In [39]:

```
# Import
import random
import numpy as np
import pandas as pd
import sqlite3
```

In [40]:

```
adult_data_df = pd.read_csv('https://archive.ics.uci.edu/ml/machine-learning-data
bases/adult/adult.data')
display(adult_data_df.head(3))
```

	39	State-gov	77516	Bachelors	13	Never-married	Adm-clerical	Not-in-family	White	Male	217
0	50	Self-emp-not-inc	83311	Bachelors	13	Married-civ-spouse	Exec-managerial	Husband	White	Male	0
1	38	Private	215646	HS-grad	9	Divorced	Handlers-cleaners	Not-in-family	White	Male	0
2	53	Private	234721	11th	7	Married-civ-spouse	Handlers-cleaners	Husband	Black	Male	0

In [41]:

```
adult_data_df.columns =["age","workclass","fnlwgt","education","education_num","m
arital_status","occupation","relationship","race","sex","capital_gain","capital_l
oss","hours_per_week","native_country","income"]
display(adult_data_df.head(3))
```

	age	workclass	fnlwgt	education	education_num	marital_status	occupation	rel
0	50	Self-emp-not-inc	83311	Bachelors	13	Married-civ-spouse	Exec-managerial	Hu
1	38	Private	215646	HS-grad	9	Divorced	Handlers-cleaners	No far
2	53	Private	234721	11th	7	Married-civ-spouse	Handlers-cleaners	Hu

In [42]:

```
import sqlalchemy

from sqlalchemy import create_engine

engine = create_engine('sqlite:///sqladb', echo=False)
```

In [43]:

```
adult_data_df.to_sql('sqladb', engine, if_exists='replace')
```

In [44]:

```
connection = sqlite3.connect("sqladb")
cursor = connection.cursor()
```

In [45]:

```
cursor.execute('UPDATE sqladb SET fnlwgt = "7777" WHERE fnlwgt = " 83311"')
print(pd.read_sql_query("SELECT * FROM sqladb", connection).head(2))
```

```
   index  age          workclass  fnlwgt   education  education_num  \
0      0   50   Self-emp-not-inc    7777   Bachelors             13
1      1   38            Private  215646     HS-grad              9

       marital_status          occupation    relationship    race
sex  \
0   Married-civ-spouse     Exec-managerial         Husband   White   M
ale
1             Divorced   Handlers-cleaners   Not-in-family   White   M
ale

   capital_gain  capital_loss  hours_per_week  native_country  income
0             0             0              13   United-States   <=50K
1             0             0              40   United-States   <=50K
```

In [46]:

```
cursor.execute('UPDATE sqladb SET education = "High_School" WHERE education = " H
S-grad"')
print(pd.read_sql_query("SELECT * FROM sqladb", connection).tail(7))
```

	index	age	workclass	fnlwgt	education	education_num
32553	32553	53	Private	321865	Masters	14
32554	32554	22	Private	310152	Some-college	10
32555	32555	27	Private	257302	Assoc-acdm	12
32556	32556	40	Private	154374	High_School	9
32557	32557	58	Private	151910	High_School	9
32558	32558	22	Private	201490	High_School	9
32559	32559	52	Self-emp-inc	287927	High_School	9

	marital_status	occupation	relationship	race
32553	Married-civ-spouse	Exec-managerial	Husband	White
32554	Never-married	Protective-serv	Not-in-family	White
32555	Married-civ-spouse	Tech-support	Wife	White
32556	Married-civ-spouse	Machine-op-inspct	Husband	White
32557	Widowed	Adm-clerical	Unmarried	White
32558	Never-married	Adm-clerical	Own-child	White
32559	Married-civ-spouse	Exec-managerial	Wife	White

	sex	capital_gain	capital_loss	hours_per_week	native_country
32553	Male	0	0	40	United-States
32554	Male	0	0	40	United-States
32555	Female	0	0	38	United-States
32556	Male	0	0	40	United-States
32557	Female	0	0	40	United-States
32558	Male	0	0	20	United-States
32559	Female	15024	0	40	United-States

	income
32553	>50K
32554	<=50K
32555	<=50K
32556	>50K
32557	<=50K
32558	<=50K
32559	>50K

In [47]:

```
cursor.execute('DELETE FROM sqladb WHERE fnlwgt = " 7777"')
print(pd.read_sql_query("SELECT * FROM sqladb", connection).head(2))
```

```
   index  age workclass  fnlwgt    education  education_num  \
0      1   38   Private  215646  High_School              9
1      2   53   Private  234721         11th              7

       marital_status          occupation    relationship    race
sex  \
0            Divorced   Handlers-cleaners   Not-in-family   White   M
ale
1   Married-civ-spouse   Handlers-cleaners         Husband   Black   M
ale

   capital_gain  capital_loss  hours_per_week  native_country  income
0             0             0              40   United-States   <=50K
1             0             0              40   United-States   <=50K
```

In [48]:

```
cursor.execute('DELETE FROM sqladb WHERE age = " 38" AND fnlwgt = " 215646" and r
ace = " White" and hours_per_week > 39')
print(pd.read_sql_query("SELECT * FROM sqladb", connection).head(2))
```

```
   index  age workclass  fnlwgt   education  education_num  \
0      2   53   Private  234721         11th              7
1      3   28   Private  338409   Bachelors              13

       marital_status          occupation relationship    race      s
ex  \
0   Married-civ-spouse   Handlers-cleaners      Husband   Black     Ma
le
1   Married-civ-spouse      Prof-specialty         Wife   Black   Fema
le

   capital_gain  capital_loss  hours_per_week  native_country  income
0             0             0              40   United-States   <=50K
1             0             0              40            Cuba   <=50K
```

In [49]:

```
cursor.execute('SELECT DISTINCT * FROM sqladb WHERE relationship = " Wife" AND ag
e < 30 AND workclass = " Private" and native_country=" India"')
output = cursor.fetchall()
print(output)
```

```
[(891, 28, ' Private', 164170, ' Assoc-voc', 11, ' Married-civ-spouse'
, ' Adm-clerical', ' Wife', ' Asian-Pac-Islander', ' Female', 0, 0, 40
, ' India', ' <=50K'), (30832, 25, ' Private', 110978, ' Assoc-acdm',
12, ' Married-civ-spouse', ' Adm-clerical', ' Wife', ' Asian-Pac-Islan
der', ' Female', 0, 0, 37, ' India', ' >50K')]
```

In [50]:

```
cursor.execute('SELECT * FROM sqladb WHERE relationship = " Unmarried" AND age >
21 AND age < 30 AND sex = " Female" AND native_country=" Mexico"')
output = cursor.fetchall()
print(output)
```

```
[(4561, 29, ' Private', 370494, 'High_School', 9, ' Never-married', '
Other-service', ' Unmarried', ' White', ' Female', 0, 0, 40, ' Mexico'
, ' <=50K'), (6520, 28, ' ?', 201844, 'High_School', 9, ' Separated',
' ?', ' Unmarried', ' White', ' Female', 0, 0, 40, ' Mexico', ' <=50K'
), (8984, 28, ' ?', 196630, ' Assoc-voc', 11, ' Separated', ' ?', ' Un
married', ' White', ' Female', 0, 0, 40, ' Mexico', ' <=50K'), (10606,
25, ' Private', 204219, 'High_School', 9, ' Never-married', ' Adm-cler
ical', ' Unmarried', ' White', ' Female', 0, 0, 40, ' Mexico', ' <=50K
'), (12047, 22, ' Private', 353039, 'High_School', 9, ' Never-married'
, ' Craft-repair', ' Unmarried', ' White', ' Female', 0, 0, 36, ' Mexi
co', ' <=50K'), (13955, 23, ' Private', 218445, ' 5th-6th', 3, ' Never
-married', ' Priv-house-serv', ' Unmarried', ' White', ' Female', 0, 0
, 12, ' Mexico', ' <=50K'), (16345, 22, ' ?', 214238, ' 7th-8th', 4, '
Never-married', ' ?', ' Unmarried', ' White', ' Female', 0, 0, 40, ' M
exico', ' <=50K'), (24516, 22, ' Private', 213902, 'High_School', 9, '
Never-married', ' Adm-clerical', ' Unmarried', ' White', ' Female', 0,
0, 40, ' Mexico', ' <=50K'), (26675, 29, ' Private', 84366, ' 10th', 6
, ' Married-spouse-absent', ' Adm-clerical', ' Unmarried', ' White', '
Female', 0, 0, 40, ' Mexico', ' <=50K'), (26717, 22, ' Private', 17632
1, ' 7th-8th', 4, ' Never-married', ' Other-service', ' Unmarried', '
White', ' Female', 0, 0, 40, ' Mexico', ' <=50K'), (27878, 28, ' Priva
te', 261725, 'High_School', 9, ' Never-married', ' Other-service', ' U
nmarried', ' White', ' Female', 0, 0, 40, ' Mexico', ' <=50K'), (29370
, 24, ' Private', 86065, 'High_School', 9, ' Never-married', ' Transpo
rt-moving', ' Unmarried', ' White', ' Female', 0, 0, 40, ' Mexico', '
<=50K'), (31101, 27, ' Private', 363053, ' 9th', 5, ' Never-married',
' Priv-house-serv', ' Unmarried', ' White', ' Female', 0, 0, 24, ' Mex
ico', ' <=50K')]
```

In [52]:

```
def new_entry(db_file, new_data):

    query = "INSERT INTO sqladb VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?,
?, ?);"
    cursor.close()
    connection.close()

new_entry('sqladb',('32557', '50','Private', '384675', 'HS-grad', '9', 'Divorced'
, 'Executive', 'Not-in-family', 'White', 'Male', '0', '0', '40', 'United-States',
'>=50K'))
```

In [ ]:

In [53]:

```
def age_check():
    connection = sqlite3.connect("sqladb")
    cursor = connection.cursor()
    cursor.execute('SELECT avg(age) FROM sqladb WHERE marital_status=" Never-marr
ied" AND sex=" Female"')
    output = cursor.fetchall()
    print(output)
    connection.close()

age_check()
```

```
[(28.12691420180407,)]
```

In [ ]:

```
connection.close()
```