```
import numpy as np
import pandas as pd

#load the dataset
data = pd.read_csv("/content/titanic.csv")
data.head()
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May	female	35.0	1	0	113803	53.1000	C123	S

```
data.shape
```

```
(891, 12)
```

```
data.describe()
```

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    object
 5   Age          714 non-null    float64
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Cabin        204 non-null    object
 11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

```
data.isnull().sum()
```

	0
PassengerId	0
Survived	0
Pclass	0
Name	0
Sex	0
Age	177
SibSp	0
Parch	0
Ticket	0
Fare	0
Cabin	687
Embarked	2

dtype: int64

```
data = data.drop(columns=['Name','Ticket'])
data.shape
```

```
(891, 10)
```

```
data.columns
```

```
Index(['PassengerId', 'Survived', 'Pclass', 'Sex', 'Age', 'SibSp', 'Parch',
       'Fare', 'Cabin', 'Embarked'],
      dtype='object')
```

```
data.isnull().sum()/data.shape[0]*100
```

	0
PassengerId	0.000000
Survived	0.000000
Pclass	0.000000
Sex	0.000000
Age	19.865320
SibSp	0.000000
Parch	0.000000
Fare	0.000000
Cabin	77.104377
Embarked	0.224467

dtype: float64

```
data=data.drop(columns='Cabin')
data.shape
```

```
(891, 9)
```

```
data.dropna(subset=['Embarked'],axis=0,inplace=True)
data.shape
```

```
(889, 9)
```

```
data=data.fillna(data.Age.mean())
data.isnull().sum()
```

	0
PassengerId	0
Survived	0
Pclass	0
Sex	0
Age	0
SibSp	0
Parch	0
Fare	0
Embarked	0

dtype: int64

Text Analysis over Stack Overflow dataset–> kaggle

```
!pip install Kaggle
```

```
Requirement already satisfied: Kaggle in /usr/local/lib/python3.11/dist-packages (1.7.4.5)
Requirement already satisfied: bleach in /usr/local/lib/python3.11/dist-packages (from Kaggle) (6.2.0)
Requirement already satisfied: certifi>=14.05.14 in /usr/local/lib/python3.11/dist-packages (from Kaggle) (2025.7.14)
Requirement already satisfied: charset-normalizer in /usr/local/lib/python3.11/dist-packages (from Kaggle) (3.4.2)
Requirement already satisfied: idna in /usr/local/lib/python3.11/dist-packages (from Kaggle) (3.10)
Requirement already satisfied: protobuf in /usr/local/lib/python3.11/dist-packages (from Kaggle) (5.29.5)
Requirement already satisfied: python-dateutil>=2.5.3 in /usr/local/lib/python3.11/dist-packages (from Kaggle) (2.9.0.post0)
Requirement already satisfied: python-slugify in /usr/local/lib/python3.11/dist-packages (from Kaggle) (8.0.4)
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from Kaggle) (2.32.3)
Requirement already satisfied: setuptools>=21.0.0 in /usr/local/lib/python3.11/dist-packages (from Kaggle) (75.2.0)
Requirement already satisfied: six>=1.10 in /usr/local/lib/python3.11/dist-packages (from Kaggle) (1.17.0)
Requirement already satisfied: text-unidecode in /usr/local/lib/python3.11/dist-packages (from Kaggle) (1.3)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from Kaggle) (4.67.1)
Requirement already satisfied: urllib3>=1.15.1 in /usr/local/lib/python3.11/dist-packages (from Kaggle) (2.4.0)
Requirement already satisfied: webencodings in /usr/local/lib/python3.11/dist-packages (from Kaggle) (0.5.1)
```

```
import os
os.environ['KAGGLE_CONFIG_DIR'] = "/content"
```

```
!kaggle datasets download stackoverflow/stack-overflow-2018-developer-survey
```

```
Warning: Your Kaggle API key is readable by other users on this system! To fix this, you can run 'chmod 600 /content/kaggle.json'
Dataset URL: https://www.kaggle.com/datasets/stackoverflow/stack-overflow-2018-developer-survey
License(s): DbCL-1.0
Downloading stack-overflow-2018-developer-survey.zip to /content
  0% 0.00/19.6M [00:00<?, ?B/s]
100% 19.6M/19.6M [00:00<00:00, 1.03GB/s]
```

```
 !unzip /content/stack-overflow-2018-developer-survey.zip
```

```
Archive:  /content/stack-overflow-2018-developer-survey.zip
  inflating: survey_results_public.csv
  inflating: survey_results_schema.csv
```

```
#import basic libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
df = pd.read_csv("/content/survey_results_public.csv")
df.shape
df.head()
```

```
/tmp/ipython-input-18-3914019911.py:1: DtypeWarning: Columns (8,12,13,14,15,16,50,51,52,53,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,
  df = pd.read_csv("/content/survey_results_public.csv")
```

	Respondent	Hobby	OpenSource	Country	Student	Employment	FormalEducation	UndergradMajor	CompanySize	DevType	...	Ex
0	1	Yes	No	Kenya	No	Employed part-time	Bachelor's degree (BA, BS, B.Eng., etc.)	Mathematics or statistics	20 to 99 employees	Full-stack developer	...	tir
1	3	Yes	Yes	United Kingdom	No	Employed full-time	Bachelor's degree (BA, BS, B.Eng., etc.)	A natural science (ex. biology, chemistry, phy...	10,000 or more employees	Database administrator;DevOps specialist;Full-...	...	ev
2	4	Yes	Yes	United States	No	Employed full-time	Associate degree	Computer science, computer engineering, or sof...	20 to 99 employees	Engineering manager;Full-stack developer	...	
3	5	No	No	United States	No	Employed full-time	Bachelor's degree (BA, BS, B.Eng., etc.)	Computer science, computer engineering, or sof...	100 to 499 employees	Full-stack developer	...	t e
4	7	Yes	No	South Africa	Yes, part-time	Employed full-time	Some college/university study without earning ...	Computer science, computer engineering, or sof...	10,000 or more employees	Data or business analyst;Desktop or enterprise...	...	tir

5 rows × 129 columns

```
df_1 = pd.read_csv("/content/survey_results_schema.csv")
df_1.shape
df_1.head()
```

	Column	QuestionText
0	Respondent	Randomized respondent ID number (not in order ...
1	Hobby	Do you code as a hobby?
2	OpenSource	Do you contribute to open source projects?
3	Country	In which country do you currently reside?
4	Student	Are you currently enrolled in a formal, degree...

```
df.shape
```

```
(98855, 129)
```

```
#Count the number of null values in each feacture
#Count the percentage of null values
#Draw the pie chart for the number of people who finds codding as hobby
#Determine the number of people contributing to open source projects
#Determine the top 20 countries where the resources are obtained
#Do other 5 analysis of own thinking (which involves different charts and graphs)



null_counts = df.isnull().sum()
print(null_counts)

df.shape
```

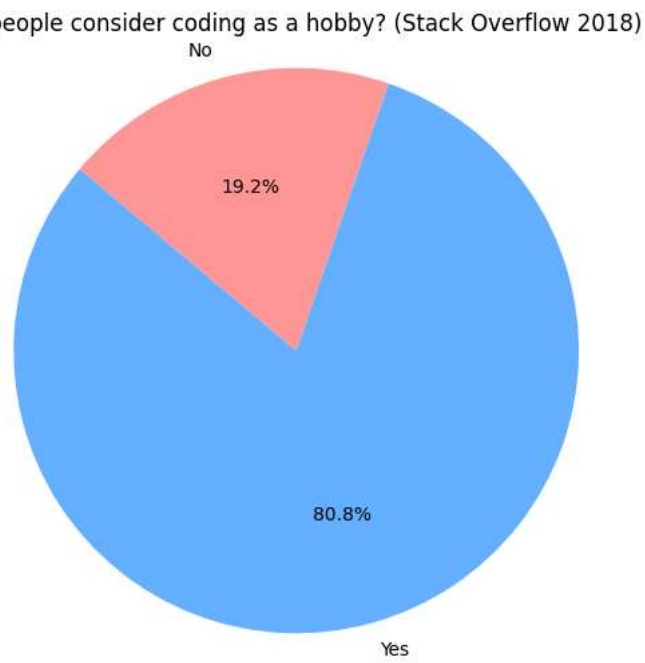
```
Respondent           0
Hobby                0
OpenSource           0
Country            412
Student           3954
                  ...
Age              34281
Dependents       36259
MilitaryUS       83074
SurveyTooLong    32914
SurveyEasy       32976
```

```
Length: 129, dtype: int64
(98855, 129)
```

```
null_percentage = (df.isnull().sum() / len(df)) * 100
print(null_percentage)
```

```
Respondent        0.000000
Hobby             0.000000
OpenSource        0.000000
Country           0.416772
Student           3.999798
                   ...
Age              34.678064
Dependents       36.678974
MilitaryUS       84.036215
SurveyTooLong    33.295230
SurveyEasy       33.357949
Length: 129, dtype: float64
```

```
hobby_counts = df['Hobby'].value_counts()

# Plot the pie chart
plt.figure(figsize=(6,6))
plt.pie(hobby_counts, labels=hobby_counts.index, autopct='%1.1f%%', colors=['#66b3ff', '#ff9999'], startangle=140)
plt.title("Do people consider coding as a hobby? (Stack Overflow 2018)")
plt.axis('equal')
plt.show()
print(df.columns)
```




```
Index(['Respondent', 'Hobby', 'OpenSource', 'Country', 'Student', 'Employment',
       'FormalEducation', 'UndergradMajor', 'CompanySize', 'DevType',
       ...
       'Exercise', 'Gender', 'SexualOrientation', 'EducationParents',
       'RaceEthnicity', 'Age', 'Dependents', 'MilitaryUS', 'SurveyTooLong',
       'SurveyEasy'],
      dtype='object', length=129)
```

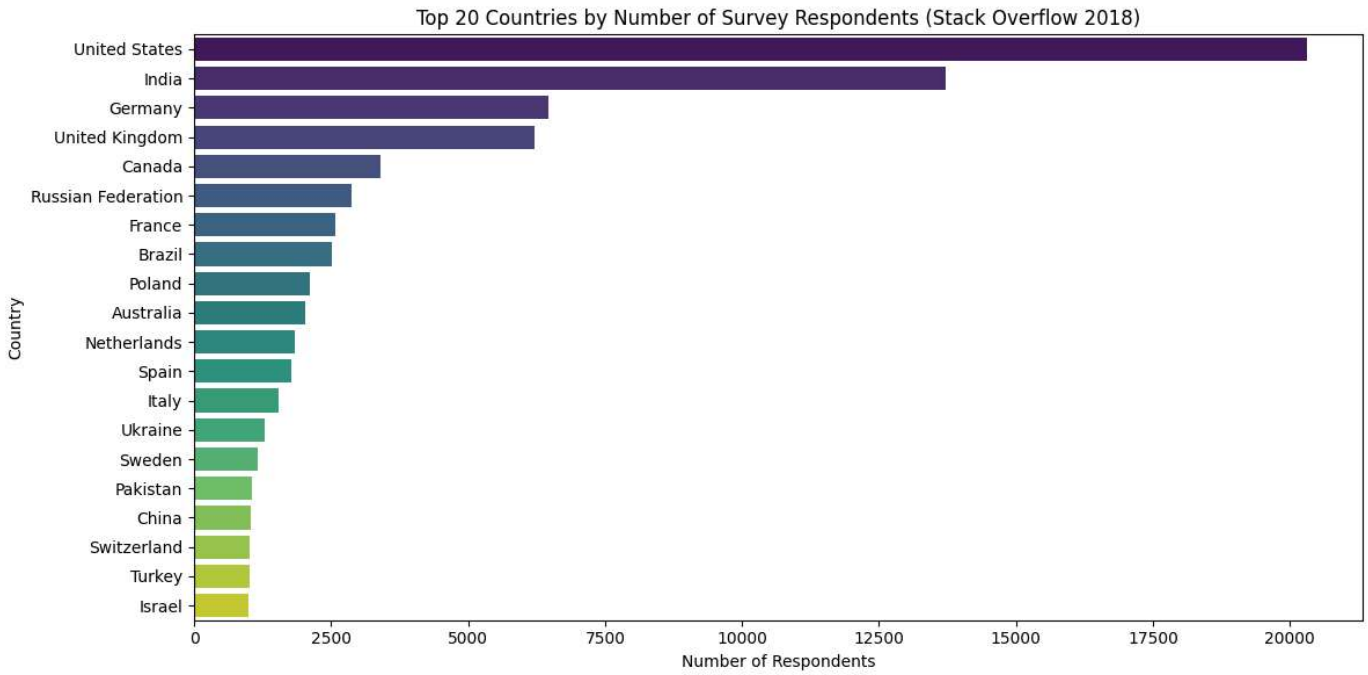
```
open_source_counts = df['OpenSource'].value_counts()
print(open_source_counts)
```

```
OpenSource
No     55769
Yes    43086
Name: count, dtype: int64
```

```
top_countries = df['Country'].value_counts().head(20)
print("Top 20 countries by number of respondents:")
print(top_countries)

plt.figure(figsize=(12, 6))
```

```
sns.barplot(x=top_countries.values, y=top_countries.index, palette="viridis")
plt.xlabel("Number of Respondents")
plt.ylabel("Country")
plt.title("Top 20 Countries by Number of Survey Respondents (Stack Overflow 2018)")
plt.tight_layout()
plt.show()
```

```
Top 20 countries by number of respondents:
Country
United States         20309
India                 13721
Germany                6459
United Kingdom         6221
Canada                 3393
Russian Federation     2869
France                 2572
Brazil                 2505
Poland                 2122
Australia              2018
Netherlands            1841
Spain                  1769
Italy                  1535
Ukraine                1279
Sweden                 1164
Pakistan               1050
China                  1037
Switzerland            1010
Turkey                 1004
Israel                 1003
Name: count, dtype: int64
/tmp/ipython-input-30-1501666556.py:6: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `lege

  sns.barplot(x=top_countries.values, y=top_countries.index, palette="viridis")
```

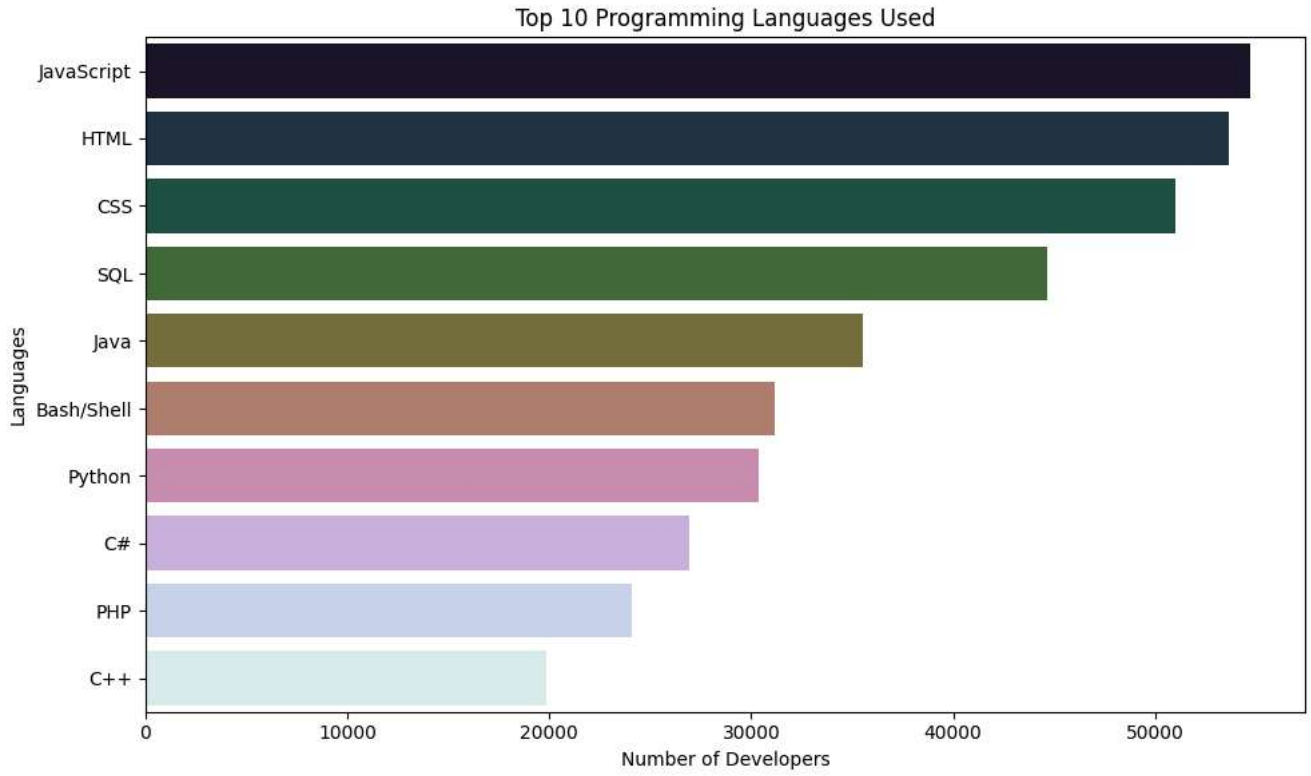


1.Which programming language is most popular?

```
from collections import Counter

lang_series = df['LanguageWorkedWith'].dropna().str.split(';')
all_languages = Counter([lang for sublist in lang_series for lang in sublist])

top_langs = pd.Series(dict(all_languages)).sort_values(ascending=False).head(10)

plt.figure(figsize=(10,6))
sns.barplot(x=top_langs.values, y=top_langs.index, palette="cubehelix")
```

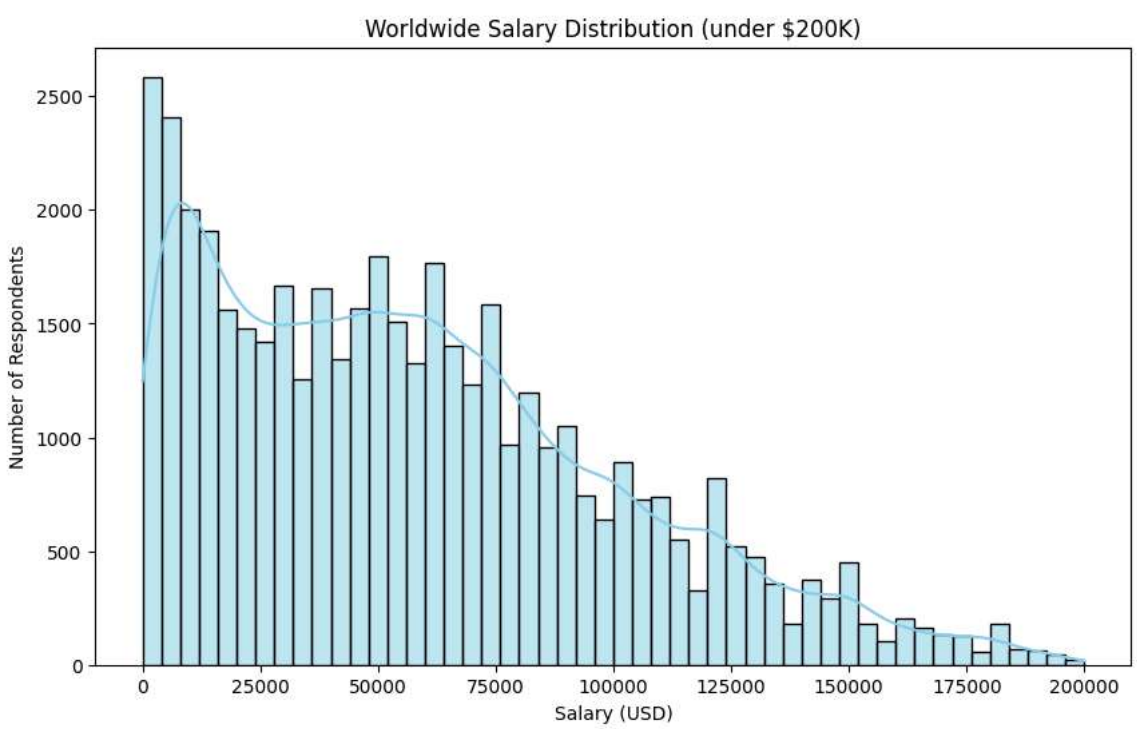
```
plt.title("Top 10 Programming Languages Used")
plt.xlabel("Number of Developers")
plt.ylabel("Languages")
plt.tight_layout()
plt.show()A
```

```
/tmp/ipython-input-32-3636385984.py:9: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legenc

  sns.barplot(x=top_langs.values, y=top_langs.index, palette="cubehelix")
```



2.Salary Distribution

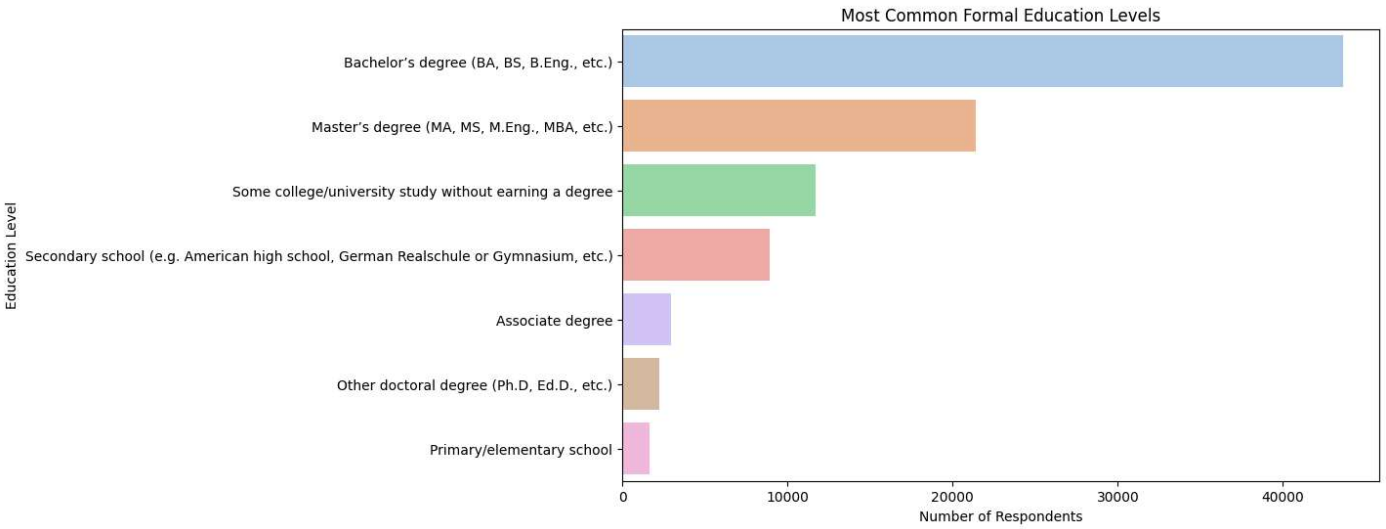
```
salary = df['ConvertedSalary'].dropna()
salary = salary[salary < 200000]  # Remove outliers above $200K

plt.figure(figsize=(10,6))
sns.histplot(salary, bins=50, kde=True, color="skyblue")
plt.title("Worldwide Salary Distribution (under $200K)")
plt.xlabel("Salary (USD)")
plt.ylabel("Number of Respondents")
plt.show()
```



3. Which Formal Education Level is Most Common?

```
edu_counts = df['FormalEducation'].value_counts().head(7)

plt.figure(figsize=(10,6))
sns.barplot(x=edu_counts.values, y=edu_counts.index, palette="pastel")
plt.title("Most Common Formal Education Levels")
plt.xlabel("Number of Respondents")
plt.ylabel("Education Level")
plt.show()
```

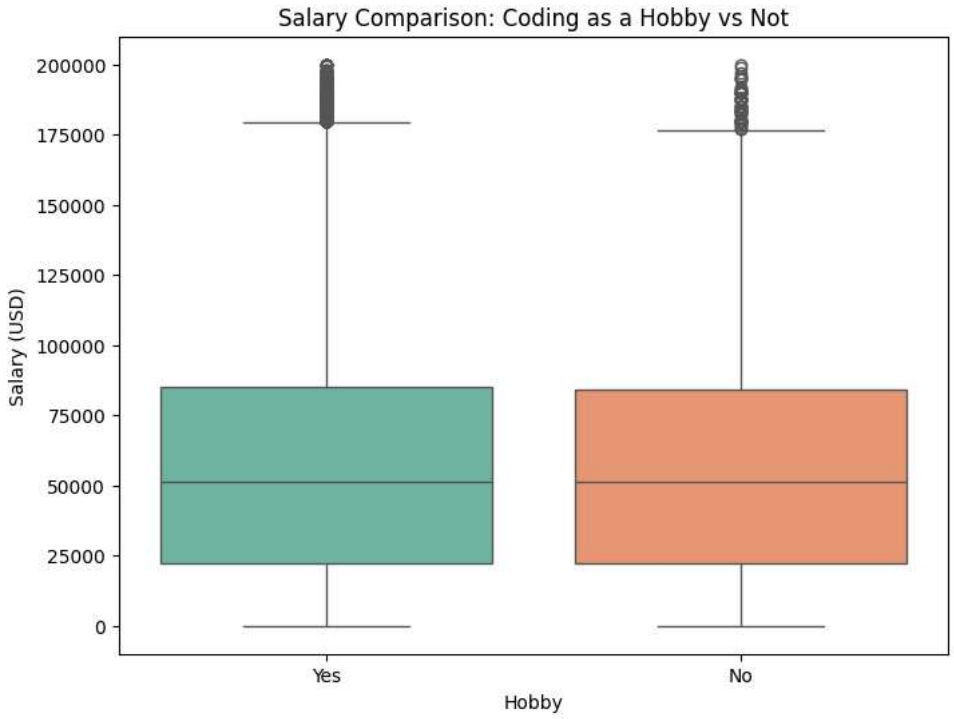
```
/tmp/ipython-input-34-1444516669.py:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legenc

  sns.barplot(x=edu_counts.values, y=edu_counts.index, palette="pastel")
```



4. Do Developers Who Code as Hobby Earn More on Average?

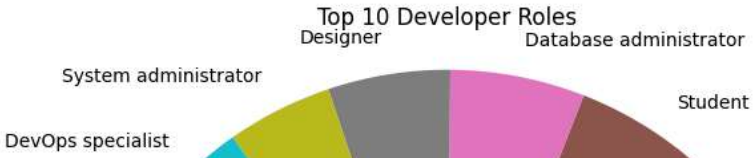
```
hobby_salary = df[['Hobby', 'ConvertedSalary']].dropna()
hobby_salary = hobby_salary[hobby_salary['ConvertedSalary'] < 200000]


plt.figure(figsize=(8,6))
sns.boxplot(x='Hobby', y='ConvertedSalary', data=hobby_salary, palette="Set2")
plt.title("Salary Comparison: Coding as a Hobby vs Not")
plt.xlabel("Hobby")
plt.ylabel("Salary (USD)")
plt.show()
```

```
/tmp/ipython-input-35-348128815.py:6: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend

  sns.boxplot(x='Hobby', y='ConvertedSalary', data=hobby_salary, palette="Set2")
```



5. Which Developer Role is Most Common?

```
# Count developer roles
roles_series = df['DevType'].dropna().str.split(';')
all_roles = Counter([role for sublist in roles_series for role in sublist])
top_roles = pd.Series(dict(all_roles)).sort_values(ascending=False).head(10)

plt.figure(figsize=(8,8))
plt.pie(top_roles.values, labels=top_roles.index, autopct='%1.1f%%', startangle=140)
plt.title("Top 10 Developer Roles")
plt.axis('equal')
plt.show()
```


Top 10 Developer Roles
Designer
Database administrator
System administrator
Student
DevOps specialist