Data Setup

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error, mean_absolute_error, r2_score

rawData = "https://raw.githubusercontent.com/Rwyld/Data-Science-Models/main/Modelos/Random%20Forest/TemperaturasCSV.csv"

data = pd.read_csv(rawData)

data = data.drop(['year','forecast_noaa',   'forecast_acc', 'forecast_under'], axis=1)
data.head(3)
```

	month	day	week	temp_2	temp_1	average	actual	friend
0	1	1	Fri	45	45	45.6	45	29
1	1	2	Sat	44	45	45.7	44	61
2	1	3	Sun	45	44	45.8	41	56

Analisis Descriptivo

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 348 entries, 0 to 347
Data columns (total 8 columns):
 #   Column   Non-Null Count  Dtype
---  ------   --------------  -----
 0   month    348 non-null    int64
 1   day      348 non-null    int64
 2   week     348 non-null    object
 3   temp_2   348 non-null    int64
 4   temp_1   348 non-null    int64
 5   average  348 non-null    float64
 6   actual   348 non-null    int64
 7   friend   348 non-null    int64
dtypes: float64(1), int64(6), object(1)
memory usage: 21.9+ KB
```

```
data.describe()
```

	month	day	temp_2	temp_1	average	actual	friend
count	348.000000	348.000000	348.000000	348.000000	348.000000	348.000000	348.000000
mean	6.477011	15.514368	62.652299	62.701149	59.760632	62.543103	60.034483
std	3.498380	8.772982	12.165398	12.120542	10.527306	11.794146	15.626179
min	1.000000	1.000000	35.000000	35.000000	45.100000	35.000000	28.000000
25%	3.000000	8.000000	54.000000	54.000000	49.975000	54.000000	47.750000
50%	6.000000	15.000000	62.500000	62.500000	58.200000	62.500000	60.000000
75%	10.000000	23.000000	71.000000	71.000000	69.025000	71.000000	71.000000
max	12.000000	31.000000	117.000000	117.000000	77.400000	92.000000	95.000000

Faltan 17 datos, y hay datos maximos de temp_1 y temp_2

```
data = data.drop(data[data['temp_1'] > 100].index)
data = data.drop(data[data['temp_2'] > 100].index)
data.describe()
```

	month	day	temp_2	temp_1	average	actual	friend	w
count	346.000000	346.000000	346.000000	346.000000	346.000000	346.000000	346.000000	34
mean	6.453757	15.511561	62.488439	62.554913	59.790173	62.569364	60.026012	
std	3.494824	8.723856	11.842744	11.796273	10.550556	11.822949	15.670961	
min	1.000000	1.000000	35.000000	35.000000	45.100000	35.000000	28.000000	
25%	3.000000	8.000000	54.000000	54.000000	49.925000	54.000000	47.250000	
50%	6.000000	15.000000	62.000000	62.500000	58.350000	63.000000	60.000000	
75%	10.000000	23.000000	71.000000	71.000000	69.075000	71.000000	71.000000	
max	12.000000	31.000000	92.000000	92.000000	77.400000	92.000000	95.000000	

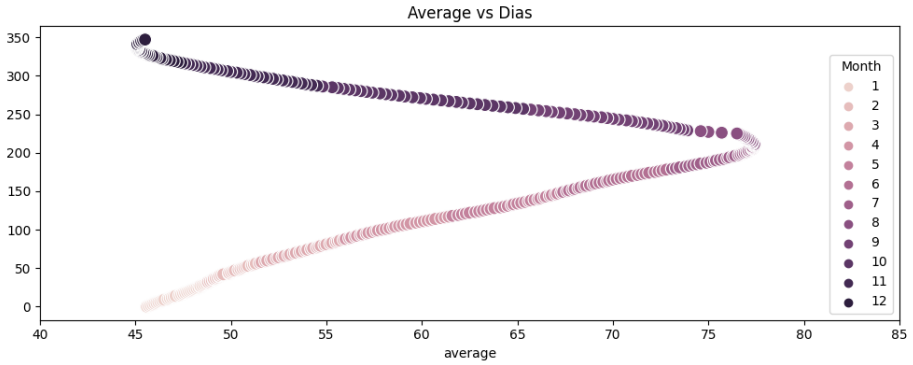
```
data.head()
```

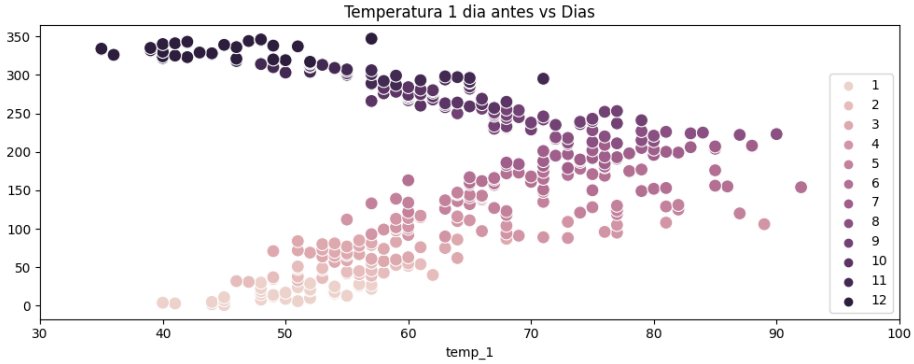
	month	day	week	temp_2	temp_1	average	actual	friend
0	1	1	Fri	45	45	45.6	45	29
1	1	2	Sat	44	45	45.7	44	61
2	1	3	Sun	45	44	45.8	41	56
3	1	4	Mon	44	41	45.9	40	53
4	1	5	Tues	41	40	46.0	44	41

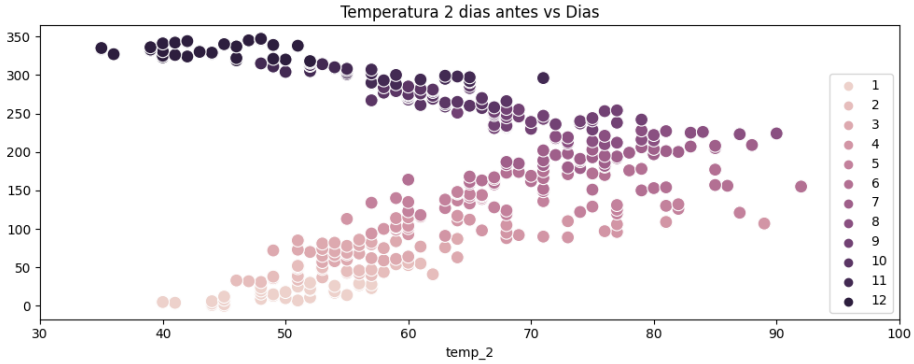
```
data.tail()
```

	month	day	week	temp_2	temp_1	average	actual	friend
343	12	27	Tues	42	42	45.2	47	47
344	12	28	Wed	42	47	45.3	48	58
345	12	29	Thurs	47	48	45.3	48	65
346	12	30	Fri	48	48	45.4	57	42
347	12	31	Sat	48	57	45.5	40	57

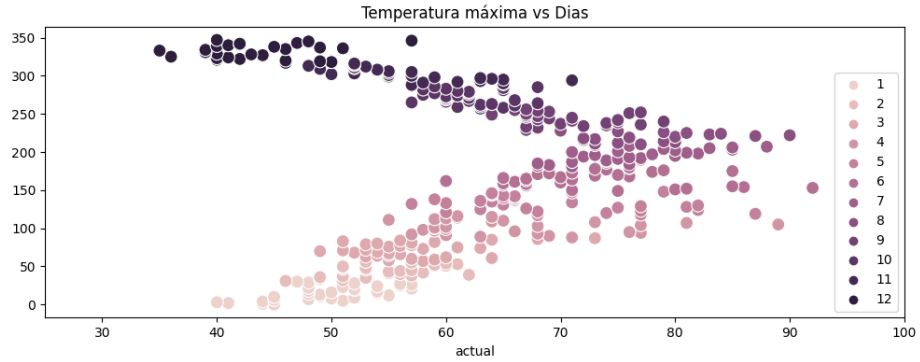
```
fig, axe = plt.subplots(3,1, figsize=(10,12))

sns.scatterplot(data=data, x='average', y=data.index, hue='month', legend='full', s=100, ax=axe[0])
axe[0].legend(loc='lower right', title='Month')
axe[0].set_xlim(40, 85)
axe[0].set_title("Average vs Dias")

sns.scatterplot(data=data, x='temp_1', y=data.index, hue='month', legend='full', s=100, ax=axe[1])
axe[1].legend(loc='lower right')
axe[1].set_xlim(30, 100)
axe[1].set_title("Temperatura 1 dia antes vs Dias")

sns.scatterplot(data=data, x='temp_2', y=data.index, hue='month', legend='full', s=100, ax=axe[2])
axe[2].legend(loc='lower right')
axe[2].set_xlim(30, 100)
axe[2].set_title("Temperatura 2 dias antes vs Dias")

plt.tight_layout()
plt.show()
```

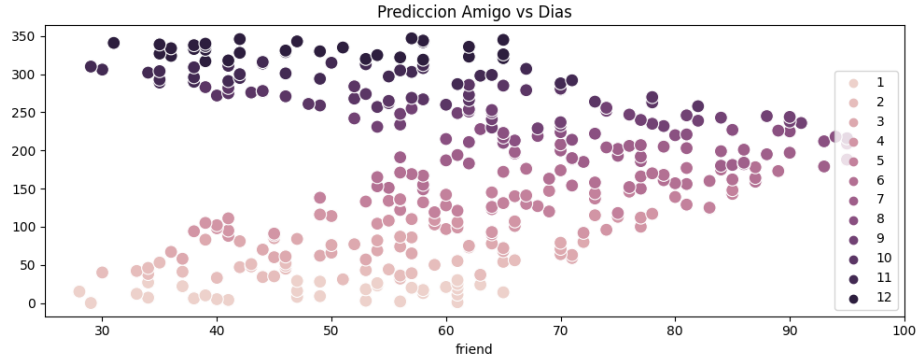







```
fig, axe = plt.subplots(2,1, figsize=(10,8))

sns.scatterplot(data=data, x='actual', y=data.index, hue='month', legend='full', s=100, ax=axe[0])
axe[0].legend(loc='lower right')
axe[0].set_xlim(25, 100)
axe[0].set_title("Temperatura máxima vs Dias")

sns.scatterplot(data=data, x='friend', y=data.index, hue='month', legend='full', s=100, ax=axe[1])
axe[1].legend(loc='lower right')
axe[1].set_xlim(25, 100)
axe[1].set_title("Prediccion Amigo vs Dias")

plt.tight_layout()
plt.show()
```





Se confirma la perdida de datos Datos de Friend son mas dispersos en comparacion a los demas, que son similares entre si, siendo que los datos actuales difieren un poco con las temp 1 y 2

Preparacion de data

```
data = pd.get_dummies(data, columns=['week'])
display(data)
```

	month	day	temp_2	temp_1	average	actual	friend	week_Fri	week_Mon	week_Sat	wee
0	1	1	45	45	45.6	45	29	1	0	0	
1	1	2	44	45	45.7	44	61	0	0	1	
2	1	3	45	44	45.8	41	56	0	0	0	
3	1	4	44	41	45.9	40	53	0	1	0	
4	1	5	41	40	46.0	44	41	0	0	0	
...	...	...	...	...	...	...	...	...	...	...	
343	12	27	42	42	45.2	47	47	0	0	0	
344	12	28	42	47	45.3	48	58	0	0	0	
345	12	29	47	48	45.3	48	65	0	0	0	
346	12	30	48	48	45.4	57	42	1	0	0	
347	12	31	48	57	45.5	40	57	0	0	1	

348 rows × 14 columns

```
data = data.astype(float)
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 348 entries, 0 to 347
Data columns (total 14 columns):
 #   Column      Non-Null Count  Dtype  
---  ------      --------------  -----  
 0   month       348 non-null    float64
 1   day         348 non-null    float64
 2   temp_2      348 non-null    float64
 3   temp_1      348 non-null    float64
 4   average     348 non-null    float64
 5   actual      348 non-null    float64
 6   friend      348 non-null    float64
 7   week_Fri    348 non-null    float64
 8   week_Mon    348 non-null    float64
 9   week_Sat    348 non-null    float64
 10  week_Sun    348 non-null    float64
 11  week_Thurs  348 non-null    float64
 12  week_Tues   348 non-null    float64
 13  week_Wed    348 non-null    float64
dtypes: float64(14)
memory usage: 38.2 KB
```

```
X = data.drop(['actual'], axis=1)
y = data['actual']

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.75, random_state = 42)
```

```
tempMax = np.mean(y_train)

baseline = np.full_like(y_test, tempMax)
mse = mean_squared_error(y_test, baseline)

print(mse)
```

```
138.39208173690932
```

La linea de base tiene un error cuadratico medio de 138.16912884303366, lo que se podria interpretar que las temperaturas varian en los diferentes dias del año, obteniendo asi este altisimo resultado en el error

Ajuste del Modelo

```
rf = RandomForestRegressor(n_estimators=1000, random_state=42)

rf.fit(X_train, y_train)
```

```
RandomForestRegressor(n_estimators=1000, random_state=42)
```

```
y_pred = rf.predict(X_test)
```