

# Between Numbers and Nature:

Unraveling Fernando de Noronha Through Data

**Fernando de Noronha is a Brazilian archipelago in the state of Pernambuco. Comprising 21 islands, islets, and volcanic rocks, it covers a total area of 26 km<sup>2</sup> — with the main island occupying 17 km<sup>2</sup>. Located in the Atlantic Ocean to the northeast of mainland Brazil, it is 545 km away from the state capital, Recife.”**



## ► Analysis Objectives:

The main objectives of the study are:

- To verify if the number of homicides and dengue cases in Brazilian states impact the number of visitors to the island;
- To determine which countries send the most tourists to the island.



## ► Data Source

- The data was provided by the Island Administration, which is part of the Government of Pernambuco ([www.noronha.pe.gov.br](http://www.noronha.pe.gov.br)).
- The dataset consists of 10,668 observations. Additionally, dengue data was collected from datasus, homicide data from states through the Mortality Information System, and GDP data from the Brazilian Institute of Geography and Statistics.
- The combination of these datasets forms a panel dataset covering the period from 2010 to 2016.

Observations

**10,668**

Features

**13**

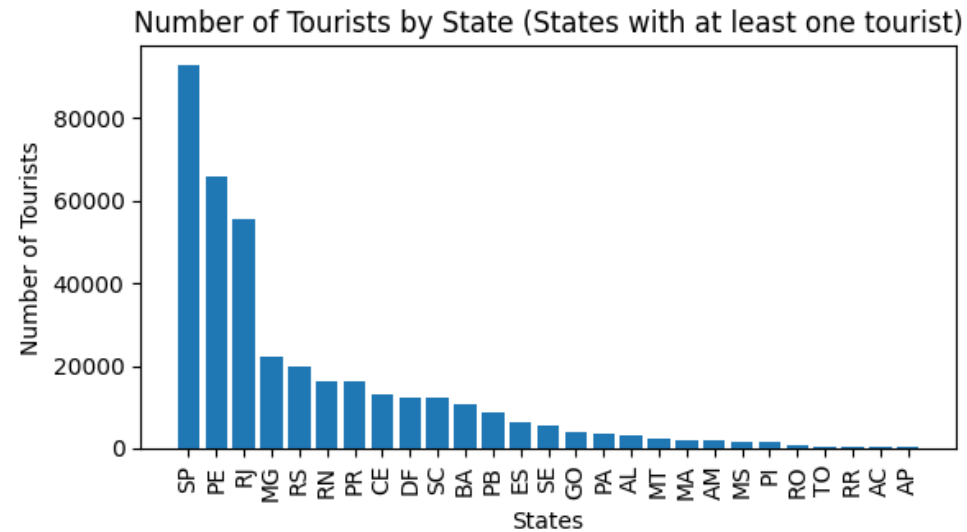
Period

**2010-2016**

## Top 3 Number of tourists (2010 - 2016)

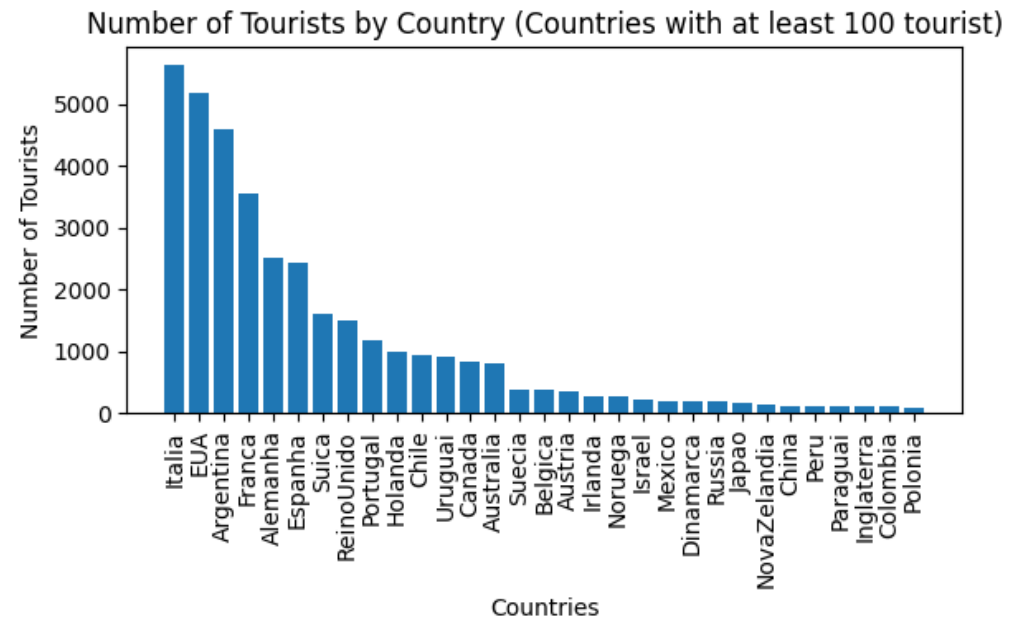
### Brazilian States:

1. São Paulo
2. Pernambuco
3. Rio de Janeiro



### Countries:

1. Italy
2. USA
3. Argentina

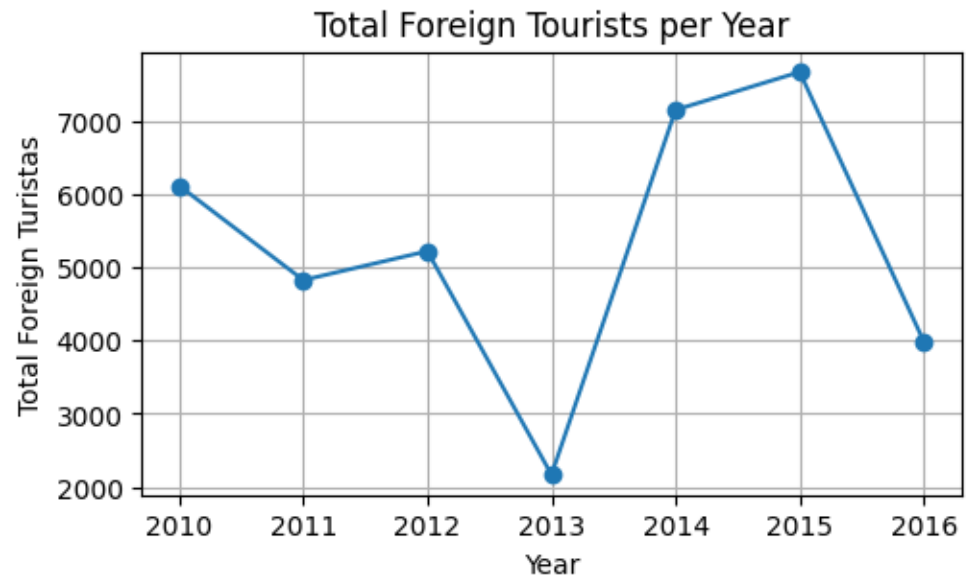
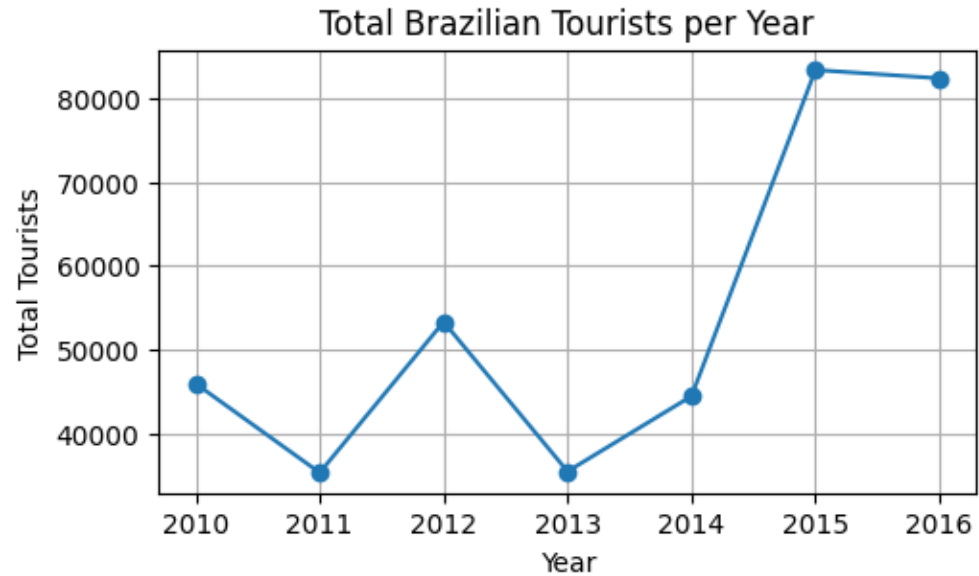




## Total of Brazilian and Foreign Tourist (2010 - 2016)

+ 80,0000  
Brazilian Tourists in 2015

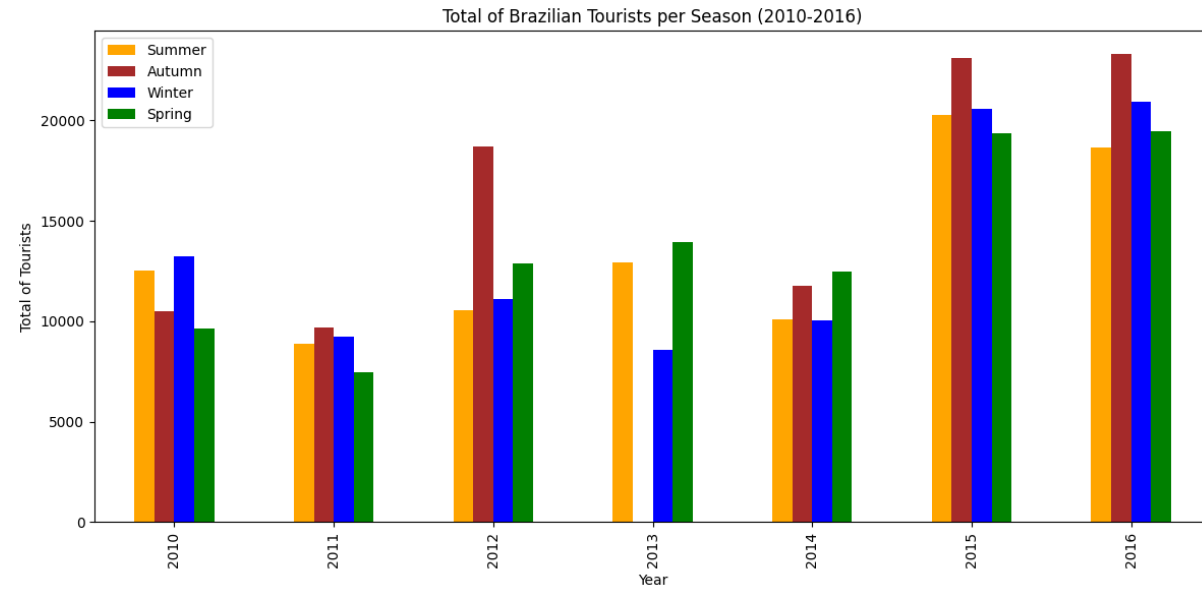
+7,000  
Foreign Tourists in 2015



## Total of Brazilian and Foreign Tourist (2010 - 2016)

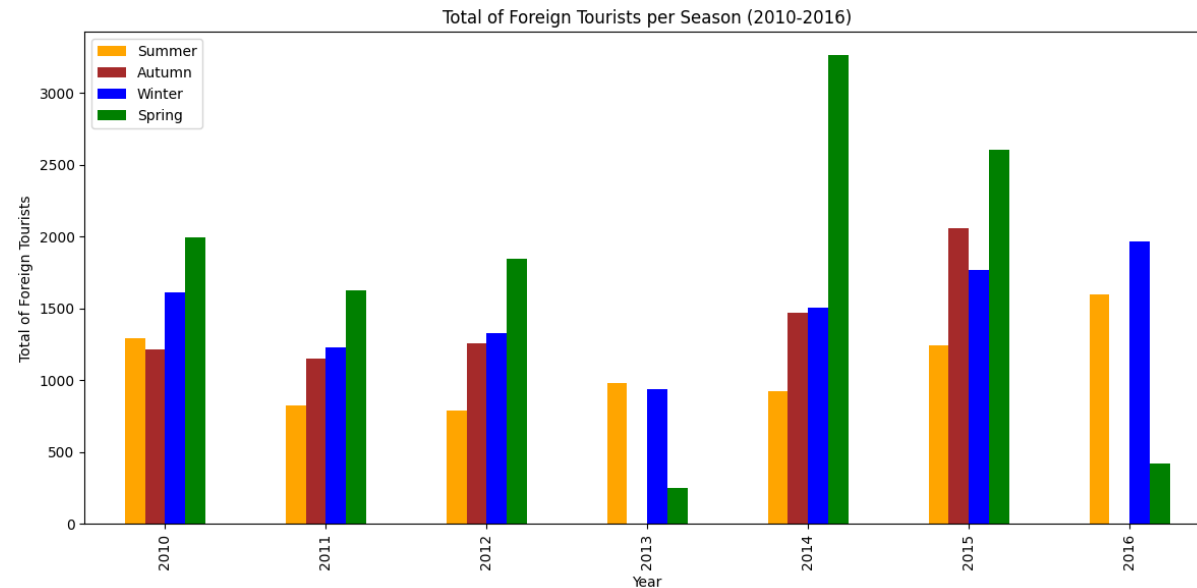
AUTUMN

the season that receives the most Brazilian tourists



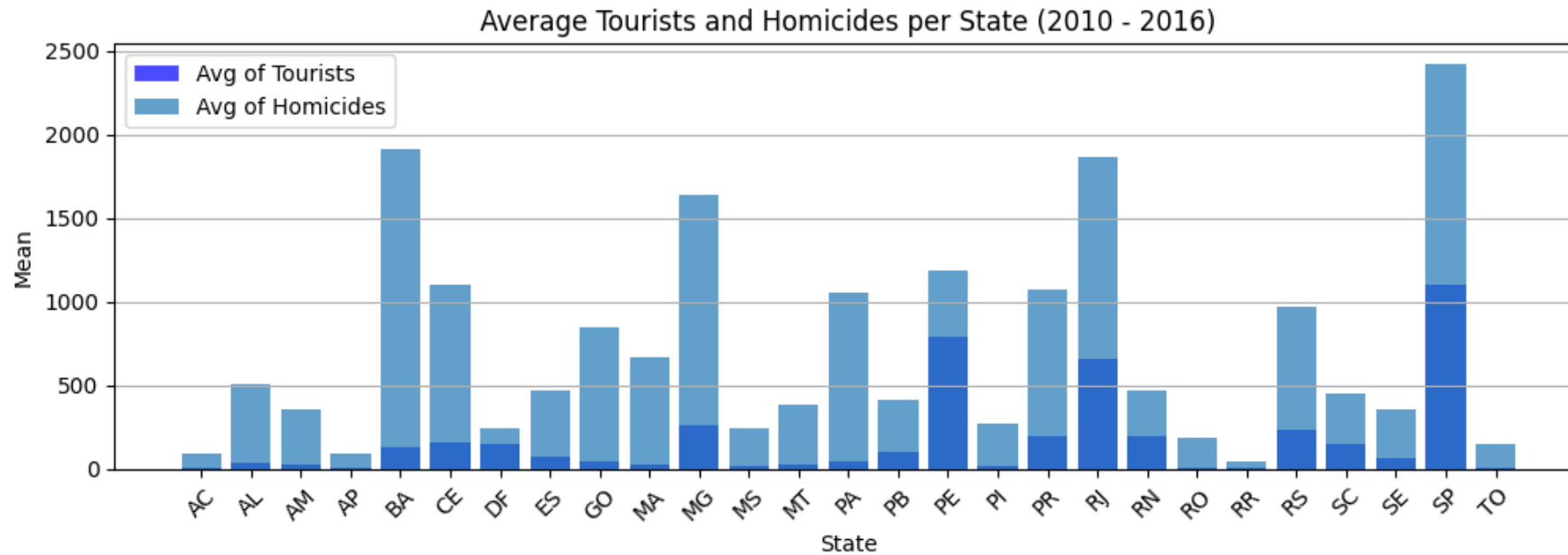
SPRING

the season that receives the most foreign tourists



## ► São Paulo is

- the state where the most homicides occur, and it is also the state that sends the most tourists to the island, on **average**



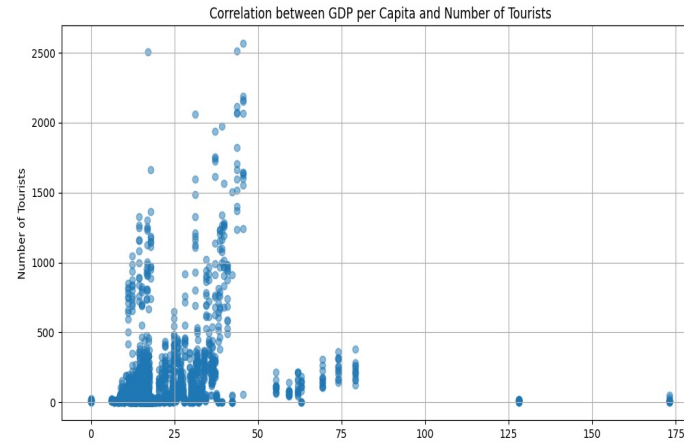
- This could be an indication that tourists from São Paulo consider Fernando de Noronha a safe place in terms of the number of homicides compared to their hometown."



## Correlations

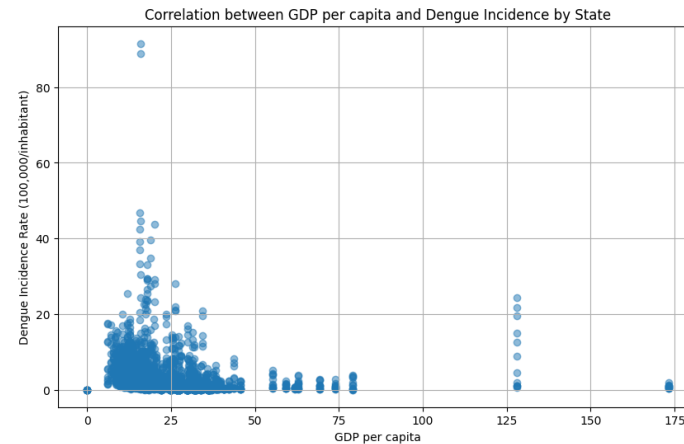
0.1652

Correlation between GDP per Capita and  
number of tourists



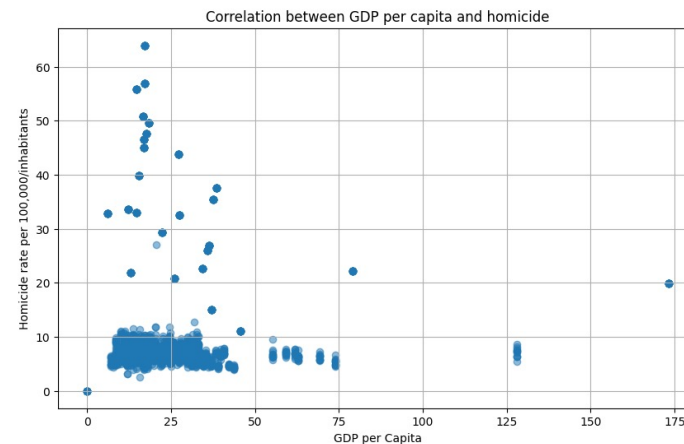
-0.1267

Correlation between GDP per Capita and  
dengue incidence rate



0.0217

Correlation between GDP per Capita and  
homicide rate



For these three variables,  
there is a statistically  
positive correlation;  
however, it is weak.

# Linear Regression

The smaller number of observations since only Brazilian states are included in the regression

OLS Regression Results						
Dep. Variable:	tur	R-squared:	0.505			
Model:	OLS	Adj. R-squared:	0.504			
Method:	Least Squares	F-statistic:	577.6			
Date:	Mon, 16 Oct 2023	Prob (F-statistic):	0.00			
Time:	10:42:30	Log-Likelihood:	-15487.			
No. Observations:	2268	AIC:	3.098e+04			
Df Residuals:	2263	BIC:	3.101e+04			
Df Model:	4					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
Intercept	35.0161	8.654	4.046	0.000	18.045	51.987
hom	0.0547	0.005	10.303	0.000	0.044	0.065
dengue	-0.0341	0.016	-2.170	0.030	-0.065	-0.003
PIB	6.008e-07	1.74e-08	34.434	0.000	5.67e-07	6.35e-07
pibcap	-0.7294	0.275	-2.652	0.008	-1.269	-0.190
Omnibus:	1023.756	Durbin-Watson:	0.626			
Prob(Omnibus):	0.000	Jarque-Bera (JB):	28903.150			
Skew:	1.534	Prob(JB):	0.00			
Kurtosis:	20.217	Cond. No.	7.06e+08			

Residues do not follow a normal distribution

# Conclusion

## Brazilian Tourists

- ▶ There is a weak correlation between GDP per Capita and variables such as the incidence rate of dengue and homicide rate.
- ▶ An increase in homicides in Brazilian states could lead to a higher number of tourists visiting the island, similar to the rise in the dengue incidence rate.

## Foreign Tourists

- ▶ Most foreign tourists come from Italy.
- ▶ Spring is the most visited season by foreign tourists.

# Thank you!



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