CSE 250 Coding Challenge

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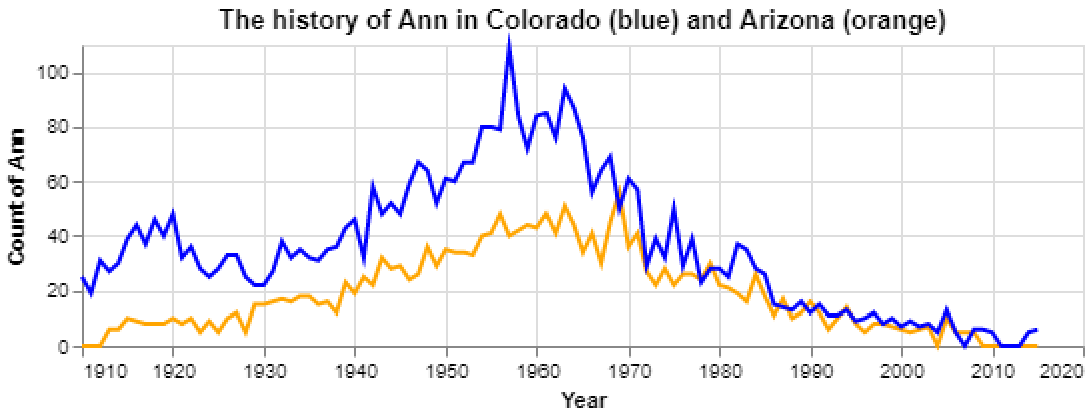
Challenge Summary

I answered every challenge question. The only thing I did not get done was the year line on the Ann chart.

Challenge 1

Answer:



Challenge 2

Answer:

	year	id_total	total	percent
0	1978	14460	2.45557e+06	0.588866
1	1979	14924.5	2.55866e+06	0.583293
2	1980	15278.5	2.64366e+06	0.57793
3	1977	13977	2.46175e+06	0.567766
4	1981	14897.5	2.64723e+06	0.562758

Challenge 3

Answer:

	0
0	229.524
1	18
2	22
3	45
4	31
5	229.524
6	85
7	38
8	129
9	800
10	22
11	5

Challenge 4

Answer: 0.9223192019950125

code to make model:

```
x_train, x_test, y_train, y_test = train_test_split(
features,
target,
test_size = .35,
random_state = 2021)

# create a classification model
classifier_RF = RandomForestClassifier()
# train the model
classifier_RF.fit(x_train, y_train)
# use your model to make predictions!
y_predicted = classifier_RF.predict(x_test)
# test how accurate those predictions are
metrics.accuracy_score(y_test, y_predicted)
```

Challenge 5

Answer: Change some column values

One column we would need to change is birth_decade because the year range is currently strings. I will change the year range to the first year in the range. The other columns we need to change are house and ancestry. I will change the values to numbers.

changed year range:

```
new_hp = hp
new_year = (new_hp.birth_decade
    .str.replace("\$|,|\+", "")
    .str.split("-", expand=True)
    .rename(columns = {0:'range'})
    .astype('float')
    .range
)
```

changed house values:

```
new_house = (new_hp.house.
        str.replace('Gryffindor', '1').
        str.replace('Hufflepuff', '2').
        str.replace('Ravenclaw', '3').
        str.replace('Slytherin', '4').
        # rename(columns = {0:'new_house'})
        astype('float'))
```

changed ancestry values:

```
new_ancestry = (new_hp.ancestry.
        str.replace('pure-blood', '1').
        str.replace('half-blood', '2').
        str.replace('muggleborn', '3').
        astype('float'))
```

Code

```
 # %%
import pandas as pd
import altair as alt
import numpy as np

from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn import metrics

# %%
url_names = 'https://github.com/byuidatascience/data4names/raw/master/data-raw/names_year/names_

dat_names = pd.read_csv(url_names)

# %% [markdown]
# ### Challenge 1

# %%
ann = dat_names.query('name == "Ann"')
# print(ann)
# ann.filter('name, year, AZ')

# %%
ann_az = (ann
.groupby('year')
.agg(az_total = ('AZ', sum)
)
# .assign(another_column_can_make = lambda x: function goes here)
.reset_index()
)
ann_az

# %%
ann_co = (ann
.groupby('year')
.agg(co_total = ('CO', sum)
)
# .assign(another_column_can_make = lambda x: function goes here)
.reset_index()
)
ann_co

# %%
chart_az = (alt.Chart(ann_az)
    .mark_line(color='orange')
    .encode(x = alt.X('year', axis = alt.Axis(format = 'd', title = 'Year')),
            y = alt.Y('az_total', axis=alt.Axis(title = 'Count of Ann')))
    .properties(
        height = 150,
        width = 500,
        title = {'text': 'The history of Ann in Colorado (blue) and Arizona (orange)'}
    )
)
chart_az

# %%
chart_co = (alt.Chart(ann_co)
    .mark_line(color='blue')
    .encode(x = alt.X('year', axis = alt.Axis(format = 'd', title = 'Year')),
            y = alt.Y('co_total', axis=alt.Axis(title = 'Count of Ann')))
    .properties(
        height = 150,
        width = 500,
        title = {'text': 'The history of Ann in Colorado (blue) and Arizona (orange)'}
    )
)
chart_co

# %%
chart_az + chart_co

# %% [markdown]
# ### Challenge 2

# %%
chal_2 = (dat_names
.groupby('year')
.agg(id_total = ('ID', sum),
    total = ('Total', sum)
)
.assign(percent = lambda x: (x.id_total / x.total)*100)
.sort_values(by = 'percent', ascending = False)
.reset_index()
)
first5 = chal_2.head(5)
print(first5.to_markdown())

# %% [markdown]
# ### Challenge 3

# %%
bob = pd.Series([np.nan, 18, 22, 45, 31, np.nan, 85, 38, 129, 800, 22, 5])
dev = bob.dropna()
st_dev = np.std(dev)
chal3 = bob.replace(np.nan, st_dev)
print(chal3.to_markdown())

# %% [markdown]
# ### Challenge 4

# %%
```

```
dwellings_ml = pd.read_csv("https://github.com/byuidatascience/data4dwellings/raw/master/data-ra

features = dwellings_ml.drop(['numbaths','parcel'], axis = 1)
target = (dwellings_ml.numbaths > 2)*1

# %%
x_train, x_test, y_train, y_test = train_test_split(
features,
target,
test_size = .35,
random_state = 2021)

# %%
# create a classification model
classifier_RF = RandomForestClassifier()
# train the model
classifier_RF.fit(x_train, y_train)
# use your model to make predictions!
y_predicted = classifier_RF.predict(x_test)
# test how accurate those predictions are
metrics.accuracy_score(y_test, y_predicted)


# %% [markdown]
# ### Challenge 5

# %%
hp = pd.DataFrame({'name': ['Harry Potter','Hermione Granger','Ron Weasley','Draco Malfoy','Mine

hp

# %%
new_hp = hp
new_house = (new_hp.house.
        str.replace('Gryffindor', '1').
        str.replace('Hufflepuff', '2').
        str.replace('Ravenclaw', '3').
        str.replace('Slytherin', '4').
        # rename(columns = {0:'new_house'})
        astype('float'))
new_house

# %%
new_year = (new_hp.birth_decade
    .str.replace("\$|,|\+", "")
    .str.split("-", expand=True)
    .rename(columns = {0:'range'})
    .astype('float')
    .range
)
new_year
```

```
# %%
new_ancestry = (new_hp.ancestry.
        str.replace('pure-blood', '1').
        str.replace('half-blood', '2').
        str.replace('muggleborn', '3').
        astype('float'))
new_ancestry
```