

Pandas - Unique nunique groupby lambda pivot

```
In [2]: import pandas as pd
```

```
In [3]: schema_df = pd.read_csv("survey_results_schema.csv",index_col="qname")  
schema_df
```

Out[3]:

	qid	question	force_resp	type	selector
qname					
S0	QID16	<div>Hel...	False	DB	TB
MetalInfo	QID12	Browser Meta Info	False	Meta	Browser
S1	QID1		False	DB	TB
MainBranch	QID2	Which of the following options best describes ...	True	MC	SAVR
Employment	QID24	Which of the following best describes your cur...	False	MC	MAVR
Country	QID6	Where do you live? <span style="font-weight: b...	True	MC	DL
US_State	QID7	<p>In which state or territory of the USA do y...	False	MC	DL
UK_Country	QID9	In which part of the United Kingdom do you liv...	False	MC	DL
S2	QID190		False	DB	TB
EdLevel	QID25	Which of the following best describes the high...	False	MC	SAVR
Age1stCode	QID149	At what age did you write your first line of c...	False	MC	MAVR
LearnCode	QID276	How did you learn to code? Select all that apply.	False	MC	MAVR
YearsCode	QID32	Including any education, how many years have y...	False	MC	DL
YearsCodePro	QID34	NOT including education, how many years have y...	False	MC	DL
DevType	QID31	Which of the following describes your current ...	False	MC	MAVR
OrgSize	QID29	Approximately how many people are employed by ...	False	MC	MAVR
Currency	QID50	Which currency do you use day-to-day? If your ...	True	MC	SB
CompTotal	QID51	What is your current total compensation (salar...	False	TE	SL
CompFreq	QID52	Is that compensation weekly, monthly, or yearly?	False	MC	MAVR
S3	QID61		False	DB	TB
Language	QID233	Which programming, scripting, and markup la...	False	Matrix	Likert
Database	QID262	Which database environments have you do...	False	Matrix	Likert
Platform	QID263	Which cloud platforms have you done ext...	False	Matrix	Likert

	qid	question	force_resp	type	selector
	qname				
	Webframe	QID264 Which web frameworks other frameworks and libraries	False	Matrix	Likert
	MiscTech	QID265 Which other frameworks and libraries have you done ext...	False	Matrix	Likert
	ToolsTech	QID275 Which tools have you done ext...	False	Matrix	Likert
	NEWCollabTools	QID274 Which development environments do you use ext...	False	Matrix	Likert
	OpSys	QID71 What is the primary operating system in which you run your dev envs?	False	MC	SAVR
	NEWStuck	QID243 What do you do when you get stuck on a problem...	False	MC	MAVR
	S4	QID91 What is the primary operating system in which you run your dev envs?	False	DB	TB
	NEWSOSites	QID266 Which of the following Stack Overflow sites have you visited in the last month?	False	MC	MAVR
	SOVisitFreq	QID100 How frequently would you say you visit Stack Overflow?	False	MC	MAVR
	SOAccount	QID101 Do you have a Stack Overflow account?	False	MC	MAVR
	SOPartFreq	QID102 How frequently would you say you participate in Stack Overflow?	False	MC	MAVR
	SOComm	QID106 Do you consider yourself a member of the Stack Overflow community?	False	MC	MAVR
	NEWOtherComms	QID267 Are you a member of any other online developer communities?	False	MC	MAVR
	NEWOtherCommsNames	QID268 Please name up to 5 other online developer communities.	False	Matrix	Likert
	S5	QID121 What is your age?	False	DB	TB
	Age	QID127 What is your age?	False	MC	MAVR
	Gender	QID122 Which of the following describe you, if any? Please check all that apply.	False	MC	MAVR
	Trans	QID153 Do you identify as transgender?	False	MC	MAVR
	Sexuality	QID136 Which of the following describe you, if any? Please check all that apply.	False	MC	MAVR
	Ethnicity	QID126 Which of the following describe you, if any? Please check all that apply.	False	MC	MAVR
	Accessibility	QID124 Which of the following describe you, if any? Please check all that apply.	False	MC	MAVR
	MentalHealth	QID125 Which of the following describe you, if any? Please check all that apply.	False	MC	MAVR
	S6	QID131 Final Question	False	DB	TB

qid	question	force_resp	type	selector
qname				
SurveyLength	QID132 How do you feel about the length of the survey...	False	MC	MAVR
SurveyEase	QID133 How easy or difficult was this survey to compl...	False	MC	MAVR

In [4]: #Displaying unique values from a column
 schema_df.qid.unique()

Out[4]: array(['QID16', 'QID12', 'QID1', 'QID2', 'QID24', 'QID6', 'QID7', 'QID9',
 'QID190', 'QID25', 'QID149', 'QID276', 'QID32', 'QID34', 'QID31',
 'QID29', 'QID50', 'QID51', 'QID52', 'QID61', 'QID233', 'QID262',
 'QID263', 'QID264', 'QID265', 'QID275', 'QID274', 'QID71',
 'QID243', 'QID91', 'QID266', 'QID100', 'QID101', 'QID102',
 'QID106', 'QID267', 'QID268', 'QID121', 'QID127', 'QID122',
 'QID153', 'QID136', 'QID126', 'QID124', 'QID125', 'QID131',
 'QID132', 'QID133'], dtype=object)

```
In [5]: #creating list of unique values
schema_df.qid.unique().tolist()
```

```
Out[5]: ['QID16',
 'QID12',
 'QID1',
 'QID2',
 'QID24',
 'QID6',
 'QID7',
 'QID9',
 'QID190',
 'QID25',
 'QID149',
 'QID276',
 'QID32',
 'QID34',
 'QID31',
 'QID29',
 'QID50',
 'QID51',
 'QID52',
 'QID61',
 'QID233',
 'QID262',
 'QID263',
 'QID264',
 'QID265',
 'QID275',
 'QID274',
 'QID71',
 'QID243',
 'QID91',
 'QID266',
 'QID100',
 'QID101',
 'QID102',
 'QID106',
 'QID267',
 'QID268',
 'QID121',
 'QID127',
 'QID122',
 'QID153',
 'QID136',
 'QID126',
 'QID124',
 'QID125',
 'QID131',
 'QID132',
 'QID133']
```

```
In [6]: #Unique values across multiple columns  
schema_df[["qid","force_resp"]].drop_duplicates()
```

Out[6]:

	qid	force_resp
qname		
S0	QID16	False
MetalInfo	QID12	False
S1	QID1	False
MainBranch	QID2	True
Employment	QID24	False
Country	QID6	True
US_State	QID7	False
UK_Country	QID9	False
S2	QID190	False
EdLevel	QID25	False
Age1stCode	QID149	False
LearnCode	QID276	False
YearsCode	QID32	False
YearsCodePro	QID34	False
DevType	QID31	False
OrgSize	QID29	False
Currency	QID50	True
CompTotal	QID51	False
CompFreq	QID52	False
S3	QID61	False
Language	QID233	False
Database	QID262	False
Platform	QID263	False
Webframe	QID264	False
MiscTech	QID265	False
ToolsTech	QID275	False
NEWCollabTools	QID274	False
OpSys	QID71	False
NEWStuck	QID243	False
S4	QID91	False
NEWSOSites	QID266	False
SOVisitFreq	QID100	False
SOAccount	QID101	False
SOPartFreq	QID102	False

	qid	force_resp
qname		
SOComm	QID106	False
NEWOtherComms	QID267	False
NEWOtherCommsNames	QID268	False
S5	QID121	False
Age	QID127	False
Gender	QID122	False
Trans	QID153	False
Sexuality	QID136	False
Ethnicity	QID126	False
Accessibility	QID124	False
MentalHealth	QID125	False
S6	QID131	False
SurveyLength	QID132	False
SurveyEase	QID133	False

In [7]: #Number of unique values in a column per row
schema_df["qid"].value_counts()

Out[7]:

QID149	1
QID265	1
QID122	1
QID1	1
QID276	1
QID125	1
QID124	1
QID268	1
QID275	1
QID131	1
QID71	1
QID153	1
QID106	1
QID263	1
QID2	1
QID25	1
QID262	1
QID136	1
QID243	1
QID132	1
QID29	1
QID34	1
QID24	1
QID133	1
QID12	1
QID31	1
QID7	1
QID190	1
QID264	1
QID61	1
QID16	1
QID50	1
QID101	1
QID51	1
QID9	1
QID91	1
QID233	1
QID121	1
QID274	1
QID102	1
QID52	1
QID127	1
QID126	1
QID100	1
QID267	1
QID32	1
QID266	1
QID6	1

Name: qid, dtype: int64

In [8]: *#Nunique returns per column how many unique values are available*
schema_df.nunique()

Out[8]:

qid	48
question	45
force_resp	2
type	5
selector	8
dtype:	int64

```
In [9]: #Group by - Loading dataset for df
df = pd.read_csv("survey_results_public.csv", index_col="ResponseId")
df
```

Out[9]:

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
1	I am a developer by profession	Independent contractor, freelancer, or self-em...	Slovakia	NaN	NaN	Secondary school (e.g. American high school, G...
2	I am a student who is learning to code	Student, full-time	Netherlands	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
3	I am not primarily a developer, but I write co...	Student, full-time	Russian Federation	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
4	I am a developer by profession	Employed full-time	Austria	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
5	I am a developer by profession	Independent contractor, freelancer, or self-em...	United Kingdom of Great Britain and Northern I...	NaN	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
6	I am a student who is learning to code	Student, part-time	United States of America	Georgia	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
7	I code primarily as a hobby	I prefer not to say	United States of America	New Hampshire	NaN	Secondary school (e.g. American high school, G...
8	I am a student who is learning to code	Student, full-time	Malaysia	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
9	I am a developer by profession	Employed part-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
10	I am a developer by profession	Employed full-time	Sweden	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
11	I am a developer by profession	Employed full-time	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
12	I am a developer by profession	Employed full-time	Spain	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
13	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
14	I am a student who is learning to code	Employed full-time	Peru	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
15	I used to be a developer by profession, but no...	Not employed, but looking for work	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
16	I am a student who is learning to code	Student, full-time	United States of America	Missouri	NaN	Secondary school (e.g. American high school, G...
17	I am a developer by profession	Employed full-time	Turkey	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
18	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
19	I am not primarily a developer, but I write co...	I prefer not to say	Singapore	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
20	I used to be a developer by profession, but no...	Employed full-time	Brazil	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
21	I am a developer by profession	Student, full-time	Germany	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
22	I am a student who is learning to code	Student, full-time	Sweden	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
23	I am a student who is learning to code	Student, full-time	India	NaN	NaN	Some college/university study without earning ...
24	I am a developer by profession	Employed full-time	France	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
25	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
26	I am not primarily a developer, but I write code...	Employed full-time	Germany	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
27	I am not primarily a developer, but I write code...	Employed full-time	Switzerland	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
28	I am a developer by profession	Employed full-time	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
29	I am a developer by profession	Independent contractor, freelancer, or self-em...	United Kingdom of Great Britain and Northern I...	NaN	England	Secondary school (e.g. American high school, G...
30	I am a developer by profession	Employed full-time	Russian Federation	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
...
83410	I am a developer by profession	Employed full-time	Netherlands	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
83411	I am a student who is learning to code	Student, part-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83412	I am a developer by profession	Employed full-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83413	I am a developer by profession	Independent contractor, freelancer, or self-em...	United States of America	Oregon	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83414	I used to be a developer by profession, but no...	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83415	I code primarily as a hobby	Student, full-time	United States of America	Maryland	NaN	Secondary school (e.g. American high school, G...
83416	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
83417	I am a developer by profession	Employed full-time	United States of America	New Mexico	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83418	I am a developer by profession	Student, full-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83419	I am a student who is learning to code	Student, full-time	Israel	NaN	NaN	Primary/elementary school
83420	I am a developer by profession	Employed full-time	Austria	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83421	I am a developer by profession	Employed full-time	France	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83422	I am a developer by profession	Independent contractor, freelancer, or self-em...	Norway	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83423	I am not primarily a developer, but I write co...	Independent contractor, freelancer, or self-em...	Viet Nam	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83424	I am a developer by profession	Employed part-time	Cameroon	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83425	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83426	I am a developer by profession	Employed full-time	Finland	NaN	NaN	Secondary school (e.g. American high school, G...
83427	I am a developer by profession	Employed full-time	United States of America	Nebraska	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83428	I am a developer by profession	Employed full-time	United States of America	Pennsylvania	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83429	I am a developer by profession	Employed full-time	Brazil	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
83430	I code primarily as a hobby	Not employed, but looking for work	United States of America	Washington	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83431	I am a developer by profession	Employed full-time	United States of America	Illinois	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83432	I am a developer by profession	Independent contractor, freelancer, or self-em...	Pakistan	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83433	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83434	I am a developer by profession	Independent contractor, freelancer, or self-em...	Brazil	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83435	I am a developer by profession	Employed full-time	United States of America	Texas	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83436	I am a developer by profession	Independent contractor, freelancer, or self-em...	Benin	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83437	I am a developer by profession	Employed full-time	United States of America	New Jersey	NaN	Secondary school (e.g. American high school, G...
83438	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83439	I am a developer by profession	Employed full-time	Brazil	NaN	NaN	Professional degree (JD, MD, etc.)

83439 rows × 47 columns



```
In [10]: #Groupby - Single Group, Single column  
df.groupby(["Country"])["ConvertedCompYearly"].sum()
```

Out[10]: Country

Afghanistan	3.074223e+07
Albania	1.574935e+06
Algeria	2.024560e+05
Andorra	3.571280e+05
Angola	2.155680e+05
Argentina	1.885638e+07
Armenia	1.406032e+06
Australia	1.524455e+08
Austria	2.979818e+07
Azerbaijan	6.016200e+05
Bahamas	0.000000e+00
Bahrain	9.691200e+05
Bangladesh	3.711620e+06
Barbados	1.108420e+05
Belarus	3.778881e+06
Belgium	7.737338e+07
Belize	8.649300e+04
Benin	6.775200e+04
Bhutan	2.943600e+04
Bolivia	7.750920e+05
Bosnia and Herzegovina	3.203057e+06
Botswana	1.615200e+04
Brazil	6.682480e+07
Brunei Darussalam	0.000000e+00
Bulgaria	1.090920e+07
Burkina Faso	2.373600e+04
Burundi	1.584000e+03
Cambodia	2.002134e+06
Cameroon	1.051530e+05
Canada	2.348173e+08
...	
Sri Lanka	2.199361e+06
Sudan	1.124160e+05
Suriname	1.681200e+04
Swaziland	1.268410e+05
Sweden	6.297064e+07
Switzerland	8.928460e+07
Syrian Arab Republic	4.464200e+05
Taiwan	7.483325e+06
Tajikistan	2.970000e+04
Thailand	5.559298e+06
The former Yugoslav Republic of Macedonia	9.266580e+05
Togo	1.696800e+04
Trinidad and Tobago	4.185600e+05
Tunisia	8.590300e+05
Turkey	2.029807e+07
Turkmenistan	5.401200e+04
Tuvalu	0.000000e+00
Uganda	8.468520e+05
Ukraine	2.066502e+07
United Arab Emirates	4.462467e+06
United Kingdom of Great Britain and Northern Ireland	4.151475e+08
United Republic of Tanzania	5.006060e+05
United States of America	2.595750e+09
Uruguay	5.746919e+06
Uzbekistan	6.660440e+05

```
Venezuela, Bolivarian Republic of...      1.392833e+06
Viet Nam                                2.953027e+06
Yemen                                    3.377200e+04
Zambia                                  2.190640e+05
Zimbabwe                               1.483920e+05
Name: ConvertedCompYearly, Length: 181, dtype: float64
```

```
In [11]: #Groupby - Multiple columns
df.groupby(["Country","SurveyLength"], as_index=False) ["ConvertedCompYearly"]
.sum()
```

Out[11]:

	Country	SurveyLength	ConvertedCompYearly
0	Afghanistan	Appropriate in length	1.749360e+05
1	Afghanistan	Too long	9.400800e+04
2	Afghanistan	Too short	3.047318e+07
3	Albania	Appropriate in length	4.928790e+05
4	Albania	Too long	7.662140e+05
5	Albania	Too short	2.893460e+05
6	Algeria	Appropriate in length	1.888040e+05
7	Algeria	Too long	1.365200e+04
8	Algeria	Too short	0.000000e+00
9	Andorra	Appropriate in length	2.101470e+05
10	Andorra	Too long	0.000000e+00
11	Andorra	Too short	0.000000e+00
12	Angola	Appropriate in length	1.030560e+05
13	Angola	Too long	9.600000e+04
14	Angola	Too short	1.651200e+04
15	Argentina	Appropriate in length	1.590045e+07
16	Argentina	Too long	2.209520e+06
17	Argentina	Too short	5.358800e+05
18	Armenia	Appropriate in length	1.186614e+06
19	Armenia	Too long	1.798800e+05
20	Armenia	Too short	2.508000e+04
21	Australia	Appropriate in length	1.327631e+08
22	Australia	Too long	9.088757e+06
23	Australia	Too short	1.053343e+07
24	Austria	Appropriate in length	2.509459e+07
25	Austria	Too long	3.040118e+06
26	Austria	Too short	1.568355e+06
27	Azerbaijan	Appropriate in length	4.957320e+05
28	Azerbaijan	Too long	8.188800e+04
29	Azerbaijan	Too short	2.400000e+04
...
445	United Arab Emirates	Too long	1.474549e+06
446	United Arab Emirates	Too short	7.023600e+04
447	United Kingdom of Great Britain and Northern I...	Appropriate in length	3.666192e+08
448	United Kingdom of Great Britain and Northern I...	Too long	2.362917e+07

	Country	SurveyLength	ConvertedCompYearly
449	United Kingdom of Great Britain and Northern I...	Too short	1.845398e+07
450	United Republic of Tanzania	Appropriate in length	3.936510e+05
451	United Republic of Tanzania	Too long	1.069550e+05
452	United Republic of Tanzania	Too short	0.000000e+00
453	United States of America	Appropriate in length	2.218568e+09
454	United States of America	Too long	1.817453e+08
455	United States of America	Too short	1.664650e+08
456	Uruguay	Appropriate in length	5.242859e+06
457	Uruguay	Too long	3.467400e+05
458	Uruguay	Too short	1.573200e+05
459	Uzbekistan	Appropriate in length	4.695880e+05
460	Uzbekistan	Too long	1.664560e+05
461	Uzbekistan	Too short	1.200000e+04
462	Venezuela, Bolivarian Republic of...	Appropriate in length	1.230240e+06
463	Venezuela, Bolivarian Republic of...	Too long	1.562400e+05
464	Venezuela, Bolivarian Republic of...	Too short	6.353000e+03
465	Viet Nam	Appropriate in length	1.897101e+06
466	Viet Nam	Too long	9.606700e+05
467	Viet Nam	Too short	6.990000e+04
468	Yemen	Appropriate in length	3.377200e+04
469	Yemen	Too long	0.000000e+00
470	Zambia	Appropriate in length	2.092480e+05
471	Zambia	Too long	9.816000e+03
472	Zimbabwe	Appropriate in length	1.311920e+05
473	Zimbabwe	Too long	1.720000e+04
474	Zimbabwe	Too short	0.000000e+00

475 rows × 3 columns

```
In [12]: #Groupby - Multiple columns and Functions Like sum and mean  
df.groupby(["Country","SurveyLength"])["ConvertedCompYearly"].agg(["mean","su  
m"])
```

Out[12]:

Country	SurveyLength	mean	sum
Afghanistan	Appropriate in length	4.373400e+04	1.749360e+05
	Too long	2.350200e+04	9.400800e+04
	Too short	1.523659e+07	3.047318e+07
Albania	Appropriate in length	1.971516e+04	4.928790e+05
	Too long	1.915535e+05	7.662140e+05
	Too short	5.786920e+04	2.893460e+05
Algeria	Appropriate in length	1.452338e+04	1.888040e+05
	Too long	1.365200e+04	1.365200e+04
	Too short	NaN	0.000000e+00
Andorra	Appropriate in length	7.004900e+04	2.101470e+05
	Too long	NaN	0.000000e+00
	Too short	NaN	0.000000e+00
Angola	Appropriate in length	1.717600e+04	1.030560e+05
	Too long	9.600000e+04	9.600000e+04
	Too short	5.504000e+03	1.651200e+04
Argentina	Appropriate in length	4.608826e+04	1.590045e+07
	Too long	4.509224e+04	2.209520e+06
	Too short	4.465667e+04	5.358800e+05
Armenia	Appropriate in length	3.955380e+04	1.186614e+06
	Too long	1.798800e+04	1.798800e+05
	Too short	2.508000e+04	2.508000e+04
Australia	Appropriate in length	1.605358e+05	1.327631e+08
	Too long	1.594519e+05	9.088757e+06
	Too short	1.620528e+05	1.053343e+07
Austria	Appropriate in length	6.401680e+04	2.509459e+07
	Too long	7.414922e+04	3.040118e+06
	Too short	8.254500e+04	1.568355e+06
Azerbaijan	Appropriate in length	1.982928e+04	4.957320e+05
	Too long	2.047200e+04	8.188800e+04

Country	SurveyLength	mean	sum
	Too short	2.400000e+04	2.400000e+04

United Arab Emirates	Too long	5.084652e+04	1.474549e+06
	Too short	7.023600e+04	7.023600e+04
United Kingdom of Great Britain and Northern Ireland	Appropriate in length	1.428201e+05	3.666192e+08
	Too long	1.342567e+05	2.362917e+07
	Too short	1.153374e+05	1.845398e+07
United Republic of Tanzania	Appropriate in length	1.711526e+04	3.936510e+05
	Too long	3.565167e+04	1.069550e+05
	Too short	NaN	0.000000e+00
United States of America	Appropriate in length	2.619634e+05	2.218568e+09
	Too long	2.757895e+05	1.817453e+08
	Too short	2.756044e+05	1.664650e+08
Uruguay	Appropriate in length	5.242859e+04	5.242859e+06
	Too long	4.334250e+04	3.467400e+05
	Too short	3.146400e+04	1.573200e+05
Uzbekistan	Appropriate in length	1.806108e+04	4.695880e+05
	Too long	2.377943e+04	1.664560e+05
	Too short	1.200000e+04	1.200000e+04
Venezuela, Bolivarian Republic of...	Appropriate in length	2.278222e+04	1.230240e+06
	Too long	2.604000e+04	1.562400e+05
	Too short	3.176500e+03	6.353000e+03
Viet Nam	Appropriate in length	1.841846e+04	1.897101e+06
	Too long	2.528079e+04	9.606700e+05
	Too short	1.747500e+04	6.990000e+04
Yemen	Appropriate in length	5.628667e+03	3.377200e+04
	Too long	NaN	0.000000e+00
Zambia	Appropriate in length	2.092480e+04	2.092480e+05
	Too long	9.816000e+03	9.816000e+03
Zimbabwe	Appropriate in length	1.192655e+04	1.311920e+05

	mean	sum
Country	SurveyLength	
Too long	8.600000e+03	1.720000e+04
Too short	NaN	0.000000e+00

475 rows × 2 columns

In [13]: df.columns

Out[13]: Index(['MainBranch', 'Employment', 'Country', 'US_State', 'UK_Country', 'EdLevel', 'Age1stCode', 'LearnCode', 'YearsCode', 'YearsCodePro', 'DevType', 'OrgSize', 'Currency', 'CompTotal', 'CompFreq', 'LanguageHaveWorkedWith', 'LanguageWantToWorkWith', 'DatabaseHaveWorkedWith', 'DatabaseWantToWorkWith', 'PlatformHaveWorkedWith', 'PlatformWantToWorkWith', 'WebframeHaveWorkedWith', 'WebframeWantToWorkWith', 'MiscTechHaveWorkedWith', 'MiscTechWantToWorkWith', 'ToolsTechHaveWorkedWith', 'ToolsTechWantToWorkWith', 'NEWCollabToolsHaveWorkedWith', 'NEWCollabToolsWantToWorkWith', 'OpSys', 'NEWStuck', 'NEWSOSites', 'SOVisitFreq', 'SOAccount', 'SOPartFreq', 'SOComm', 'NEWOtherComms', 'Age', 'Gender', 'Trans', 'Sexuality', 'Ethnicity', 'Accessibility', 'MentalHealth', 'SurveyLength', 'SurveyEase', 'ConvertedCompYearly'], dtype='object')

```
In [14]: #Creating a new column age_bins to distribute data into different category of  
one column (bucketing)  
df["comp_bins"] = pd.cut(df["ConvertedCompYearly"], bins=3, labels=("high", "m  
edium", "low"))  
df
```

Out[14]:

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
1	I am a developer by profession	Independent contractor, freelancer, or self-em...	Slovakia	NaN	NaN	Secondary school (e.g. American high school, G...
2	I am a student who is learning to code	Student, full-time	Netherlands	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
3	I am not primarily a developer, but I write co...	Student, full-time	Russian Federation	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
4	I am a developer by profession	Employed full-time	Austria	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
5	I am a developer by profession	Independent contractor, freelancer, or self-em...	United Kingdom of Great Britain and Northern I...	NaN	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
6	I am a student who is learning to code	Student, part-time	United States of America	Georgia	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
7	I code primarily as a hobby	I prefer not to say	United States of America	New Hampshire	NaN	Secondary school (e.g. American high school, G...
8	I am a student who is learning to code	Student, full-time	Malaysia	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
9	I am a developer by profession	Employed part-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
10	I am a developer by profession	Employed full-time	Sweden	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
11	I am a developer by profession	Employed full-time	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
12	I am a developer by profession	Employed full-time	Spain	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
13	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
14	I am a student who is learning to code	Employed full-time	Peru	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
15	I used to be a developer by profession, but no...	Not employed, but looking for work	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
16	I am a student who is learning to code	Student, full-time	United States of America	Missouri	NaN	Secondary school (e.g. American high school, G...
17	I am a developer by profession	Employed full-time	Turkey	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
18	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
19	I am not primarily a developer, but I write co...	I prefer not to say	Singapore	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
20	I used to be a developer by profession, but no...	Employed full-time	Brazil	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
21	I am a developer by profession	Student, full-time	Germany	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
22	I am a student who is learning to code	Student, full-time	Sweden	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
23	I am a student who is learning to code	Student, full-time	India	NaN	NaN	Some college/university study without earning ...
24	I am a developer by profession	Employed full-time	France	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
25	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
26	I am not primarily a developer, but I write code...	Employed full-time	Germany	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
27	I am not primarily a developer, but I write code...	Employed full-time	Switzerland	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
28	I am a developer by profession	Employed full-time	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
29	I am a developer by profession	Independent contractor, freelancer, or self-em...	United Kingdom of Great Britain and Northern I...	NaN	England	Secondary school (e.g. American high school, G...
30	I am a developer by profession	Employed full-time	Russian Federation	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
...
83410	I am a developer by profession	Employed full-time	Netherlands	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
83411	I am a student who is learning to code	Student, part-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83412	I am a developer by profession	Employed full-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83413	I am a developer by profession	Independent contractor, freelancer, or self-em...	United States of America	Oregon	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83414	I used to be a developer by profession, but no...	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83415	I code primarily as a hobby	Student, full-time	United States of America	Maryland	NaN	Secondary school (e.g. American high school, G...
83416	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
83417	I am a developer by profession	Employed full-time	United States of America	New Mexico	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83418	I am a developer by profession	Student, full-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83419	I am a student who is learning to code	Student, full-time	Israel	NaN	NaN	Primary/elementary school
83420	I am a developer by profession	Employed full-time	Austria	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83421	I am a developer by profession	Employed full-time	France	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83422	I am a developer by profession	Independent contractor, freelancer, or self-em...	Norway	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83423	I am not primarily a developer, but I write co...	Independent contractor, freelancer, or self-em...	Viet Nam	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83424	I am a developer by profession	Employed part-time	Cameroon	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83425	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83426	I am a developer by profession	Employed full-time	Finland	NaN	NaN	Secondary school (e.g. American high school, G...
83427	I am a developer by profession	Employed full-time	United States of America	Nebraska	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83428	I am a developer by profession	Employed full-time	United States of America	Pennsylvania	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83429	I am a developer by profession	Employed full-time	Brazil	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
83430	I code primarily as a hobby	Not employed, but looking for work	United States of America	Washington	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83431	I am a developer by profession	Employed full-time	United States of America	Illinois	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83432	I am a developer by profession	Independent contractor, freelancer, or self-em...	Pakistan	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83433	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83434	I am a developer by profession	Independent contractor, freelancer, or self-em...	Brazil	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83435	I am a developer by profession	Employed full-time	United States of America	Texas	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83436	I am a developer by profession	Independent contractor, freelancer, or self-em...	Benin	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83437	I am a developer by profession	Employed full-time	United States of America	New Jersey	NaN	Secondary school (e.g. American high school, G...
83438	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83439	I am a developer by profession	Employed full-time	Brazil	NaN	NaN	Professional degree (JD, MD, etc.)

83439 rows × 48 columns



```
In [15]: df["comp_bins"] = pd.cut(df["ConvertedCompYearly"], bins=3, labels=("low", "medium", "high"))
df
```

Out[15]:

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
1	I am a developer by profession	Independent contractor, freelancer, or self-em...	Slovakia	NaN	NaN	Secondary school (e.g. American high school, G...
2	I am a student who is learning to code	Student, full-time	Netherlands	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
3	I am not primarily a developer, but I write co...	Student, full-time	Russian Federation	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
4	I am a developer by profession	Employed full-time	Austria	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
5	I am a developer by profession	Independent contractor, freelancer, or self-em...	United Kingdom of Great Britain and Northern I...	NaN	England	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
6	I am a student who is learning to code	Student, part-time	United States of America	Georgia	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
7	I code primarily as a hobby	I prefer not to say	United States of America	New Hampshire	NaN	Secondary school (e.g. American high school, G...
8	I am a student who is learning to code	Student, full-time	Malaysia	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
9	I am a developer by profession	Employed part-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
10	I am a developer by profession	Employed full-time	Sweden	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
11	I am a developer by profession	Employed full-time	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
12	I am a developer by profession	Employed full-time	Spain	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
13	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
14	I am a student who is learning to code	Employed full-time	Peru	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
15	I used to be a developer by profession, but no...	Not employed, but looking for work	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
16	I am a student who is learning to code	Student, full-time	United States of America	Missouri	NaN	Secondary school (e.g. American high school, G...
17	I am a developer by profession	Employed full-time	Turkey	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
18	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
19	I am not primarily a developer, but I write co...	I prefer not to say	Singapore	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
20	I used to be a developer by profession, but no...	Employed full-time	Brazil	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
21	I am a developer by profession	Student, full-time	Germany	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
22	I am a student who is learning to code	Student, full-time	Sweden	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
23	I am a student who is learning to code	Student, full-time	India	NaN	NaN	Some college/university study without earning ...
24	I am a developer by profession	Employed full-time	France	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
25	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
26	I am not primarily a developer, but I write code...	Employed full-time	Germany	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
27	I am not primarily a developer, but I write code...	Employed full-time	Switzerland	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
28	I am a developer by profession	Employed full-time	United Kingdom of Great Britain and Northern I...	NaN	England	Bachelor's degree (B.A., B.S., B.Eng., etc.)
29	I am a developer by profession	Independent contractor, freelancer, or self-em...	United Kingdom of Great Britain and Northern I...	NaN	England	Secondary school (e.g. American high school, G...
30	I am a developer by profession	Employed full-time	Russian Federation	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
...
83410	I am a developer by profession	Employed full-time	Netherlands	NaN	NaN	Other doctoral degree (Ph.D., Ed.D., etc.)
83411	I am a student who is learning to code	Student, part-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83412	I am a developer by profession	Employed full-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83413	I am a developer by profession	Independent contractor, freelancer, or self-em...	United States of America	Oregon	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83414	I used to be a developer by profession, but no...	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83415	I code primarily as a hobby	Student, full-time	United States of America	Maryland	NaN	Secondary school (e.g. American high school, G...
83416	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
83417	I am a developer by profession	Employed full-time	United States of America	New Mexico	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83418	I am a developer by profession	Student, full-time	India	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83419	I am a student who is learning to code	Student, full-time	Israel	NaN	NaN	Primary/elementary school
83420	I am a developer by profession	Employed full-time	Austria	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83421	I am a developer by profession	Employed full-time	France	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83422	I am a developer by profession	Independent contractor, freelancer, or self-em...	Norway	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83423	I am not primarily a developer, but I write co...	Independent contractor, freelancer, or self-em...	Viet Nam	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83424	I am a developer by profession	Employed part-time	Cameroon	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83425	I am a developer by profession	Employed full-time	Germany	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83426	I am a developer by profession	Employed full-time	Finland	NaN	NaN	Secondary school (e.g. American high school, G...
83427	I am a developer by profession	Employed full-time	United States of America	Nebraska	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83428	I am a developer by profession	Employed full-time	United States of America	Pennsylvania	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83429	I am a developer by profession	Employed full-time	Brazil	NaN	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)

	MainBranch	Employment	Country	US_State	UK_Country	EdLevel
RespondId						
83430	I code primarily as a hobby	Not employed, but looking for work	United States of America	Washington	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83431	I am a developer by profession	Employed full-time	United States of America	Illinois	NaN	Master's degree (M.A., M.S., M.Eng., MBA, etc.)
83432	I am a developer by profession	Independent contractor, freelancer, or self-em...	Pakistan	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83433	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83434	I am a developer by profession	Independent contractor, freelancer, or self-em...	Brazil	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83435	I am a developer by profession	Employed full-time	United States of America	Texas	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83436	I am a developer by profession	Independent contractor, freelancer, or self-em...	Benin	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83437	I am a developer by profession	Employed full-time	United States of America	New Jersey	NaN	Secondary school (e.g. American high school, G...
83438	I am a developer by profession	Employed full-time	Canada	NaN	NaN	Bachelor's degree (B.A., B.S., B.Eng., etc.)
83439	I am a developer by profession	Employed full-time	Brazil	NaN	NaN	Professional degree (JD, MD, etc.)

83439 rows × 48 columns



In [16]: #Groupby - Multiple columns and Functions Like sum and mean for created Categorical Bin
df.groupby(["Country", "comp_bins"])["ConvertedCompYearly"].agg(["mean", "sum"])

Out[16]:

			mean	sum
Country	comp_bins			
Afghanistan	low	2.737120e+04	2.737120e+05	
	high	3.046852e+07	3.046852e+07	
Albania	low	4.499814e+04	1.574935e+06	
Algeria	low	1.446114e+04	2.024560e+05	
Andorra	low	8.928200e+04	3.571280e+05	
Angola	low	2.155680e+04	2.155680e+05	
Argentina	low	4.599118e+04	1.885638e+07	
Armenia	low	3.269842e+04	1.406032e+06	
Australia	low	1.604689e+05	1.524455e+08	
Austria	low	6.563476e+04	2.979818e+07	
Azerbaijan	low	2.005400e+04	6.016200e+05	
Bahrain	low	1.384457e+05	9.691200e+05	
Bangladesh	low	1.427546e+04	3.711620e+06	
Barbados	low	1.847367e+04	1.108420e+05	
Belarus	low	3.817052e+04	3.778881e+06	
Belgium	low	7.525073e+04	3.213206e+07	
	high	4.524131e+07	4.524131e+07	
Belize	low	2.883100e+04	8.649300e+04	
Benin	low	9.678857e+03	6.775200e+04	
Bhutan	low	1.471800e+04	2.943600e+04	
Bolivia	low	2.422162e+04	7.750920e+05	
Bosnia and Herzegovina	low	4.780682e+04	3.203057e+06	
Botswana	low	5.384000e+03	1.615200e+04	
Brazil	low	4.221402e+04	6.682480e+07	
Bulgaria	low	4.363679e+04	1.090920e+07	
Burkina Faso	low	2.373600e+04	2.373600e+04	
Burundi	low	1.584000e+03	1.584000e+03	
Cambodia	low	2.002134e+05	2.002134e+06	
Cameroon	low	6.572062e+03	1.051530e+05	
Canada	low	1.357326e+05	2.348173e+08	
...
Sri Lanka	low	1.293742e+04	2.199361e+06	
Sudan	low	1.021964e+04	1.124160e+05	
Suriname	low	8.406000e+03	1.681200e+04	

			mean	sum
	Country	comp_bins		
	Swaziland	low	2.114017e+04	1.268410e+05
	Sweden	low	7.605150e+04	6.297064e+07
	Switzerland	low	1.580258e+05	8.928460e+07
	Syrian Arab Republic	low	1.860083e+04	4.464200e+05
	Taiwan	low	4.563003e+04	7.483325e+06
	Tajikistan	low	9.900000e+03	2.970000e+04
	Thailand	low	5.851893e+04	5.559298e+06
	The former Yugoslav Republic of Macedonia	low	2.647594e+04	9.266580e+05
	Togo	low	5.656000e+03	1.696800e+04
	Trinidad and Tobago	low	3.805091e+04	4.185600e+05
	Tunisia	low	1.507070e+04	8.590300e+05
	Turkey	low	3.745031e+04	2.029807e+07
	Turkmenistan	low	1.350300e+04	5.401200e+04
	Uganda	low	2.566218e+04	8.468520e+05
	Ukraine	low	4.396813e+04	2.066502e+07
	United Arab Emirates	low	5.376466e+04	4.462467e+06
	United Kingdom of Great Britain and Northern Ireland	low	1.416886e+05	4.151475e+08
	United Republic of Tanzania	low	1.925408e+04	5.006060e+05
	United States of America	low	2.590624e+05	2.556428e+09
		medium	1.966112e+07	3.932225e+07
	Uruguay	low	5.085769e+04	5.746919e+06
	Uzbekistan	low	1.902983e+04	6.660440e+05
	Venezuela, Bolivarian Republic of...	low	2.246505e+04	1.392833e+06
	Viet Nam	low	1.995289e+04	2.953027e+06
	Yemen	low	5.628667e+03	3.377200e+04
	Zambia	low	1.991491e+04	2.190640e+05
	Zimbabwe	low	1.141477e+04	1.483920e+05

175 rows × 2 columns

In [17]: #Lambda Functions - anonymous function
#first using normal steps for addition here
def addition(a,b):
 return a+b
addition(2,9)

Out[17]: 11

In [18]: #Using Lambda function for the same number addition
add = **lambda** a,b:a+b
add(29,51)

Out[18]: 80

In [19]: #Checking if the input number is even
even=**lambda** a:a%2==0
even(22)

Out[19]: True

In [20]: even=**lambda** a:a%2==0
even(21)

Out[20]: False

In [28]: df_piv=pd.read_csv("sparktest_pivot.csv")
df_piv

Out[28]:

	start_year	name	dept	age	experience	salary
0	2021	Krish	Sales	31	10	30000
1	2021	Sudhanshu	Finance	30	8	25000
2	2022	Sunny	IT	29	4	20000
3	2022	Paul	Products	24	3	20000
4	2022	Harsha	Sales	21	1	15000
5	2022	Shubham	IT	23	2	18000
6	2019	Mahesh	Products	33	12	40000
7	2019	Akash	Finance	34	10	38000
8	2019	Arjun	Finance	36	9	32000

In []: #Pivot Table

In [35]: pivoted=pd.pivot_table(df_piv,index="start_year", values="salary")
pivoted

Out[35]:

	salary
start_year	
2019	36666.666667
2021	27500.000000
2022	18250.000000

In [41]: #Pivot Table using sum and mean filling 0 for none
`pivoted=pd.pivot_table(df_piv,index="dept", columns="start_year", values="salary",aggfunc=["sum","mean"],fill_value = 0)`
 pivoted

Out[41]:

	sum			mean		
start_year	2019	2021	2022	2019	2021	2022
dept						
Finance	70000	25000	0	35000	25000	0
IT	0	0	38000	0	0	19000
Products	40000	0	20000	40000	0	20000
Sales	0	30000	15000	0	30000	15000

In [47]: #Pivot Table using sum, filling 0 for none, and added Total column
`df1=pd.pivot_table(df_piv,index="dept", columns="start_year", values="salary", aggfunc="sum", margins=True,margins_name="Total",fill_value = 0)`
 pivoted

Out[47]:

	start_year	2019	2021	2022	Total
dept					
Finance	70000	25000	0	95000	
IT	0	0	38000	38000	
Products	40000	0	20000	60000	
Sales	0	30000	15000	45000	
Total	110000	55000	73000	238000	