatabaseDesireNextYear', 'PlatformWorkedWith',
        'PlatformDesireNextYear', 'WebFrameWorkedWith',
        'WebFrameDesireNextYear', 'MiscTechWorkedWith',
        'MiscTechDesireNextYear', 'DevEnviron', 'OpSys', 'Containers',
        'BlockchainOrg', 'BlockchainIs', 'BetterLife', 'ITperson', 'OffOn',
        'SocialMedia', 'Extraversion', 'ScreenName', 'SOVisit1st',
        'SOVisitFreq', 'SOVisitTo', 'SOFindAnswer', 'SOTimeSaved',
        'SOHowMuchTime', 'SOAccount', 'SOPartFreq', 'SOJobs', 'EntTeams',
        'SOComm', 'WelcomeChange', 'SONewContent', 'Age', 'Gender', 'Trans',
        'Sexuality', 'Ethnicity', 'Dependents', 'SurveyLength', 'SurveyEase'],
        dtype='object')
```

```
[209]: df['Hobbyist'].map({'Yes': True, 'No': False})
```

```
[209]: Respondent
1      True
2     False
3      True
4     False
5      True
...
88879   True
88880   True
88881   True
88882   True
88883   True
Name: Hobbyist, Length: 88883, dtype: bool
```

```
[210]: df['Hobbyist']=df['Hobbyist'].map({'Yes': True, 'No': False})
```

```
[211]: df
```

```
[211]:
```

	MainBranch	Hobbyist	\
Respondent			
1	I am a student who is learning to code	True	
2	I am a student who is learning to code	False	
3	I am not primarily a developer, but I write co...	True	
4	I am a developer by profession	False	
5	I am a developer by profession	True	
...	
88879	I am a developer by profession	True	
88880	I am not primarily a developer, but I write co...	True	
88881	I am a developer by profession	True	
88882	I am a developer by profession	True	
88883	I am a developer by profession	True	

```

OpenSourcer \
Respondent
1      Never
2    Less than once per year
3      Never
4      Never
5    Once a month or more often
...
88879   Never
88880   Never
88881    Once a month or more often
88882   Never
88883    Once a month or more often

```

OpenSource \

Respondent

1	The quality of OSS and closed source software ...
2	The quality of OSS and closed source software ...
3	The quality of OSS and closed source software ...
4	The quality of OSS and closed source software ...
5	OSS is, on average, of HIGHER quality than pro...
...	...
88879	The quality of OSS and closed source software ...
88880	The quality of OSS and closed source software ...
88881	OSS is, on average, of HIGHER quality than pro...
88882	OSS is, on average, of LOWER quality than prop...
88883	OSS is, on average, of HIGHER quality than pro...

Employment

Country \

Respondent

1	Not employed, and not looking for work	United Kingdom
2	Not employed, but looking for work	Bosnia and Herzegovina
3	Employed full-time	Thailand
4	Employed full-time	United States
5	Employed full-time	Ukraine
...
88879	Employed full-time	Finland
88880	Employed full-time	United States
88881	Employed full-time	Austria
88882	Employed full-time	Netherlands
88883	Employed full-time	Greece

Student

EdLevel \

Respondent

1	No	Primary/elementary school
2	Yes, full-time	Secondary school (e.g. American high school, G...
3	No	Bachelor's degree (BA, BS, B.Eng., etc.)
4	No	Bachelor's degree (BA, BS, B.Eng., etc.)
5	No	Bachelor's degree (BA, BS, B.Eng., etc.)
...
88879	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
88880	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
88881	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
88882	Yes, full-time	Master's degree (MA, MS, M.Eng., MBA, etc.)
88883	No	Bachelor's degree (BA, BS, B.Eng., etc.)

UndergradMajor \

Respondent

1	NaN
2	NaN

3	Web development or web design
4	Computer science, computer engineering, or sof...
5	Computer science, computer engineering, or sof...
...	...
88879	Computer science, computer engineering, or sof...
88880	Computer science, computer engineering, or sof...
88881	Computer science, computer engineering, or sof...
88882	Computer science, computer engineering, or sof...
88883	Computer science, computer engineering, or sof...

EduOther \

Respondent

1	Taught yourself a new language, framework, or ...
2	Taken an online course in programming or softw...
3	Taught yourself a new language, framework, or ...
4	Taken an online course in programming or softw...
5	Taken an online course in programming or softw...
...	...
88879	Taught yourself a new language, framework, or ...
88880	Taught yourself a new language, framework, or ...
88881	Taken an online course in programming or softw...
88882	Participated in online coding competitions (e...
88883	Taught yourself a new language, framework, or ...

OrgSize \

Respondent

1	NaN
2	NaN
3	100 to 499 employees
4	100 to 499 employees
5	10,000 or more employees
...	...
88879	20 to 99 employees
88880	2-9 employees
88881	100 to 499 employees
88882	100 to 499 employees
88883	20 to 99 employees

DevType YearsCode \

Respondent

1	NaN	4
2	Developer, desktop or enterprise applications;...	NaN
3	Designer;Developer, back-end;Developer, front-...	3
4	Developer, full-stack	3
5	Academic researcher;Developer, desktop or ente...	16
...
88879	Developer, desktop or enterprise applications;...	17

88880	Developer, mobile;Engineering manager;Product ...	20
88881	Developer, full-stack;Engineer, site reliability	18
88882	Academic researcher;Database administrator;Dev...	10
88883	Developer, back-end;Developer, desktop or ente...	9

	Age1stCode	YearsCodePro	CareerSat \
Respondent			
1	10	NaN	NaN
2	17	NaN	NaN
3	22	1	Slightly satisfied
4	16	Less than 1 year	Very satisfied
5	14	9	Very dissatisfied
...
88879	16	7	Slightly satisfied
88880	12	20	Slightly dissatisfied
88881	17	9	Neither satisfied nor dissatisfied
88882	15	8	Slightly dissatisfied
88883	15	5	Slightly dissatisfied

	JobSat	MgrIdiot \
Respondent		
1	NaN	NaN
2	NaN	NaN
3	Slightly satisfied	Not at all confident
4	Slightly satisfied	Very confident
5	Slightly dissatisfied	Somewhat confident
...
88879	Neither satisfied nor dissatisfied	Not at all confident
88880	Neither satisfied nor dissatisfied	NaN
88881	Neither satisfied nor dissatisfied	Very confident
88882	Very dissatisfied	Not at all confident
88883	Slightly dissatisfied	Not at all confident

	MgrMoney	MgrWant \
Respondent		
1	NaN	NaN
2	NaN	NaN
3	Not sure	Not sure
4	No	Not sure
5	Yes	No
...
88879	Not sure	I am already a manager
88880	NaN	NaN
88881	No	No
88882	Yes	Yes
88883	No	No

Respondent	JobSeek \
1	NaN
2	I am actively looking for a job
3	I'm not actively looking, but I am open to new...
4	I am not interested in new job opportunities
5	I am not interested in new job opportunities
...	...
88879	I'm not actively looking, but I am open to new...
88880	I'm not actively looking, but I am open to new...
88881	I am not interested in new job opportunities
88882	I'm not actively looking, but I am open to new...
88883	I'm not actively looking, but I am open to new...

Respondent	LastHireDate \
1	NaN
2	I've never had a job
3	1-2 years ago
4	Less than a year ago
5	Less than a year ago
...	...
88879	More than 4 years ago
88880	Less than a year ago
88881	More than 4 years ago
88882	Less than a year ago
88883	More than 4 years ago

Respondent	LastInt FizzBuzz \
1	NaN NaN
2	NaN NaN
3	Interview with people in peer roles No
4	Write code by hand (e.g., on a whiteboard);Int... No
5	Write any code;Write code by hand (e.g., on a ... No
...	...
88879	Complete a take-home project;Interview with pe... No
88880	Interview with people in peer roles;Interview ... No
88881	Write any code;Complete a take-home project;In... No
88882	Write any code;Complete a take-home project;In... No
88883	Interview with people in senior / management r... No

Respondent	JobFactors \
1	NaN
2	Financial performance or funding status of the...
3	Languages, frameworks, and other technologies ...

4 Languages, frameworks, and other technologies ...
 5 Industry that I'd be working in;Languages, fra...
 ...
 88879 Languages, frameworks, and other technologies ...
 88880 Office environment or company culture;Remote w...
 88881 Office environment or company culture;Diversit...
 88882 Office environment or company culture;Remote w...
 88883 Financial performance or funding status of the...

Respondent	ResumeUpdate	CurrencySymbol	\
1		NaN	NaN
2	Something else changed (education, award, medi...		NaN
3	I was preparing for a job search		THB
4	I was preparing for a job search		USD
5	I was preparing for a job search		UAH
...			
88879	I had a negative experience or interaction at ...		EUR
88880	I was preparing for a job search		USD
88881	Something else changed (education, award, medi...		EUR
88882	I had a negative experience or interaction at ...		EUR
88883	My job status changed (promotion, new job, etc.)		EUR

Respondent	CurrencyDesc	CompTotal	CompFreq	SalaryUSD	WorkWeekHrs	\
1	NaN	NaN	NaN	NaN	NaN	
2	NaN	NaN	NaN	NaN	NaN	
3	Thai baht	23000.0	Monthly	8820.0	40.00	
4	United States dollar	61000.0	Yearly	61000.0	80.00	
5	Ukrainian hryvnia	NaN	NaN	NaN	55.00	
...						
88879	European Euro	6000.0	Monthly	82488.0	37.75	
88880	United States dollar	NaN	NaN	NaN	NaN	
88881	European Euro	60000.0	Yearly	68745.0	39.00	
88882	European Euro	42768.0	Monthly	588012.0	40.00	
88883	European Euro	20000.0	Yearly	22915.0	48.00	

Respondent	WorkPlan	\
1		NaN
2		NaN
3	There's no schedule or spec; I work on what se...	
4	There's no schedule or spec; I work on what se...	
5	There is a schedule and/or spec (made by me or...	
...		
88879	There is a schedule and/or spec (made by me or...	
88880	There is a schedule and/or spec (made by me or...	

88881 There is a schedule and/or spec (made by me or...
88882 There is a schedule and/or spec (made by me or...
88883 There's no schedule or spec; I work on what se...

Respondent	WorkChallenge \
1	NaN
2	NaN
3	Distracting work environment;Inadequate access...
4	NaN
5	Being tasked with non-development work;Inadequ...
...	...
88879	Being tasked with non-development work;Distrac...
88880	Distracting work environment;Meetings;Not enou...
88881	Distracting work environment;Not enough people...
88882	Distracting work environment;Lack of support f...
88883	Inadequate access to necessary tools;Not enoug...

Respondent	WorkRemote	WorkLoc \
1	NaN	NaN
2	NaN	NaN
3	Less than once per month / Never	Home
4	Less than once per month / Never	Home
5	A few days each month	Office
...
88879	Less than once per month / Never	Home
88880	More than half, but not all, the time	Home
88881	A few days each month	Office
88882	Less than once per month / Never	Home
88883	Less than half the time, but at least one day ...	Home

Respondent	ImpSyn	CodeRev \
1	NaN	NaN
2	NaN	NaN
3	Average	No
4	A little below average	No
5	A little above average	Yes, because I see value in code review
...
88879	Far above average	Yes, because I see value in code review
88880	NaN	Yes, because I see value in code review
88881	A little below average	Yes, because I see value in code review
88882	Far above average	Yes, because I see value in code review
88883	Far above average	No

CodeRevHrs	UnitTests \
------------	-------------

Respondent		
1	NaN	NaN
2	NaN	NaN
3	NaN	No, but I think we should
4	NaN	No, but I think we should
5	NaN	Yes, it's part of our process
...
88879	10.0	Yes, it's part of our process
88880	NaN	Yes, it's not part of our process but the deve...
88881	10.0	Yes, it's part of our process
88882	5.0	Yes, it's part of our process
88883	NaN	Yes, it's part of our process

PurchaseHow \

Respondent	
1	NaN
2	NaN
3	Not sure
4	Developers typically have the most influence o...
5	Not sure
...	...
88879	Developers and management have nearly equal in...
88880	NaN
88881	The CTO, CIO, or other management purchase new...
88882	Not sure
88883	Not sure

PurchaseWhat \

Respondent	
1	NaN
2	NaN
3	I have little or no influence
4	I have little or no influence
5	I have little or no influence
...	...
88879	I have little or no influence
88880	NaN
88881	I have little or no influence
88882	I have little or no influence
88883	I have little or no influence

LanguageWorkedWith \

Respondent	
1	HTML/CSS;Java;JavaScript;Python
2	C++;HTML/CSS;Python
3	HTML/CSS
4	C;C++;C#;Python;SQL

5	C++;HTML/CSS;Java;JavaScript;Python;SQL;VBA
...	...
88879	Bash/Shell/PowerShell;C++;Python
88880	NaN
88881	Bash/Shell/PowerShell;Go;HTML/CSS;Java;JavaScr...
88882	C#;HTML/CSS;Java;JavaScript;PHP;Python
88883	Go;HTML/CSS;Java;JavaScript;Other(s):

Respondent	LanguageDesireNextYear \
1	C;C++;C#;Go;HTML/CSS;Java;JavaScript;Python;SQL
2	C++;HTML/CSS;JavaScript;SQL
3	Elixir;HTML/CSS
4	C;C#;JavaScript;SQL
5	HTML/CSS;Java;JavaScript;SQL;WebAssembly
...	...
88879	C++
88880	NaN
88881	Bash/Shell/PowerShell;Go;HTML/CSS;JavaScript;P...
88882	C#;Java;JavaScript;PHP
88883	C++;Go;Java;Rust

Respondent	DatabaseWorkedWith \
1	SQLite
2	NaN
3	PostgreSQL
4	MySQL;SQLite
5	Couchbase;MongoDB;MySQL;Oracle;PostgreSQL;SQLite
...	...
88879	NaN
88880	NaN
88881	PostgreSQL;Redis
88882	MariaDB;PostgreSQL
88883	Cassandra;MariaDB;PostgreSQL;SQLite

Respondent	DatabaseDesireNextYear \
1	MySQL
2	MySQL
3	PostgreSQL
4	MySQL;SQLite
5	Couchbase;Firebase;MongoDB;MySQL;Oracle;Postgr...
...	...
88879	NaN
88880	NaN
88881	Elasticsearch;PostgreSQL;Redis

88882	MariaDB;PostgreSQL
88883	PostgreSQL

Respondent	PlatformWorkedWith \
1	MacOS;Windows
2	Windows
3	NaN
4	Linux;Windows
5	Android;Linux;MacOS;Slack;Windows
...	...
88879	Android;Linux;Windows
88880	NaN
88881	Docker;Kubernetes;Linux;MacOS;Microsoft Azure;...
88882	Android;Arduino;Linux;Raspberry Pi;WordPress
88883	Docker;Linux

Respondent	PlatformDesireNextYear \
1	Android;Arduino;Windows
2	Windows
3	NaN
4	Linux;Windows
5	Android;Docker;Kubernetes;Linux;Slack
...	...
88879	Linux;Windows
88880	NaN
88881	Docker;Google Cloud Platform;iOS;Kubernetes;Li...
88882	Android;Arduino;Linux;Raspberry Pi;WordPress
88883	Docker;Linux

Respondent	WebFrameWorkedWith \
1	Django;Flask
2	Django
3	NaN
4	NaN
5	Django;Express;Flask;jQuery;React.js;Spring
...	...
88879	NaN
88880	NaN
88881	Django;React.js
88882	jQuery;React.js
88883	Spring;Vue.js

Respondent	WebFrameDesireNextYear MiscTechWorkedWith \
------------	---

1	Flask;jQuery	Node.js
2	Django	NaN
3	Other(s):	NaN
4	NaN	.NET
5	Flask;jQuery;React.js;Spring	Cordova;Node.js
...
88879	NaN	NaN
88880	NaN	NaN
88881	Angular/Angular.js;Django;React.js	Ansible
88882	jQuery;React.js	Unity 3D
88883	Spring;Vue.js	NaN

MiscTechDesireNextYear \

Respondent

1	Node.js
2	NaN
3	NaN
4	.NET
5	Apache Spark;Hadoop;Node.js;React Native
...	...
88879	TensorFlow;Unity 3D;Unreal Engine
88880	NaN
88881	Ansible;Node.js
88882	Unity 3D
88883	NaN

DevEnviron OpSys \

Respondent

1	IntelliJ;Notepad++;PyCharm	Windows
2	Atom;PyCharm	Windows
3	Vim;Visual Studio Code	Linux-based
4	Eclipse;Vim;Visual Studio;Visual Studio Code	Windows
5	IntelliJ;Notepad++;Vim	Linux-based
...
88879	Android Studio;Notepad++;Vim;Visual Studio	Windows
88880	NaN	NaN
88881	Emacs;Vim;Visual Studio Code	MacOS
88882	Android Studio;IntelliJ;Notepad++;Vim;Visual S...	Linux-based
88883	IntelliJ;Sublime Text	Linux-based

Containers \

Respondent

1	I do not use containers
2	I do not use containers
3	I do not use containers
4	I do not use containers
5	Outside of work, for personal projects

...	...
88879	I do not use containers
88880	NaN
88881	Development;Testing;Production;Outside of work...
88882	I do not use containers
88883	Testing;Production;Outside of work, for person...

	BlockchainOrg \
Respondent	
1	NaN
2	NaN
3	NaN
4	Not at all
5	Not at all
...	...
88879	Not at all
88880	NaN
88881	Non-currency applications of blockchain
88882	Not at all
88883	Implementing cryptocurrency-based products

	BlockchainIs BetterLife \
Respondent	
1	NaN Yes
2	Useful across many domains and could change ma... Yes
3	NaN Yes
4	Useful for decentralized currency (i.e., Bitcoin) Yes
5	NaN Yes
...	...
88879	A passing fad Yes
88880	NaN NaN
88881	Useful for immutable record keeping outside of... No
88882	A passing fad Yes
88883	A passing fad Yes

	ITperson OffOn SocialMedia \
Respondent	
1	Fortunately, someone else has that title Yes Twitter
2	Yes Yes Instagram
3	Yes Yes Reddit
4	SIGH Yes Reddit
5	Also Yes Yes Facebook
...	...
88879	NaN NaN YouTube
88880	NaN NaN NaN
88881	Yes Yes NaN
88882	Yes Yes Instagram

88883	SIGH	Yes	Reddit
-------	------	-----	--------

Respondent	Extraversion	ScreenName	SOVisit1st
1	Online	Username	2017
2	Online	Username	2017
3	In real life (in person)	Username	2011
4	In real life (in person)	Username	2014
5	In real life (in person)	Username	I don't remember
...
88879	Neither	Username	I don't remember
88880	NaN	NaN	NaN
88881	Online	Login	2008
88882	Neither	Username	2009
88883	In real life (in person)	Username	2008

Respondent	SOVisitFreq \
1	A few times per month or weekly
2	Daily or almost daily
3	A few times per week
4	Daily or almost daily
5	Multiple times per day
...	...
88879	A few times per month or weekly
88880	NaN
88881	A few times per month or weekly
88882	A few times per week
88883	A few times per week

Respondent	SOVisitTo \
1	Find answers to specific questions;Learn how t...
2	Find answers to specific questions;Learn how t...
3	Find answers to specific questions;Learn how t...
4	Find answers to specific questions;Pass the ti...
5	Find answers to specific questions
...	...
88879	Find answers to specific questions
88880	NaN
88881	Find answers to specific questions
88882	Find answers to specific questions
88883	Find answers to specific questions;Learn how t...

Respondent	SOFindAnswer	SOTimeSaved \
1	3-5 times per week	Stack Overflow was much faster

2	3-5 times per week	Stack Overflow was much faster
3	6-10 times per week	They were about the same
4	1-2 times per week	Stack Overflow was much faster
5	More than 10 times per week	Stack Overflow was much faster
...
88879	Less than once per week	Stack Overflow was slightly faster
88880	NaN	NaN
88881	More than 10 times per week	Stack Overflow was slightly faster
88882	3-5 times per week	Stack Overflow was slightly faster
88883	1-2 times per week	They were about the same

	SOHowMuchTime	SOAccount	SOPartFreq \
Respondent			
1	31-60 minutes	No	NaN
2	11-30 minutes	Yes	A few times per month or weekly
3	NaN	Yes	Less than once per month or monthly
4	31-60 minutes	Yes	Less than once per month or monthly
5	NaN	Yes	A few times per month or weekly
...
88879	60+ minutes	No	NaN
88880	NaN	NaN	NaN
88881	11-30 minutes	Yes	Less than once per month or monthly
88882	11-30 minutes	Yes	Less than once per month or monthly
88883	NaN	Yes	A few times per month or weekly

	SOJobs \
Respondent	
1	No, I didn't know that Stack Overflow had a jo...
2	No, I knew that Stack Overflow had a job board...
3	Yes
4	Yes
5	No, I knew that Stack Overflow had a job board...
...	...
88879	No, I didn't know that Stack Overflow had a jo...
88880	NaN
88881	Yes
88882	No, I knew that Stack Overflow had a job board...
88883	No, I knew that Stack Overflow had a job board...

	EntTeams \
Respondent	
1	No, and I don't know what those are
2	No, and I don't know what those are
3	No, I've heard of them, but I am not part of a...
4	No, and I don't know what those are
5	No, I've heard of them, but I am not part of a...
...	...

88879	No, and I don't know what those are
88880	NaN
88881	No, I've heard of them, but I am not part of a...
88882	No, and I don't know what those are
88883	No, I've heard of them, but I am not part of a...

SOComm \	
Respondent	
1	Neutral
2	Yes, somewhat
3	Neutral
4	No, not really
5	Yes, definitely
...	...
88879	No, not at all
88880	NaN
88881	Neutral
88882	No, not really
88883	No, not really

WelcomeChange \	
Respondent	
1	Just as welcome now as I felt last year
2	Just as welcome now as I felt last year
3	Just as welcome now as I felt last year
4	Just as welcome now as I felt last year
5	Just as welcome now as I felt last year
...	...
88879	Not applicable - I did not use Stack Overflow ...
88880	NaN
88881	NaN
88882	Just as welcome now as I felt last year
88883	Just as welcome now as I felt last year

SONewContent Age Gender \			
Respondent			
1	Tech articles written by other developers;Indu...	14.0	Man
2	Tech articles written by other developers;Indu...	19.0	Man
3	Tech meetups or events in your area;Courses on...	28.0	Man
4	Tech articles written by other developers;Indu...	22.0	Man
5	Tech meetups or events in your area;Courses on...	30.0	Man
...
88879		NaN 34.0	Man
88880		NaN NaN	NaN
88881		NaN 37.0	Man
88882		NaN NaN	Man
88883	Tech articles written by other developers	33.0	Man

Respondent	Trans	Sexuality \
1	No	Straight / Heterosexual
2	No	Straight / Heterosexual
3	No	Straight / Heterosexual
4	No	Straight / Heterosexual
5	No	Straight / Heterosexual
...
88879	No	Straight / Heterosexual
88880	NaN	NaN
88881	No	Straight / Heterosexual
88882	No	Straight / Heterosexual
88883	No	Straight / Heterosexual

Respondent	Ethnicity Dependents \
1	NaN No
2	NaN No
3	NaN Yes
4	White or of European descent No
5	White or of European descent;Multiracial No
...	...
88879	White or of European descent No
88880	NaN NaN
88881	White or of European descent No
88882	White or of European descent Yes
88883	White or of European descent No

Respondent	SurveyLength	SurveyEase
1	Appropriate in length	Neither easy nor difficult
2	Appropriate in length	Neither easy nor difficult
3	Appropriate in length	Neither easy nor difficult
4	Appropriate in length	Easy
5	Appropriate in length	Easy
...
88879	Appropriate in length	Easy
88880	NaN	NaN
88881	Appropriate in length	Easy
88882	Too long	Easy
88883	Too short	Easy

[88883 rows x 84 columns]

```
[212]: df.sort_values(by=['Country', 'SalaryUSD'], ascending=[True, False], inplace=True)
```

```
df[['Country', 'SalaryUSD']].head(5)
```

```
[212]:
```

	Country	SalaryUSD
Respondent		
63129	Afghanistan	1000000.0
50499	Afghanistan	153216.0
39258	Afghanistan	19152.0
58450	Afghanistan	17556.0
7085	Afghanistan	14364.0

```
[213]: df['SalaryUSD'].nlargest(10)
```

```
[213]:
```

Respondent	
25983	2000000.0
87896	2000000.0
22013	2000000.0
28243	2000000.0
72732	2000000.0
78151	2000000.0
80200	2000000.0
52132	2000000.0
75561	2000000.0
32250	2000000.0

Name: SalaryUSD, dtype: float64

```
[214]: df['SalaryUSD'].nsmallest(5)
```

```
[214]:
```

Respondent	
722	0.0
28638	0.0
13825	0.0
40913	0.0
30630	0.0

Name: SalaryUSD, dtype: float64

```
[215]: df.nsmallest(5, 'SalaryUSD')
```

```
[215]:
```

	MainBranch	Hobbyist	\
Respondent			
722	I am a developer by profession	False	
28638	I am a developer by profession	True	
13825	I am a developer by profession	True	
40913	I am a developer by profession	True	
30630	I am a developer by profession	True	

OpenSourcer \

Respondent	
722	Less than once a month but more than once per ...

28638	Less than once a month but more than once per ...
13825	Never
40913	Less than once per year
30630	Less than once a month but more than once per ...

OpenSource \

Respondent	
722	The quality of OSS and closed source software ...
28638	OSS is, on average, of HIGHER quality than pro...
13825	The quality of OSS and closed source software ...
40913	The quality of OSS and closed source software ...
30630	The quality of OSS and closed source software ...

Employment Country \

Respondent		
722		NaN Afghanistan
28638	Independent contractor, freelancer, or self-em...	Afghanistan
13825		NaN Algeria
40913	Employed full-time	Armenia
30630	Employed full-time	Australia

Student EdLevel \

Respondent		
722	NaN	NaN
28638	NaN	Other doctoral degree (Ph.D, Ed.D., etc.)
13825	NaN	NaN
40913	No	Bachelor's degree (BA, BS, B.Eng., etc.)
30630	No	Master's degree (MA, MS, M.Eng., MBA, etc.)

UndergradMajor \

Respondent	
722	NaN
28638	I never declared a major
13825	NaN
40913	Computer science, computer engineering, or sof...
30630	NaN

EduOther OrgSize \

Respondent		
722		NaN NaN
28638		NaN NaN
13825		NaN NaN
40913	Taught yourself a new language, framework, or ...	2-9 employees
30630	Taken an online course in programming or softw...	2-9 employees

DevType \

Respondent

722	NaN
28638	NaN
13825	NaN
40913	Developer, desktop or enterprise applications;...
30630	Database administrator;Developer, back-end;Dev...

Respondent	YearsCode	Age1stCode	YearsCodePro \
722	Less than 1 year	Younger than 5 years	Less than 1 year
28638	36	13	16
13825	13	83	Less than 1 year
40913	7	15	4
30630	35	7	30

Respondent	CareerSat	JobSat \
722	Very satisfied	Very satisfied
28638	Very dissatisfied	Very dissatisfied
13825	Very dissatisfied	Very satisfied
40913	Slightly satisfied	Slightly satisfied
30630	Neither satisfied nor dissatisfied	Very satisfied

Respondent	MgrIdiot	MgrMoney	MgrWant \
722	NaN	NaN	NaN
28638	NaN	NaN	NaN
13825	NaN	NaN	NaN
40913	Very confident	Not sure	Not sure
30630	NaN	NaN	NaN

Respondent	JobSeek \
722	I am not interested in new job opportunities
28638	I am not interested in new job opportunities
13825	I am actively looking for a job
40913	I am not interested in new job opportunities
30630	I am not interested in new job opportunities

Respondent	LastHireDate \
722	NA - I am an independent contractor or self em...
28638	NaN
13825	NA - I am an independent contractor or self em...
40913	Less than a year ago
30630	NA - I am an independent contractor or self em...

LastInt FizzBuzz \

Respondent		
722		NaN No
28638		NaN NaN
13825	Complete a take-home project;Solve a brain-tea...	Yes
40913	Write any code;Write code by hand (e.g., on a ...	No
30630	Interview with people in peer roles;Interview ...	No

JobFactors \

Respondent	
722	NaN
28638	NaN
13825	Financial performance or funding status of the...
40913	Industry that I'd be working in;Languages, fra...
30630	Industry that I'd be working in;Office environ...

ResumeUpdate CurrencySymbol \

Respondent		
722	I heard about a job opportunity (from a recrui...	AFN
28638		NaN AFN
13825	Something else changed (education, award, medi...	AFN
40913	Something else changed (education, award, medi...	AMD
30630	I heard about a job opportunity (from a recrui...	AUD

Respondent	CurrencyDesc	CompTotal	CompFreq	SalaryUSD	WorkWeekHrs
722	Afghan afghani	1.0	Yearly	0.0	1.0
28638	Afghan afghani	3.0	Monthly	0.0	2.0
13825	Afghan afghani	1.0	Yearly	0.0	168.0
40913	Armenian dram	0.0	Monthly	0.0	40.0
30630	Australian dollar	0.0	Yearly	0.0	80.0

WorkPlan \

Respondent	
722	NaN
28638	NaN
13825	NaN
40913	There's no schedule or spec; I work on what se...
30630	There's no schedule or spec; I work on what se...

WorkChallenge \

Respondent	
722	NaN
28638	NaN
13825	Being tasked with non-development work;Non-wor...
40913	Meetings;Non-work commitments (parenting, scho...
30630	Distracting work environment;Non-work commitme...

	WorkRemote \
Respondent	
722	Less than once per month / Never
28638	NaN
13825	About half the time
40913	Less than half the time, but at least one day ...
30630	It's complicated

	WorkLoc \
Respondent	
722	Other place, such as a coworking space or cafe
28638	NaN
13825	Home
40913	Office
30630	Other place, such as a coworking space or cafe

	ImpSyn	CodeRev \
Respondent		
722	Far above average	Yes, because I see value in code review
28638	NaN	NaN
13825	Far above average	No
40913	A little above average	Yes, because I see value in code review
30630	A little above average	Yes, because I see value in code review

	CodeRevHrs	UnitTests \
Respondent		
722	1.0	No, and I'm glad we don't
28638	NaN	NaN
13825	NaN	Yes, it's part of our process
40913	3.0	No, and I'm glad we don't
30630	10.0	No, but I think we should

	PurchaseHow \
Respondent	
722	NaN
28638	NaN
13825	NaN
40913	Developers and management have nearly equal in...
30630	NaN

	PurchaseWhat \
Respondent	
722	I have little or no influence
28638	NaN
13825	I have a great deal of influence
40913	I have a great deal of influence
30630	I have a great deal of influence

Respondent	LanguageWorkedWith \
722	NaN
28638	Bash/Shell/PowerShell;C;C++;Java;Objective-C;O...
13825	Other(s):
40913	Bash/Shell/PowerShell;C;C++;Java;JavaScript;Py...
30630	Bash/Shell/PowerShell;HTML/CSS;JavaScript;Ruby

Respondent	LanguageDesireNextYear \
722	NaN
28638	Bash/Shell/PowerShell;C;C++;Java;Objective-C;O...
13825	Other(s):
40913	C;C++;Java;Python;SQL;TypeScript
30630	Elixir;Ruby;TypeScript

Respondent	DatabaseWorkedWith	DatabaseDesireNextYear \
722	NaN	NaN
28638	MySQL;SQLite	MySQL;SQLite
13825	Other(s):	Other(s):
40913	Elasticsearch;MariaDB;MongoDB;MySQL;Redis	MariaDB;MongoDB;MySQL
30630	PostgreSQL	PostgreSQL

Respondent	PlatformWorkedWith \
722	NaN
28638	Android;iOS;Linux;MacOS
13825	Other(s):
40913	Arduino;AWS;Docker;Linux;MacOS;Raspberry Pi;Sl...
30630	AWS;iOS

Respondent	PlatformDesireNextYear	WebFrameWorkedWith \
722	NaN	NaN
28638	Android;iOS;Linux	jQuery
13825	Other(s):	Other(s):
40913	Arduino;Linux;MacOS;Raspberry Pi	ASP.NET;Django;Flask
30630	Android;AWS;iOS	Ruby on Rails;Vue.js

Respondent	WebFrameDesireNextYear	MiscTechWorkedWith \
722	NaN	NaN
28638	NaN	TensorFlow;Unity 3D
13825	Other(s):	Other(s):
40913	Django;Flask	.NET;Node.js;TensorFlow;Torch/PyTorch

30630	Ruby on Rails;Vue.js	Chef;React Native
-------	----------------------	-------------------

MiscTechDesireNextYear \

Respondent

722	NaN
28638	Hadoop;TensorFlow;Unity 3D
13825	Other(s):
40913	Node.js
30630	React Native

DevEnviron OpSys \

Respondent

722	NaN	NaN
28638	Emacs	Linux-based
13825	NaN	NaN
40913	IntelliJ;IPython / Jupyter;Sublime Text;Vim	Linux-based
30630	Sublime Text;TextMate;Vim;Xcode	MacOS

Containers BlockchainOrg \

Respondent

722	NaN	NaN
28638	I do not use containers	NaN
13825	I do not use containers	NaN
40913	Production	Not at all
30630	I do not use containers	Not at all

BlockchainIs BetterLife \

Respondent

722	NaN	No
28638	Useful for immutable record keeping outside of...	No
13825	An irresponsible use of resources	No
40913	A passing fad	No
30630	An irresponsible use of resources	Yes

ITperson OffOn SocialMedia \

Respondent

722	SIGH	What?	NaN
28638	Yes	No	NaN
13825	Yes	Yes	NaN
40913	SIGH	Yes	Facebook
30630	Fortunately, someone else has that title	No	Reddit

Extraversion ScreenName SOVisit1st \

Respondent

722	Neither	NaN	2008
28638	In real life (in person)	Username	2008
13825	Neither	NaN	2015

40913	In real life (in person)	Username	2013
30630	Online	Username	I don't remember

SOVisitFreq \

Respondent	
722	Multiple times per day
28638	Daily or almost daily
13825	A few times per month or weekly
40913	Multiple times per day
30630	A few times per month or weekly

SOVisitTo \

Respondent	
722	NaN
28638	Find answers to specific questions
13825	Find answers to specific questions
40913	Find answers to specific questions;Learn how t...
30630	Find answers to specific questions

SOFindAnswer

SOTimeSaved \

Respondent	SOFindAnswer	SOTimeSaved
722	More than 10 times per week	The other resource was much faster
28638	6-10 times per week	The other resource was much faster
13825	1-2 times per week	They were about the same
40913	3-5 times per week	Stack Overflow was much faster
30630	1-2 times per week	They were about the same

SOHowMuchTime

SOAccount \

Respondent	SOHowMuchTime	SOAccount
722	60+ minutes	Not sure / can't remember
28638	11-30 minutes	Yes
13825	NaN	Yes
40913	0-10 minutes	Yes
30630	NaN	Yes

SOPartFreq \

Respondent	
722	NaN
28638	Less than once per month or monthly
13825	I have never participated in Q&A on Stack Over...
40913	Less than once per month or monthly
30630	Less than once per month or monthly

SOJobs \

Respondent	
722	Yes
28638	Yes

13825	No, I knew that Stack Overflow had a job board...
40913	No, I knew that Stack Overflow had a job board...
30630	No, I knew that Stack Overflow had a job board...

	EntTeams	SOCComm \
Respondent		
722	Yes	Not sure
28638	No, I've heard of them, but I am not part of a...	No, not at all
13825	No, and I don't know what those are	No, not at all
40913	No, I've heard of them, but I am not part of a...	No, not really
30630	No, and I don't know what those are	No, not really

	WelcomeChange \
Respondent	
722	Not applicable - I did not use Stack Overflow ...
28638	A lot less welcome now than last year
13825	A lot less welcome now than last year
40913	Just as welcome now as I felt last year
30630	A lot less welcome now than last year

	SONewContent	Age	Gender	Trans \
Respondent				
722	NaN	1.0	NaN	NaN
28638	NaN	NaN	NaN	NaN
13825	NaN	56.0	NaN	NaN
40913	Tech articles written by other developers	22.0	Man	No
30630	NaN	43.0	NaN	No

	Sexuality	Ethnicity	Dependents \
Respondent			
722	NaN	NaN	NaN
28638	NaN	NaN	NaN
13825	NaN	NaN	Yes
40913	Straight / Heterosexual	NaN	No
30630	NaN	NaN	No

	SurveyLength	SurveyEase
Respondent		
722	Too long	Difficult
28638	Too long	NaN
13825	Too short	Easy
40913	Appropriate in length	Easy
30630	Appropriate in length	Easy

```
[216]: df.nlargest(5, 'SalaryUSD')
```

[216]:

Respondent	MainBranch	Hobbyist \
25983	I am a developer by profession	True
87896	I am a developer by profession	True
22013	I am a developer by profession	True
28243	I am a developer by profession	True
72732	I am not primarily a developer, but I write co...	False

Respondent	OpenSourcer \
25983	Less than once per year
87896	Less than once per year
22013	Never
28243	Once a month or more often
72732	Less than once a month but more than once per ...

Respondent	OpenSource \
25983	OSS is, on average, of HIGHER quality than pro...
87896	The quality of OSS and closed source software ...
22013	The quality of OSS and closed source software ...
28243	OSS is, on average, of HIGHER quality than pro...
72732	OSS is, on average, of LOWER quality than prop...

Respondent	Employment	Country \
25983	Employed full-time	Canada
87896	Employed full-time	Germany
22013	Employed full-time	India
28243	Independent contractor, freelancer, or self-em...	India
72732	NaN	India

Respondent	Student	EdLevel \
25983	No	Bachelor's degree (BA, BS, B.Eng., etc.)
87896	No	Bachelor's degree (BA, BS, B.Eng., etc.)
22013	No	Professional degree (JD, MD, etc.)
28243	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
72732	Yes, full-time	Bachelor's degree (BA, BS, B.Eng., etc.)

Respondent	UndergradMajor \
25983	Computer science, computer engineering, or sof...
87896	Computer science, computer engineering, or sof...
22013	A natural science (ex. biology, chemistry, phy...
28243	Computer science, computer engineering, or sof...
72732	Computer science, computer engineering, or sof...

	EduOther \
Respondent	
25983	Received on-the-job training in software devel...
87896	Taken an online course in programming or softw...
22013	Taken an online course in programming or softw...
28243	Taken an online course in programming or softw...
72732	Contributed to open source software

	OrgSize \
Respondent	
25983	10,000 or more employees
87896	2-9 employees
22013	2-9 employees
28243	2-9 employees
72732	NaN

	DevType	YearsCode \
Respondent		
25983	Developer, full-stack	8
87896	Developer, full-stack	9
22013	Academic researcher;Data scientist or machine ...	3
28243	Developer, back-end;Developer, full-stack;Deve...	25
72732	NaN	4

	Age1stCode	YearsCodePro	CareerSat \
Respondent			
25983	16	2	Very satisfied
87896	17	8	Very satisfied
22013	26	3	Very satisfied
28243	9	14	Neither satisfied nor dissatisfied
72732	20	5	Slightly satisfied

	JobSat	MgrIdiot	MgrMoney \
Respondent			
25983	Very satisfied	Somewhat confident	No
87896	Very satisfied	Somewhat confident	No
22013	Very satisfied	NaN	NaN
28243	Neither satisfied nor dissatisfied	NaN	NaN
72732	Slightly satisfied	NaN	NaN

	MgrWant \
Respondent	
25983	No
87896	I am already a manager
22013	NaN
28243	NaN

72732

NaN

JobSeek \

Respondent

25983	I'm not actively looking, but I am open to new...
87896	I am not interested in new job opportunities
22013	I am not interested in new job opportunities
28243	I'm not actively looking, but I am open to new...
72732	I am actively looking for a job

LastHireDate \

Respondent

25983	3-4 years ago
87896	More than 4 years ago
22013	3-4 years ago
28243	1-2 years ago
72732	More than 4 years ago

LastInt FizzBuzz \

Respondent

25983	Solve a brain-teaser style puzzle;Interview wi...	No
87896	Write any code;Interview with people in senior...	No
22013	Write code by hand (e.g., on a whiteboard);Com...	No
28243	Interview with people in peer roles;Interview ...	Yes
72732	Write any code	No

JobFactors \

Respondent

25983	Remote work options;Opportunities for professi...
87896	Office environment or company culture;Diversit...
22013	Financial performance or funding status of the...
28243	Financial performance or funding status of the...
72732	Remote work options;Opportunities for professi...

ResumeUpdate CurrencySymbol \

Respondent

25983	My job status changed (promotion, new job, etc.)	USD
87896	Something else changed (education, award, medi...	USD
22013	Something else changed (education, award, medi...	USD
28243	I heard about a job opportunity (from a recrui...	USD
72732	I was preparing for a job search	USD

CurrencyDesc CompTotal CompFreq SalaryUSD WorkWeekHrs \

Respondent

25983	United States dollar	65500.0	Weekly	2000000.0	45.0
87896	United States dollar	55000.0	Weekly	2000000.0	40.0
22013	United States dollar	1500000.0	Weekly	2000000.0	50.0

28243	United States dollar	2000000.0	Yearly	2000000.0	20.0
72732	United States dollar	80000.0	Weekly	2000000.0	40.0

WorkPlan \

Respondent

25983	There is a schedule and/or spec (made by me or...
87896	There is a schedule and/or spec (made by me or...
22013	There's no schedule or spec; I work on what se...
28243	There is a schedule and/or spec (made by me or...
72732	There is a schedule and/or spec (made by me or...

WorkChallenge \

Respondent

25983	Being tasked with non-development work;Meeting...
87896	Being tasked with non-development work;Meeting...
22013	Inadequate access to necessary tools;Meetings;...
28243	Being tasked with non-development work;Not eno...
72732	Lack of support from management;Meetings;Time ...

WorkRemote WorkLoc \

Respondent

25983	A few days each month	Office
87896	All or almost all the time (I'm full-time remote)	Home
22013	All or almost all the time (I'm full-time remote)	Home
28243	All or almost all the time (I'm full-time remote)	Office
72732	Less than once per month / Never	Office

ImpSyn

CodeRev \

Respondent

25983	Average	Yes, because I see value in code review
87896	A little above average	Yes, because I see value in code review
22013	A little below average	Yes, because I see value in code review
28243	Far above average	Yes, because I see value in code review
72732	A little above average	Yes, because I see value in code review

CodeRevHrs

UnitTests \

Respondent

25983	2.0	Yes, it's part of our process
87896	3.0	No, but I think we should
22013	10.0	Yes, it's part of our process
28243	NaN	NaN
72732	10.0	Yes, it's part of our process

PurchaseHow \

Respondent

25983	Developers and management have nearly equal in...
87896	Developers and management have nearly equal in...

22013	Developers typically have the most influence o...
28243	NaN
72732	Not sure

	PurchaseWhat \
Respondent	
25983	I have little or no influence
87896	I have a great deal of influence
22013	I have a great deal of influence
28243	NaN
72732	I have little or no influence

	LanguageWorkedWith \
Respondent	
25983	Bash/Shell/PowerShell;C++;C#;HTML/CSS;JavaScri...
87896	HTML/CSS;JavaScript;PHP;SQL
22013	Assembly;Bash/Shell/PowerShell;C;C++;Java;Java...
28243	C++;C#;Java;JavaScript;Objective-C;Python
72732	Java;Python;SQL

	LanguageDesireNextYear \
Respondent	
25983	Bash/Shell/PowerShell;C#;F#;Python;SQL;TypeScript
87896	HTML/CSS;JavaScript;PHP;Ruby;SQL;TypeScript
22013	Python;Swift
28243	C;C++;C#
72732	NaN

	DatabaseWorkedWith \
Respondent	
25983	Microsoft SQL Server;MySQL
87896	MariaDB;MySQL;PostgreSQL
22013	Cassandra;Microsoft SQL Server;Oracle
28243	PostgreSQL;SQLite
72732	MongoDB;Microsoft SQL Server;MySQL;Oracle;Post...

	DatabaseDesireNextYear \
Respondent	
25983	Microsoft SQL Server;MySQL
87896	MariaDB;MySQL;PostgreSQL
22013	Cassandra
28243	SQLite
72732	MySQL

	PlatformWorkedWith \
Respondent	
25983	AWS;Docker;Heroku;Linux;MacOS;Raspberry Pi;Win...

87896	WordPress
22013	Android;Arduino;Google Cloud Platform;IBM Clou...
28243	Android;AWS;iOS;MacOS;Windows
72732	Android;Windows

	PlatformDesireNextYear	WebFrameWorkedWith \
Respondent		
25983	AWS;Docker;Linux;MacOS;Windows	Angular/Angular.js
87896	NaN	jQuery;Laravel;Vue.js
22013	IBM Cloud or Watson;Windows	jQuery
28243	Android;Linux	NaN
72732	AWS;Docker	NaN

	WebFrameDesireNextYear	MiscTechWorkedWith \
Respondent		
25983	Angular/Angular.js;Flask;React.js	.NET;.NET Core;Node.js
87896	Express;Laravel;Ruby on Rails;Vue.js	NaN
22013	NaN	TensorFlow
28243	NaN	Node.js;Pandas;Unity 3D
72732	Angular/Angular.js;React.js	NaN

	MiscTechDesireNextYear \
Respondent	
25983	.NET Core;Node.js
87896	Node.js
22013	TensorFlow
28243	Unity 3D;Unreal Engine
72732	NaN

	DevEnviron	OpSys \
Respondent		
25983	Notepad++;Sublime Text;Vim;Visual Studio;Visua...	Windows
87896	Sublime Text;Vim;Visual Studio Code	Linux-based
22013	Visual Studio;Visual Studio Code	Windows
28243	Android Studio;Coda;PyCharm;Visual Studio;Visu...	MacOS
72732	Eclipse;Notepad++;PyCharm	Windows

	Containers	BlockchainOrg \
Respondent		
25983	Development;Production	NaN
87896	I do not use containers	Not at all
22013	Development	Implementing our own cryptocurrency
28243	I do not use containers	NaN
72732	Testing	NaN

	BlockchainIs BetterLife \
Respondent	

25983	Useful for decentralized currency (i.e., Bitcoin)	No
87896	Useful for immutable record keeping outside of...	No
22013	Useful across many domains and could change ma...	Yes
28243	An irresponsible use of resources	No
72732	NaN	Yes

Respondent	ITperson	OffOn	SocialMedia	Extraversion \
25983	Yes	Yes	Reddit	In real life (in person)
87896	Yes	Yes	Twitter	Online
22013	Yes	No	YouTube	Online
28243	Yes	No	I don't use social media	In real life (in person)
72732	Yes	No	WhatsApp	Neither

Respondent	ScreenName	SOVisit1st	SOVisitFreq \
25983	Username	2013	Daily or almost daily
87896	Handle	2011	Daily or almost daily
22013	Screen Name	NaN	A few times per week
28243	Username	2008	Daily or almost daily
72732	NaN	2017	A few times per month or weekly

Respondent	SOVisitTo \
25983	Find answers to specific questions;Learn how t...
87896	Find answers to specific questions
22013	Find answers to specific questions
28243	Find answers to specific questions
72732	Get a sense of belonging to the developer comm...

Respondent	SOFindAnswer	SOTimeSaved \
25983	1-2 times per week	Stack Overflow was much faster
87896	3-5 times per week	Stack Overflow was much faster
22013	1-2 times per week	Stack Overflow was much faster
28243	More than 10 times per week	Stack Overflow was much faster
72732	1-2 times per week	Stack Overflow was slightly faster

Respondent	SOHowMuchTime	SOAccount \
25983	11-30 minutes	Yes
87896	0-10 minutes	Yes
22013	60+ minutes	Yes
28243	60+ minutes	Yes
72732	11-30 minutes	Yes

SOPartFreq \

Respondent	
25983	Less than once per month or monthly
87896	Less than once per month or monthly
22013	I have never participated in Q&A on Stack Over...
28243	Multiple times per day
72732	A few times per month or weekly

SOJobs \

Respondent	
25983	No, I knew that Stack Overflow had a job board...
87896	No, I knew that Stack Overflow had a job board...
22013	Yes
28243	Yes
72732	Yes

EntTeams \

Respondent	
25983	No, and I don't know what those are
87896	No, I've heard of them, but I am not part of a...
22013	Yes
28243	No, and I don't know what those are
72732	No, and I don't know what those are

SOComm WelcomeChange \

Respondent		
25983	No, not really	Just as welcome now as I felt last year
87896	No, not really	Just as welcome now as I felt last year
22013	Yes, definitely	A lot more welcome now than last year
28243	Yes, definitely	A lot less welcome now than last year
72732	Not sure	A lot less welcome now than last year

SONewContent Age Gender \

Respondent			
25983		NaN	24.0 Man
87896	Tech articles written by other developers;Tech...	32.0	Man
22013	Tech articles written by other developers;Indu...	NaN	Man
28243	Tech meetups or events in your area	NaN	NaN
72732	Tech articles written by other developers;Tech...	NaN	Man

Trans Sexuality Ethnicity \

Respondent			
25983	No	Straight / Heterosexual	White or of European descent
87896	No	Gay or Lesbian	White or of European descent
22013	No	Straight / Heterosexual	NaN
28243	NaN	Straight / Heterosexual	NaN
72732	No	NaN	NaN

Respondent	Dependents	SurveyLength	SurveyEase
25983	No	Appropriate in length	Easy
87896	No	Appropriate in length	Neither easy nor difficult
22013	Yes	Too long	Easy
28243	Yes	Too short	Easy
72732	Yes	Too long	Easy

```
[217]: df['SalaryUSD'].head(10)
```

```
[217]: Respondent
63129    1000000.0
50499    153216.0
39258    19152.0
58450    17556.0
7085     14364.0
22450     7980.0
48436     4464.0
10746     3996.0
8149      1596.0
29736     1116.0
Name: SalaryUSD, dtype: float64
```

```
[218]: df['SalaryUSD'].mean()
```

```
[218]: 127110.73842323056
```

```
[219]: df['SalaryUSD'].median()
```

```
[219]: 57287.0
```

```
[220]: df.median()
```

```
[220]: Hobbyist          1.0
CompTotal          62000.0
SalaryUSD          57287.0
WorkWeekHrs        40.0
CodeRevHrs          4.0
Age                29.0
dtype: float64
```

```
[221]: df.describe()
```

```
[221]:
```

	CompTotal	SalaryUSD	WorkWeekHrs	CodeRevHrs	Age
count	5.594500e+04	5.582300e+04	64503.000000	49790.000000	79210.000000
mean	5.519014e+11	1.271107e+05	42.127197	5.084308	30.336699
std	7.331926e+13	2.841523e+05	37.287610	5.513931	9.178390
min	0.000000e+00	0.000000e+00	1.000000	0.000000	1.000000

25%	2.000000e+04	2.577750e+04	40.000000	2.000000	24.000000
50%	6.200000e+04	5.728700e+04	40.000000	4.000000	29.000000
75%	1.200000e+05	1.000000e+05	44.750000	6.000000	35.000000
max	1.000000e+16	2.000000e+06	4850.000000	99.000000	99.000000

```
[222]: df['SalaryUSD'].count()
```

```
[222]: 55823
```

```
[223]: df['SocialMedia']
```

```
[223]: Respondent
63129    I don't use social media
50499                                WhatsApp
39258                                Facebook
58450                                Facebook
7085                                 Instagram
...
88062                                NaN
88076                                NaN
88601                                NaN
88802                                NaN
88816                                NaN
Name: SocialMedia, Length: 88883, dtype: object
```

```
[224]: schema_df.loc['SocialMedia']
```

```
[224]: QuestionText    What social media site do you use the most?
Name: SocialMedia, dtype: object
```

```
[225]: df['SocialMedia'].value_counts()
```

```
[225]: Reddit                14374
YouTube                  13830
WhatsApp                 13347
Facebook                 13178
Twitter                  11398
Instagram                 6261
I don't use social media  5554
LinkedIn                  4501
WeChat                    667
Snapchat                  628
VK                         603
Weibo                      56
Youku Tudou                 21
Hello                       19
Name: SocialMedia, dtype: int64
```



```
[226]: df['SocialMedia'].value_counts(normalize= True)
```

```
[226]: Reddit                0.170233
      YouTube              0.163791
      WhatsApp            0.158071
      Facebook            0.156069
      Twitter             0.134988
      Instagram           0.074150
      I don't use social media 0.065777
      LinkedIn            0.053306
      WeChat              0.007899
      Snapchat            0.007437
      VK                  0.007141
      Weibo               0.000663
      Youku Tudou         0.000249
      Hello               0.000225
      Name: SocialMedia, dtype: float64
```

```
[227]: df['Country'].value_counts()
```

```
[227]: United States        20949
      India                9061
      Germany             5866
      United Kingdom      5737
      Canada              3395
      ...
      Saint Kitts and Nevis 1
      Chad                1
      Timor-Leste         1
      Dominica            1
      Tonga               1
      Name: Country, Length: 179, dtype: int64
```

```
[228]: Country_grp=df.groupby('Country')
```

```
[229]: Country_grp.get_group('India')
```

```
[229]:
```

	MainBranch	Hobbyist	\
Respondent			
22013	I am a developer by profession	True	
28243	I am a developer by profession	True	
72732	I am not primarily a developer, but I write co...	False	
16793	I am a developer by profession	True	
52561	I am a developer by profession	True	
...	
88829	I am a student who is learning to code	True	
88843	I am a developer by profession	True	

88856	I am a developer by profession	True
88869	I am a developer by profession	False
88872	I am a developer by profession	True

OpenSourcer \

Respondent

22013	Never
28243	Once a month or more often
72732	Less than once a month but more than once per ...
16793	Once a month or more often
52561	Never
...	...
88829	Once a month or more often
88843	Never
88856	Never
88869	Never
88872	Less than once a month but more than once per ...

OpenSource \

Respondent

22013	The quality of OSS and closed source software ...
28243	OSS is, on average, of HIGHER quality than pro...
72732	OSS is, on average, of LOWER quality than prop...
16793	OSS is, on average, of HIGHER quality than pro...
52561	OSS is, on average, of LOWER quality than prop...
...	...
88829	OSS is, on average, of HIGHER quality than pro...
88843	OSS is, on average, of HIGHER quality than pro...
88856	OSS is, on average, of HIGHER quality than pro...
88869	OSS is, on average, of LOWER quality than prop...
88872	OSS is, on average, of HIGHER quality than pro...

Employment Country \

Respondent

22013	Employed full-time	India
28243	Independent contractor, freelancer, or self-em...	India
72732	NaN	India
16793	Independent contractor, freelancer, or self-em...	India
52561	Employed full-time	India
...
88829	Not employed, but looking for work	India
88843	Employed full-time	India
88856	Employed full-time	India
88869	Employed full-time	India
88872	Employed full-time	India

Student

EdLevel \

Respondent		
22013	No	Professional degree (JD, MD, etc.)
28243	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
72732	Yes, full-time	Bachelor's degree (BA, BS, B.Eng., etc.)
16793	No	Bachelor's degree (BA, BS, B.Eng., etc.)
52561	No	Master's degree (MA, MS, M.Eng., MBA, etc.)
...
88829	Yes, full-time	Secondary school (e.g. American high school, G...
88843	No	Bachelor's degree (BA, BS, B.Eng., etc.)
88856	Yes, full-time	Master's degree (MA, MS, M.Eng., MBA, etc.)
88869	NaN	NaN
88872	No	Bachelor's degree (BA, BS, B.Eng., etc.)

UndergradMajor \

Respondent	
22013	A natural science (ex. biology, chemistry, phy...
28243	Computer science, computer engineering, or sof...
72732	Computer science, computer engineering, or sof...
16793	Computer science, computer engineering, or sof...
52561	Computer science, computer engineering, or sof...
...	...
88829	NaN
88843	Computer science, computer engineering, or sof...
88856	Web development or web design
88869	NaN
88872	Computer science, computer engineering, or sof...

EduOther \

Respondent	
22013	Taken an online course in programming or softw...
28243	Taken an online course in programming or softw...
72732	Contributed to open source software
16793	Taken an online course in programming or softw...
52561	Taken an online course in programming or softw...
...	...
88829	Taught yourself a new language, framework, or ...
88843	Taken an online course in programming or softw...
88856	Participated in online coding competitions (e...
88869	NaN
88872	Taken an online course in programming or softw...

OrgSize \

Respondent	
22013	2-9 employees
28243	2-9 employees
72732	NaN
16793	Just me - I am a freelancer, sole proprietor, ...

52561	5,000 to 9,999 employees
...	...
88829	NaN
88843	20 to 99 employees
88856	5,000 to 9,999 employees
88869	NaN
88872	100 to 499 employees

	DevType	YearsCode	\
Respondent			
22013	Academic researcher;Data scientist or machine ...	3	
28243	Developer, back-end;Developer, full-stack;Deve...	25	
72732	NaN	4	
16793	Academic researcher;Data or business analyst;D...	14	
52561	Developer, back-end;Developer, desktop or ente...	12	
...	
88829	Developer, full-stack;Student	3	
88843	Developer, back-end;Developer, front-end;Devel...	9	
88856	Designer	5	
88869	NaN	NaN	
88872	Developer, back-end;DevOps specialist	7	

	Age1stCode	YearsCodePro	CareerSat	\
Respondent				
22013	26	3	Very satisfied	
28243	9	14	Neither satisfied nor dissatisfied	
72732	20	5	Slightly satisfied	
16793	14	6	Neither satisfied nor dissatisfied	
52561	11	9	Slightly satisfied	
...	
88829	17	NaN	NaN	
88843	13	2	Very satisfied	
88856	5	2	Neither satisfied nor dissatisfied	
88869	NaN	NaN	Very dissatisfied	
88872	17	4	Slightly satisfied	

	JobSat	MgrIdiot	MgrMoney	\
Respondent				
22013	Very satisfied	NaN	NaN	
28243	Neither satisfied nor dissatisfied	NaN	NaN	
72732	Slightly satisfied	NaN	NaN	
16793	Neither satisfied nor dissatisfied	NaN	NaN	
52561	Slightly satisfied	Somewhat confident	No	
...	
88829	NaN	NaN	NaN	
88843	Neither satisfied nor dissatisfied	Very confident	Not sure	
88856	Neither satisfied nor dissatisfied	Very confident	NaN	

88869	Very dissatisfied	Very confident	Yes
88872	Slightly satisfied	Somewhat confident	No

	MgrWant		JobSeek \
Respondent			
22013	NaN	I am not interested in new job opportunities	
28243	NaN	I'm not actively looking, but I am open to new...	
72732	NaN	I am actively looking for a job	
16793	NaN	I am actively looking for a job	
52561	No	I'm not actively looking, but I am open to new...	
...
88829	NaN	I am actively looking for a job	
88843	Yes	I'm not actively looking, but I am open to new...	
88856	Yes	I'm not actively looking, but I am open to new...	
88869	Yes	I'm not actively looking, but I am open to new...	
88872	Not sure	I'm not actively looking, but I am open to new...	

	LastHireDate \
Respondent	
22013	3-4 years ago
28243	1-2 years ago
72732	More than 4 years ago
16793	1-2 years ago
52561	3-4 years ago
...	...
88829	I've never had a job
88843	1-2 years ago
88856	3-4 years ago
88869	Less than a year ago
88872	3-4 years ago

		LastInt FizzBuzz \
Respondent		
22013	Write code by hand (e.g., on a whiteboard);Com...	No
28243	Interview with people in peer roles;Interview ...	Yes
72732	Write any code	No
16793	Write any code;Write code by hand (e.g., on a ...	Yes
52561	Write any code;Write code by hand (e.g., on a ...	No
...
88829	NaN	NaN
88843	Write any code;Solve a brain-teaser style puzz...	No
88856	Write any code;Write code by hand (e.g., on a ...	No
88869	Write any code;Write code by hand (e.g., on a ...	No
88872	Write code by hand (e.g., on a whiteboard);Sol...	No

	JobFactors \
Respondent	

22013	Financial performance or funding status of the...
28243	Financial performance or funding status of the...
72732	Remote work options;Opportunities for professi...
16793	Office environment or company culture;Opportun...
52561	Languages, frameworks, and other technologies ...
...	...
88829	Office environment or company culture;Opportun...
88843	Industry that I'd be working in;Languages, fra...
88856	Specific department or team I'd be working on;...
88869	Remote work options;Opportunities for professi...
88872	Languages, frameworks, and other technologies ...

	ResumeUpdate	CurrencySymbol	\
Respondent			
22013	Something else changed (education, award, medi...	USD	
28243	I heard about a job opportunity (from a recrui...	USD	
72732	I was preparing for a job search	USD	
16793	I heard about a job opportunity (from a recrui...	INR	
52561	Something else changed (education, award, medi...	INR	
...	
88829	I was preparing for a job search	NaN	
88843	I was preparing for a job search	INR	
88856	I heard about a job opportunity (from a recrui...	AOA	
88869	I heard about a job opportunity (from a recrui...	INR	
88872	I was preparing for a job search	INR	

	CurrencyDesc	CompTotal	CompFreq	SalaryUSD	\
Respondent					
22013	United States dollar	1500000.0	Weekly	2000000.0	
28243	United States dollar	2000000.0	Yearly	2000000.0	
72732	United States dollar	80000.0	Weekly	2000000.0	
16793	Indian rupee	106673250.0	Yearly	1000000.0	
52561	Indian rupee	2000000.0	Weekly	1000000.0	
...	
88829	NaN	NaN	NaN	NaN	
88843	Indian rupee	NaN	Monthly	NaN	
88856	Angolan kwanza	NaN	Weekly	NaN	
88869	Indian rupee	NaN	NaN	NaN	
88872	Indian rupee	NaN	NaN	NaN	

	WorkWeekHrs	WorkPlan	\
Respondent			
22013	50.0	There's no schedule or spec; I work on what se...	
28243	20.0	There is a schedule and/or spec (made by me or...	
72732	40.0	There is a schedule and/or spec (made by me or...	
16793	50.0	There is a schedule and/or spec (made by me or...	
52561	40.0	There's no schedule or spec; I work on what se...	

...
88829	NaN	NaN
88843	40.0	There is a schedule and/or spec (made by me or...
88856	NaN	NaN
88869	NaN	NaN
88872	NaN	There's no schedule or spec; I work on what se...

WorkChallenge \

Respondent

22013	Inadequate access to necessary tools;Meetings;...
28243	Being tasked with non-development work;Not eno...
72732	Lack of support from management;Meetings;Time ...
16793	Distracting work environment;Non-work commitme...
52561	Being tasked with non-development work;Distrac...

...	...
88829	NaN
88843	Being tasked with non-development work;Non-wor...
88856	NaN
88869	Being tasked with non-development work;Distrac...
88872	Being tasked with non-development work;Meeting...

WorkRemote WorkLoc \

Respondent

22013	All or almost all the time (I'm full-time remote)	Home
28243	All or almost all the time (I'm full-time remote)	Office
72732	Less than once per month / Never	Office
16793	It's complicated	Office
52561	A few days each month	Office

...
88829	NaN	NaN
88843	Less than once per month / Never	Home
88856	NaN	NaN
88869	All or almost all the time (I'm full-time remote)	Home
88872	NaN	Office

ImpSyn

CodeRev \

Respondent

22013	A little below average	Yes, because I see value in code review
28243	Far above average	Yes, because I see value in code review
72732	A little above average	Yes, because I see value in code review
16793	Far above average	Yes, because I see value in code review
52561	A little above average	Yes, because I was told to do so
...
88829	NaN	NaN
88843	A little above average	Yes, because I see value in code review
88856	NaN	NaN
88869	A little below average	Yes, because I see value in code review

88872 A little above average Yes, because I see value in code review

	CodeRevHrs	UnitTests \
Respondent		
22013	10.0	Yes, it's part of our process
28243	NaN	NaN
72732	10.0	Yes, it's part of our process
16793	20.0	NaN
52561	2.0	Yes, it's part of our process
...
88829	NaN	NaN
88843	NaN	Yes, it's not part of our process but the deve...
88856	NaN	NaN
88869	3.0	Yes, it's part of our process
88872	5.0	Yes, it's part of our process

	PurchaseHow \
Respondent	
22013	Developers typically have the most influence o...
28243	NaN
72732	Not sure
16793	NaN
52561	Developers and management have nearly equal in...
...	...
88829	NaN
88843	Not sure
88856	NaN
88869	NaN
88872	Developers typically have the most influence o...

	PurchaseWhat \
Respondent	
22013	I have a great deal of influence
28243	NaN
72732	I have little or no influence
16793	NaN
52561	I have some influence
...	...
88829	NaN
88843	I have little or no influence
88856	NaN
88869	NaN
88872	I have a great deal of influence

	LanguageWorkedWith \
Respondent	
22013	Assembly;Bash/Shell/PowerShell;C;C++;Java;Java...

28243	C++;C#;Java;JavaScript;Objective-C;Python
72732	Java;Python;SQL
16793	Assembly;Bash/Shell/PowerShell;C;C++;C#;Dart;G...
52561	C#;JavaScript
...	...
88829	Bash/Shell/PowerShell;C;C++;HTML/CSS;JavaScrip...
88843	Bash/Shell/PowerShell;C;C++;HTML/CSS;Java;Java...
88856	HTML/CSS;JavaScript;PHP;TypeScript
88869	HTML/CSS;JavaScript;PHP;SQL
88872	Java;Ruby;SQL

LanguageDesireNextYear \

Respondent

22013	Python;Swift
28243	C;C++;C#
72732	NaN
16793	Bash/Shell/PowerShell;C;C++;Go;HTML/CSS;Java;J...
52561	C#;JavaScript
...	...
88829	Bash/Shell/PowerShell;C;C++;HTML/CSS;JavaScrip...
88843	HTML/CSS;JavaScript;Python;SQL;TypeScript
88856	HTML/CSS;JavaScript;PHP;TypeScript
88869	Kotlin;Python;R
88872	Go;Python;R

DatabaseWorkedWith \

Respondent

22013	Cassandra;Microsoft SQL Server;Oracle
28243	PostgreSQL;SQLite
72732	MongoDB;Microsoft SQL Server;MySQL;Oracle;Post...
16793	Cassandra;Couchbase;DynamoDB;Elasticsearch;Fir...
52561	DynamoDB;Microsoft SQL Server;SQLite
...	...
88829	MySQL;Oracle;PostgreSQL;Redis;SQLite
88843	Microsoft SQL Server;MySQL;PostgreSQL
88856	NaN
88869	MariaDB;MySQL
88872	Cassandra;MongoDB;MySQL

DatabaseDesireNextYear \

Respondent

22013	Cassandra
28243	SQLite
72732	MySQL
16793	Cassandra;Couchbase;DynamoDB;Elasticsearch;Fir...
52561	DynamoDB;Microsoft SQL Server
...	...

88829	Couchbase;Elasticsearch;MySQL;PostgreSQL;Redis...
88843	Elasticsearch;MySQL
88856	NaN
88869	Elasticsearch;Firebase;MongoDB;Redis
88872	PostgreSQL;Redis

PlatformWorkedWith \

Respondent

22013	Android;Arduino;Google Cloud Platform;IBM Clou...
28243	Android;AWS;iOS;MacOS;Windows
72732	Android;Windows
16793	Android;Arduino;AWS;Docker;Google Cloud Platfo...
52561	AWS;Docker;Linux;Windows
...	...
88829	Docker;Linux
88843	NaN
88856	NaN
88869	AWS;Heroku;Windows
88872	Docker;Google Cloud Platform;Linux

PlatformDesireNextYear \

Respondent

22013	IBM Cloud or Watson;Windows
28243	Android;Linux
72732	AWS;Docker
16793	Android;Arduino;AWS;Docker;Google Cloud Platfo...
52561	AWS;Docker;Linux;Windows
...	...
88829	Docker;Linux
88843	NaN
88856	NaN
88869	IBM Cloud or Watson;Kubernetes;Linux
88872	AWS;Docker;Google Cloud Platform;Kubernetes;Linux

WebFrameWorkedWith \

Respondent

22013	jQuery
28243	NaN
72732	NaN
16793	Angular/Angular.js;ASP.NET;Django;Drupal;Expre...
52561	Angular/Angular.js;ASP.NET;Express;React.js
...	...
88829	Django;Express;Flask;jQuery
88843	Angular/Angular.js;Django;Express;jQuery
88856	Angular/Angular.js;ASP.NET
88869	Express;Laravel;React.js;Ruby on Rails
88872	NaN

Respondent	WebFrameDesireNextYear \
22013	NaN
28243	NaN
72732	Angular/Angular.js;React.js
16793	Angular/Angular.js;ASP.NET;Django;Flask;jQuery...
52561	Angular/Angular.js;ASP.NET;Express;React.js
...	...
88829	Angular/Angular.js;Django;Flask;jQuery;React.js
88843	Angular/Angular.js;Django;Express;jQuery;React.js
88856	Angular/Angular.js;ASP.NET
88869	Laravel;React.js;Ruby on Rails
88872	NaN

Respondent	MiscTechWorkedWith \
22013	TensorFlow
28243	Node.js;Pandas;Unity 3D
72732	NaN
16793	Apache Spark;Flutter;Hadoop;.NET;.NET Core;Nod...
52561	.NET;.NET Core;Node.js
...	...
88829	Ansible;Node.js
88843	Node.js
88856	NaN
88869	Node.js
88872	NaN

Respondent	MiscTechDesireNextYear \
22013	TensorFlow
28243	Unity 3D;Unreal Engine
72732	NaN
16793	Apache Spark;Hadoop;Pandas;TensorFlow;Torch/Py...
52561	.NET;.NET Core;Node.js
...	...
88829	Ansible;Puppet;React Native
88843	Node.js
88856	NaN
88869	Hadoop;Node.js;React Native
88872	Chef;Puppet

Respondent	DevEnviron	OpSys \
22013	Visual Studio;Visual Studio Code	Windows
28243	Android Studio;Coda;PyCharm;Visual Studio;Visu...	MacOS

72732	Eclipse;Notepad++;PyCharm	Windows
16793	Android Studio;Atom;Eclipse;Emacs;IntelliJ;IPy...	Linux-based
52561	Visual Studio;Visual Studio Code	Windows
...
88829	Visual Studio Code	Linux-based
88843	IntelliJ;Notepad++;PHPStorm;Visual Studio Code	Windows
88856	Eclipse;Notepad++;PHPStorm;Sublime Text;Visual...	Windows
88869	NetBeans;Notepad++;PHPStorm	Linux-based
88872	IntelliJ;RubyMine;Vim	Linux-based

Containers \

Respondent

22013	Development
28243	I do not use containers
72732	Testing
16793	Development;Testing;Production;Outside of work...
52561	Development;Testing;Production;Outside of work...
...	...
88829	Development;Testing;Production;Outside of work...
88843	I do not use containers
88856	Development
88869	I do not use containers
88872	Development;Production

BlockchainOrg \

Respondent

22013	Implementing our own cryptocurrency
28243	NaN
72732	NaN
16793	NaN
52561	Not at all
...	...
88829	NaN
88843	NaN
88856	Accepting Bitcoin or other coins and tokens as...
88869	Not at all
88872	NaN

BlockchainIs BetterLife \

Respondent

22013	Useful across many domains and could change ma...	Yes
28243	An irresponsible use of resources	No
72732	NaN	Yes
16793	Useful across many domains and could change ma...	Yes
52561	Useful for immutable record keeping outside of...	No
...
88829	NaN	Yes

88843	Useful across many domains and could change ma...	No
88856	Useful across many domains and could change ma...	No
88869	Useful for decentralized currency (i.e., Bitcoin)	No
88872	NaN	Yes

Respondent	ITperson	OffOn	SocialMedia \
22013	Yes	No	YouTube
28243	Yes	No	I don't use social media
72732	Yes	No	WhatsApp
16793	Also Yes	What?	LinkedIn
52561	Also Yes	Yes	YouTube
...
88829	Yes	What?	NaN
88843	Yes	Yes	WhatsApp
88856	Yes	Yes	NaN
88869	SIGH	What?	WhatsApp
88872	Yes	What?	LinkedIn

Respondent	Extraversion	ScreenName	SOVisit1st \
22013	Online	Screen Name	NaN
28243	In real life (in person)	Username	2008
72732	Neither	NaN	2017
16793	Online	Handle	2009
52561	Online	UserID	2009
...
88829	Online	Username	2016
88843	In real life (in person)	UserID	2013
88856	NaN	NaN	2011
88869	Online	UserID	2011
88872	In real life (in person)	Username	2011

Respondent	SOVisitFreq \
22013	A few times per week
28243	Daily or almost daily
72732	A few times per month or weekly
16793	Multiple times per day
52561	Daily or almost daily
...	...
88829	A few times per week
88843	Daily or almost daily
88856	I have never visited Stack Overflow (before to...
88869	Multiple times per day
88872	A few times per week

SOVisitTo \

Respondent

22013	Find answers to specific questions
28243	Find answers to specific questions
72732	Get a sense of belonging to the developer comm...
16793	Find answers to specific questions;Learn how t...
52561	Find answers to specific questions;Contribute ...
...	...
88829	Find answers to specific questions
88843	Find answers to specific questions;Learn how t...
88856	Find answers to specific questions;Learn how t...
88869	Find answers to specific questions;Learn how t...
88872	Find answers to specific questions;Contribute ...

SOFindAnswer

SOTimeSaved \

Respondent

22013	1-2 times per week	Stack Overflow was much faster
28243	More than 10 times per week	Stack Overflow was much faster
72732	1-2 times per week	Stack Overflow was slightly faster
16793	More than 10 times per week	Stack Overflow was much faster
52561	1-2 times per week	Stack Overflow was much faster
...
88829	6-10 times per week	Stack Overflow was much faster
88843	1-2 times per week	Stack Overflow was slightly faster
88856	3-5 times per week	NaN
88869	1-2 times per week	They were about the same
88872	Less than once per week	Stack Overflow was much faster

SOHowMuchTime SOAccount \

Respondent

22013	60+ minutes	Yes
28243	60+ minutes	Yes
72732	11-30 minutes	Yes
16793	0-10 minutes	Yes
52561	0-10 minutes	Yes
...
88829	31-60 minutes	Yes
88843	0-10 minutes	Yes
88856	31-60 minutes	NaN
88869	NaN	Yes
88872	0-10 minutes	Yes

SOPartFreq \

Respondent

22013	I have never participated in Q&A on Stack Over...
28243	Multiple times per day
72732	A few times per month or weekly

16793	A few times per week
52561	A few times per month or weekly
...	...
88829	Less than once per month or monthly
88843	Less than once per month or monthly
88856	NaN
88869	Less than once per month or monthly
88872	A few times per month or weekly

SOJobs \

Respondent

22013	Yes
28243	Yes
72732	Yes
16793	No, I didn't know that Stack Overflow had a jo...
52561	Yes
...	...
88829	No, I knew that Stack Overflow had a job board...
88843	No, I knew that Stack Overflow had a job board...
88856	No, I knew that Stack Overflow had a job board...
88869	Yes
88872	No, I knew that Stack Overflow had a job board...

EntTeams \

Respondent

22013	Yes
28243	No, and I don't know what those are
72732	No, and I don't know what those are
16793	No, and I don't know what those are
52561	No, I've heard of them, but I am not part of a...
...	...
88829	No, and I don't know what those are
88843	No, I've heard of them, but I am not part of a...
88856	No, I've heard of them, but I am not part of a...
88869	No, and I don't know what those are
88872	No, I've heard of them, but I am not part of a...

SOComm

WelcomeChange \

Respondent

22013	Yes, definitely	A lot more welcome now than last year
28243	Yes, definitely	A lot less welcome now than last year
72732	Not sure	A lot less welcome now than last year
16793	Yes, definitely	Somewhat more welcome now than last year
52561	Yes, definitely	Just as welcome now as I felt last year
...
88829	Yes, definitely	Somewhat more welcome now than last year
88843	Yes, definitely	Somewhat more welcome now than last year

88856	No, not really	Somewhat less welcome now than last year
88869	Neutral	A lot more welcome now than last year
88872	Yes, definitely	Somewhat more welcome now than last year

		SONewContent	Age	Gender	\
Respondent					
22013	Tech articles written by other developers;Indu...	NaN		Man	
28243	Tech meetups or events in your area	NaN		NaN	
72732	Tech articles written by other developers;Tech...	NaN		Man	
16793	Tech articles written by other developers;Indu...	27.0		Man	
52561	Tech articles written by other developers;Indu...	31.0		Man	
...			
88829	Tech articles written by other developers;Indu...	21.0		Man	
88843	Industry news about technologies you're intere...	22.0		Man	
88856	Tech articles written by other developers;Indu...	NaN		NaN	
88869	Tech articles written by other developers	30.0		Man	
88872	Tech articles written by other developers;Cour...	NaN		Man	

	Trans	Sexuality	Ethnicity	Dependents	\
Respondent					
22013	No	Straight / Heterosexual	NaN	Yes	
28243	NaN	Straight / Heterosexual	NaN	Yes	
72732	No	NaN	NaN	Yes	
16793	No	Straight / Heterosexual	South Asian	Yes	
52561	No	Straight / Heterosexual	South Asian	Yes	
...	
88829	No	Straight / Heterosexual	South Asian	No	
88843	No	Straight / Heterosexual	South Asian	Yes	
88856	NaN	NaN	NaN	NaN	
88869	No	NaN	South Asian	No	
88872	No	NaN	NaN	Yes	

	SurveyLength	SurveyEase
Respondent		
22013	Too long	Easy
28243	Too short	Easy
72732	Too long	Easy
16793	Appropriate in length	Neither easy nor difficult
52561	Too long	Easy
...
88829	Appropriate in length	Easy
88843	Appropriate in length	Easy
88856	NaN	NaN
88869	Too long	Neither easy nor difficult
88872	NaN	Neither easy nor difficult

[9061 rows x 84 columns]


```
[230]: filt = df['Country']=='India'
df.loc[filt]['SocialMedia'].value_counts()
```

```
[230]: WhatsApp                2990
YouTube                1820
LinkedIn               955
Facebook              841
Instagram             822
Twitter              542
Reddit               473
I don't use social media 250
Snapchat              23
Hello                 5
WeChat               5
VK                   4
Youku Tudou           2
Weibo                1
Name: SocialMedia, dtype: int64
```

```
[231]: Country_grp['SocialMedia'].value_counts()
```

```
[231]: Country    SocialMedia
Afghanistan    Facebook          15
               YouTube           9
               I don't use social media 6
               WhatsApp           4
               Instagram          1
               ..
Zimbabwe       Facebook           3
               YouTube           3
               Instagram          2
               LinkedIn           2
               Reddit             1
Name: SocialMedia, Length: 1220, dtype: int64
```

```
[232]: Country_grp['SocialMedia'].value_counts().loc['China']
```

```
[232]: SocialMedia
WeChat                403
YouTube              53
Weibo                42
I don't use social media 27
Twitter              27
Reddit              12
LinkedIn            11
Facebook            8
Instagram           7
```

```

Youku Tudou          7
WhatsApp             3
VK                   1
Name: SocialMedia, dtype: int64

```

```
[233]: Country_grp['SalaryUSD'].value_counts()
```

```

[233]: Country      SalaryUSD
Afghanistan  0.0          2
          1116.0         1
          1596.0         1
          3996.0         1
          4464.0         1
          ..
Zimbabwe    30000.0        1
          42000.0         1
          45000.0         1
          70000.0         1
          180000.0         1
Name: SalaryUSD, Length: 15016, dtype: int64

```

```
[234]: Country_grp['SalaryUSD'].value_counts().loc['Germany']
```

```

[234]: SalaryUSD
68745.0      184
57287.0      131
54996.0      127
74474.0       100
63016.0        94
...
952668.0        1
962450.0         1
976176.0         1
998172.0         1
2000000.0         1
Name: SalaryUSD, Length: 693, dtype: int64

```

```
[235]: Country_grp['SalaryUSD'].median().loc['Germany']
```

```
[235]: 63016.0
```

```
[236]: Country_grp['SalaryUSD'].agg(['median', 'mean']).loc['Canada']
```

```

[236]: median      68705.000000
      mean      134018.564909
      Name: Canada, dtype: float64

```

```
[237]: filt =df['Country']=='India'
df.loc[filt]['LanguageWorkedWith']
```

```
[237]: Respondent
22013    Assembly;Bash/Shell/PowerShell;C;C++;Java;Java...
28243          C++;C#;Java;JavaScript;Objective-C;Python
72732          Java;Python;SQL
16793    Assembly;Bash/Shell/PowerShell;C;C++;C#;Dart;G...
52561          C#;JavaScript
...
88829    Bash/Shell/PowerShell;C;C++;HTML/CSS;JavaScrip...
88843    Bash/Shell/PowerShell;C;C++;HTML/CSS;Java;Java...
88856          HTML/CSS;JavaScript;PHP;TypeScript
88869          HTML/CSS;JavaScript;PHP;SQL
88872          Java;Ruby;SQL
Name: LanguageWorkedWith, Length: 9061, dtype: object
```

```
[238]: df.loc[filt]['LanguageWorkedWith'].str.contains('Python',na=False).sum()
```

```
[238]: 3105
```

```
[239]: Country_grp('LanguageWorkedWith').str.contains('Python').sum()
```

```

      □
↳ -----

      TypeError                                Traceback (most recent call↳
↳last)

      <ipython-input-239-a7f3fbaf5cf8> in <module>
      ----> 1 Country_grp('LanguageWorkedWith').str.contains('Python').sum()

      TypeError: 'DataFrameGroupBy' object is not callable

```

```
[240]: Country_grp["LanguageWorkedWith"].apply(lambda x : x.str.contains('Python').
↳sum())
```

```
[240]: Country
Afghanistan          8
Albania              23
Algeria             40
Andorra              0
Angola               2
..
Venezuela, Bolivarian Republic of... 28
```

```

Viet Nam          78
Yemen             3
Zambia            4
Zimbabwe          14
Name: LanguageWorkedWith, Length: 179, dtype: int64

```

```

[255]: country_uses_python= Country_grp["LanguageWorkedWith"].apply(lambda x : x.str.
      ↪contains('Python').sum())
country_uses_python

```

```

[255]: Country
Afghanistan          8
Albania              23
Algeria              40
Andorra              0
Angola               2
..
Venezuela, Bolivarian Republic of... 28
Viet Nam            78
Yemen               3
Zambia              4
Zimbabwe            14
Name: LanguageWorkedWith, Length: 179, dtype: int64

```

```

[257]: country_respondents= df['Country'].value_counts()
country_respondents

```

```

[257]: United States      20949
India                    9061
Germany                  5866
United Kingdom           5737
Canada                   3395
...
Saint Kitts and Nevis    1
Chad                     1
Timor-Leste              1
Dominica                 1
Tonga                    1
Name: Country, Length: 179, dtype: int64

```

```

[259]: python_df = pd.
      ↪concat(['country_respondents', 'country_uses_python'],axis='columns',sort=False)
python_df

```

```

      ↪-----

```

```

TypeError                                Traceback (most recent call
↳last)

<ipython-input-259-96dc50b8a8e3> in <module>
----> 1 python_df = pd.
↳concat(['country_respondents', 'country_uses_python'], axis='columns', sort=False)
      2 python_df

~\anaconda3\lib\site-packages\pandas\core\reshape\concat.py in
↳concat(objs, axis, join, ignore_index, keys, levels, names, verify_integrity,
↳sort, copy)
      279         verify_integrity=verify_integrity,
      280         copy=copy,
--> 281         sort=sort,
      282     )
      283

~\anaconda3\lib\site-packages\pandas\core\reshape\concat.py in
↳__init__(self, objs, axis, join, keys, levels, names, ignore_index,
↳verify_integrity, copy, sort)
      355         "only Series and DataFrame objs are valid".
↳format(typ=type(obj))
      356     )
--> 357         raise TypeError(msg)
      358
      359     # consolidate

TypeError: cannot concatenate object of type '<class 'str'>'; only
↳Series and DataFrame objs are valid

```

```

[260]: python_df = pd.concat([country_respondents, country_uses_python],
↳axis='columns', sort=False)
python_df

```

```

[260]:

```

	Country	LanguageWorkedWith
United States	20949	10083
India	9061	3105
Germany	5866	2451
United Kingdom	5737	2384
Canada	3395	1558
...
Saint Kitts and Nevis	1	0
Chad	1	0

Timor-Leste	1	1
Dominica	1	1
Tonga	1	0

[179 rows x 2 columns]

```
[263]: python_df.rename(columns={'Country': 'NumRespondents', 'LanguageWorkedWith':  
    ↪ 'NumKnowsPython'}, inplace=True)
```

```
[264]: python_df
```

```
[264]:
```

	NumRespondents	NumKnowsPython
United States	20949	10083
India	9061	3105
Germany	5866	2451
United Kingdom	5737	2384
Canada	3395	1558
...
Saint Kitts and Nevis	1	0
Chad	1	0
Timor-Leste	1	1
Dominica	1	1
Tonga	1	0

[179 rows x 2 columns]

```
[265]: python_df['PctKnowsPython'] = (python_df['NumKnowsPython']/  
    ↪ python_df['NumRespondents']) * 100  
python_df
```

```
[265]:
```

	NumRespondents	NumKnowsPython	PctKnowsPython
United States	20949	10083	48.131176
India	9061	3105	34.267741
Germany	5866	2451	41.783157
United Kingdom	5737	2384	41.554820
Canada	3395	1558	45.891016
...
Saint Kitts and Nevis	1	0	0.000000
Chad	1	0	0.000000
Timor-Leste	1	1	100.000000
Dominica	1	1	100.000000
Tonga	1	0	0.000000

[179 rows x 3 columns]

```
[266]: python_df.sort_values(by='PctKnowsPython', ascending=False, inplace=True)
```

```
[267]: python_df.head(20)
```

```
[267]:
```

	NumRespondents	NumKnowsPython	PctKnowsPython
Dominica	1	1	100.000000
Timor-Leste	1	1	100.000000
Niger	1	1	100.000000
Sao Tome and Principe	1	1	100.000000
Turkmenistan	7	6	85.714286
Mauritania	7	5	71.428571
Guinea	3	2	66.666667
Bahamas	3	2	66.666667
Guyana	3	2	66.666667
Uganda	72	47	65.277778
Iceland	49	30	61.224490
Namibia	5	3	60.000000
Haiti	5	3	60.000000
Benin	5	3	60.000000
Congo, Republic of the...	7	4	57.142857
Oman	11	6	54.545455
Cuba	30	16	53.333333
Republic of Korea	39	20	51.282051
Monaco	4	2	50.000000
South Korea	160	80	50.000000

```
[268]: python_df.loc['Japan']
```

```
[268]: NumRespondents    391.000000  
NumKnowsPython        182.000000  
PctKnowsPython         46.547315  
Name: Japan, dtype: float64
```

```
[ ]:
```