

Crop Study: Rice, Wheat, Maize



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Motivation

How temperature, rainfall, elevation at a particular place can determine crop cultivation at that place



Packages used

- Pandas
- Numpy
- Matplotlib



Dataset Creation

Data of rice producing states

	A	B	C	D	E
1	States	Min avg temp (deg Cel)	Max avg temp (deg Cel)	Avg rainfall (cm)	Elevation (m)
2	West Bengal	21	32	211	500
3	Uttar Pradesh	19	32	134	300
4	Andhra Pradesh	23	33	103	269
5	Punjab	17	30	65	300
6	Odisha	22	35	149	500
7	Chattisgarh	29	34	116	275
8	Tamil Nadu	22	34	100	189
9	Bihar	20	31	125	53
10	Assam	19	30	281	80
11	Haryana	21	33	62	200

- Source: 1. <https://en.wikipedia.org/wiki/>
2. <http://www.rainwaterharvesting.org/Urban/Rainfall.htm>
3. <https://weatherandclimate.com/>
4. <https://blog.bijak.in/>

Class creation

```
In [27]: #Class rice
class class_rice:
    def __init__(self):
        pass

    # Functions
    def rice_temp(self):
        print(f"Rice requires temperature of {data_rice['Min avg temp (deg Cel)'].min()}-{data_rice['Max avg temp (deg Cel)'].max()} deg Cel")

    def rice_rain(self):
        print(f"Rice requires rainfall of {data_rice['Avg rainfall (cm)'].min()}-{data_rice['Avg rainfall (cm)'].max()} cm")

    def rice_elev(self):
        print(f"Rice requires elevation of {data_rice['Elevation (m)'].min()}-{data_rice['Elevation (m)'].max()} m")

    def rice_states(self):
        rice_sname = data_rice['States'].astype(str).tolist()
        result1 = ', '.join(rice_sname)
        print(f"Major rice growing states in India are: {result1}")
```

Calling of class functions

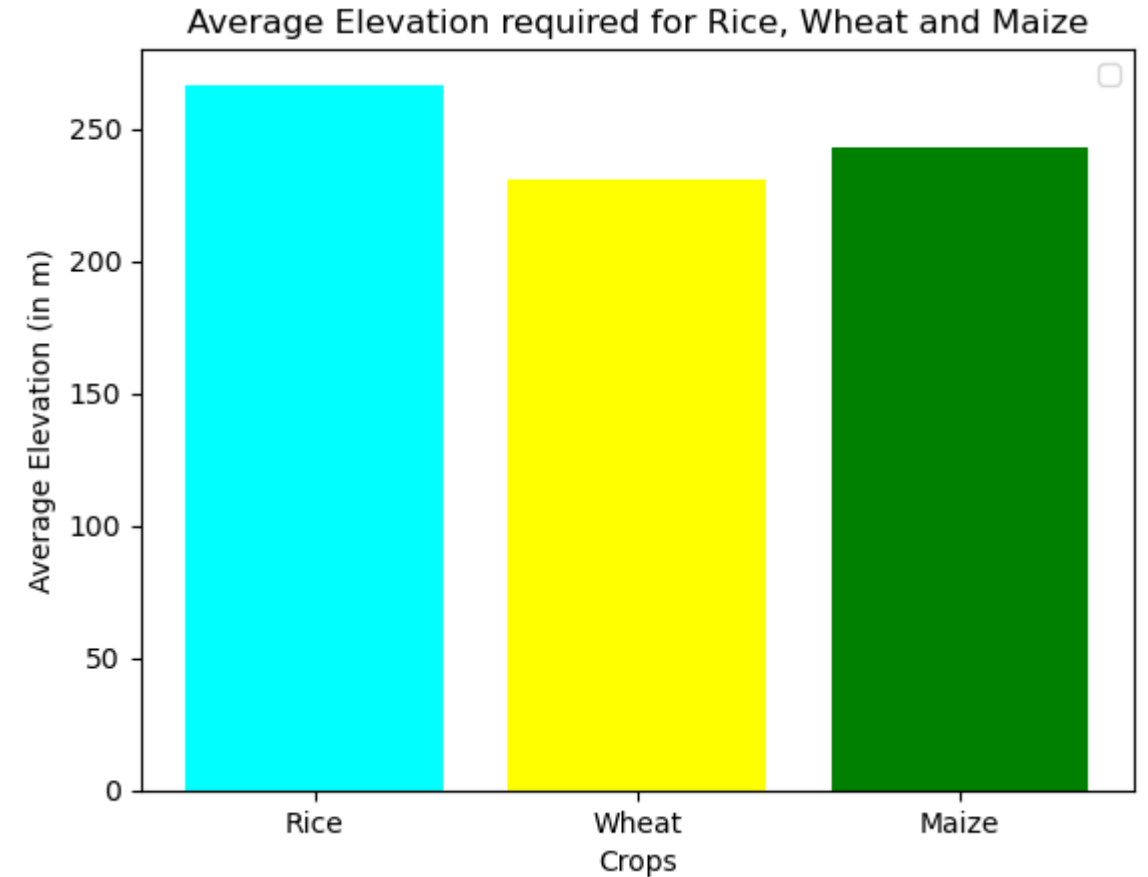
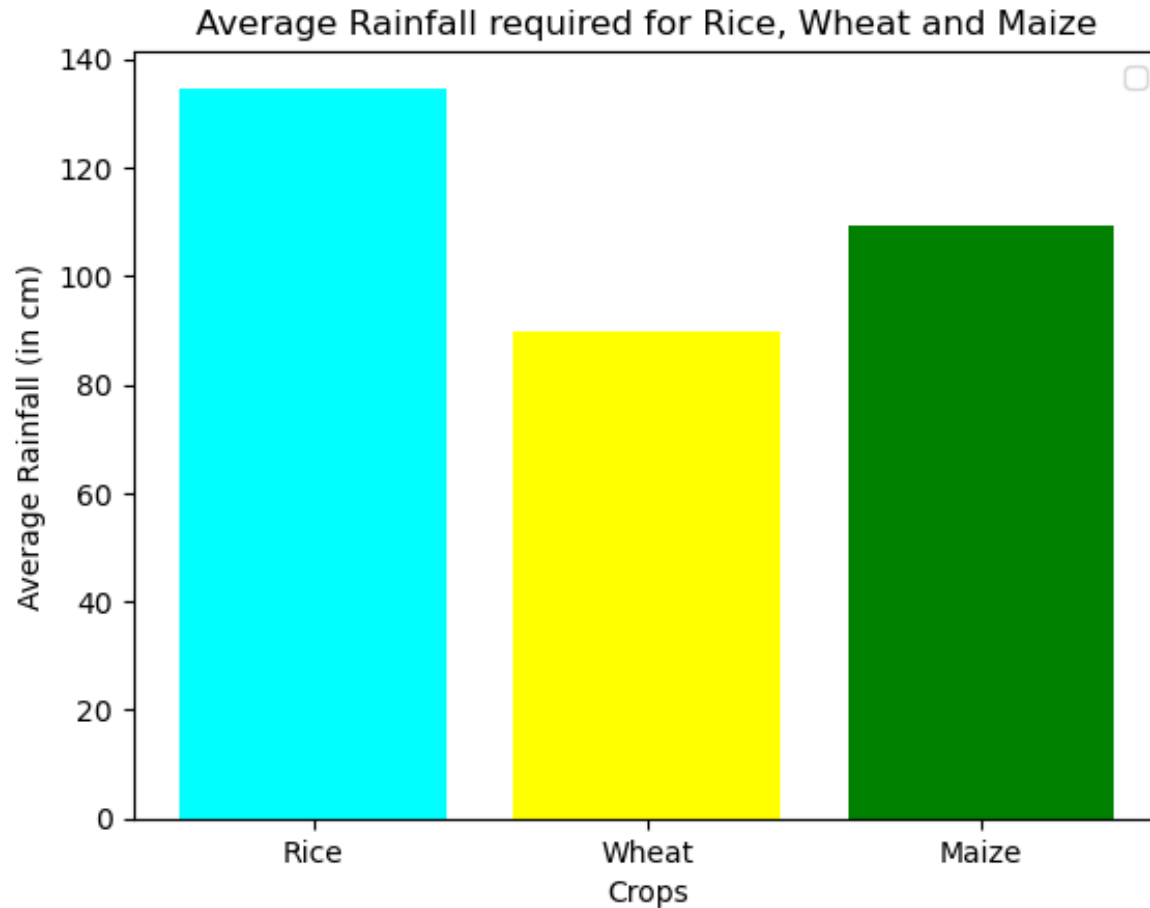
3 classes- class_rice, class_wheat, class_maize

```
[61]: rice = class_rice()  
      wheat = class_wheat()  
      maize = class_maize()
```

```
[64]: rice.rice_states()
```

Major rice growing states in India are: West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Odisha, Chattisgarh, Tamil Nadu, Bihar, Assam, Haryana

Visualization



- Rainfall required by rice is higher as compared to wheat and maize
- All the three crops can grow at a wide range of elevation

Inferences

```
In [ ]: print(rice.rice_temp())  
        print(rice.rice_rain())  
        print(rice.rice_elev())  
        print(rice.rice_states())
```

Rice requires temperature of 17-35 deg Cel

Rice requires rainfall of 62-281 cm

Rice requires elevation of 53-500 cm

Major rice growing states in India are: West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Odisha, Chattisgarh, Tamil Nadu, Bihar, Assam, Haryana None

Future Work

- Study other factors that affect crop cultivation such as pollution, forest cover, availability of water resources and so on.
- Study other commercially important crops.
- Create a model that can determine the best crop that can be grown at a particular place based on its latitude and longitude

THANK YOU