Bernoulli random variable

Definition:

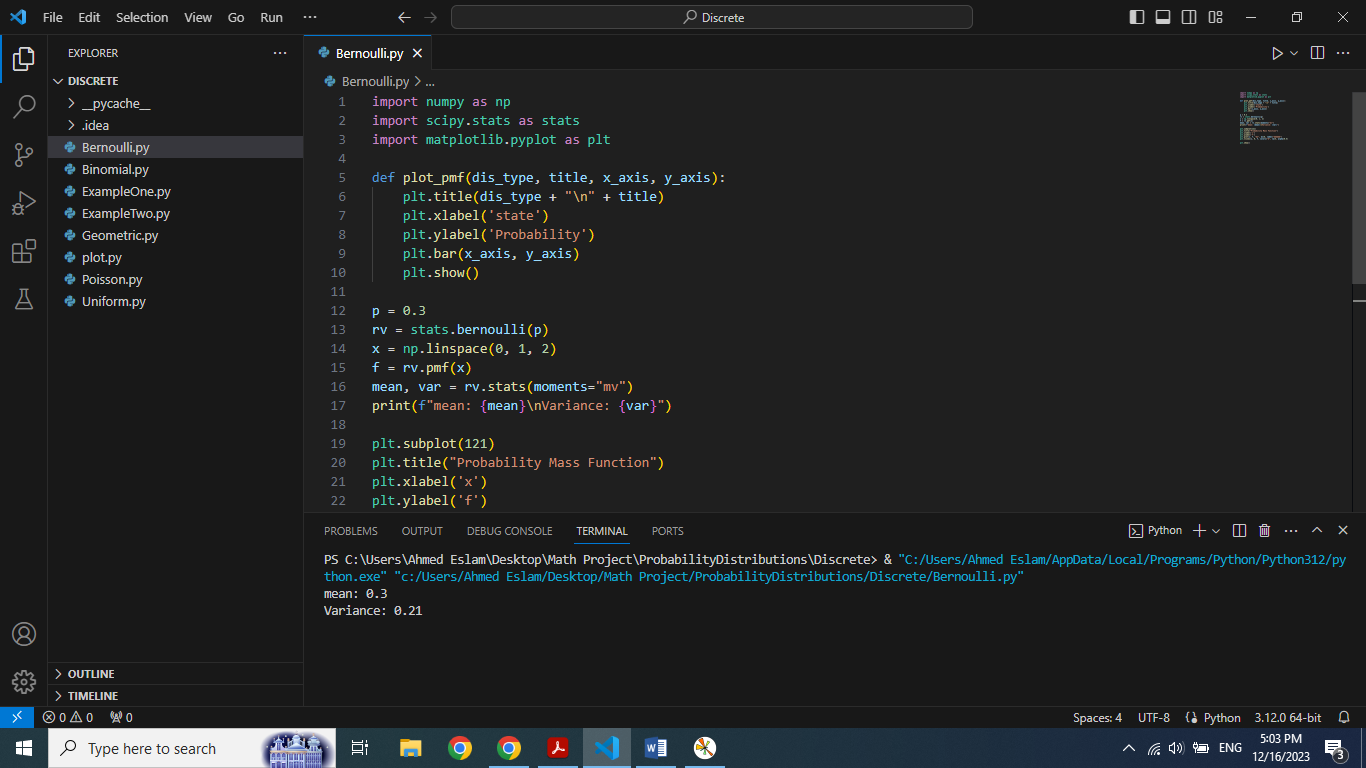
A Bernoulli random variable is a discrete random variable that takes on only two possible values, typically represented as "success" or "failure," or 1 or 0. It is a simple type of random variable that is used to model situations where there are only two possible outcomes.

Px(0) = 1 – P Px(1) = P

Properties of Bernoulli random variable

* Expectaion: E [x] = P
* Second moment: E [x2] = P
* Variance: Var [x] = P(1-P)

**First, we need to import needed libraries and define the plotting function:**

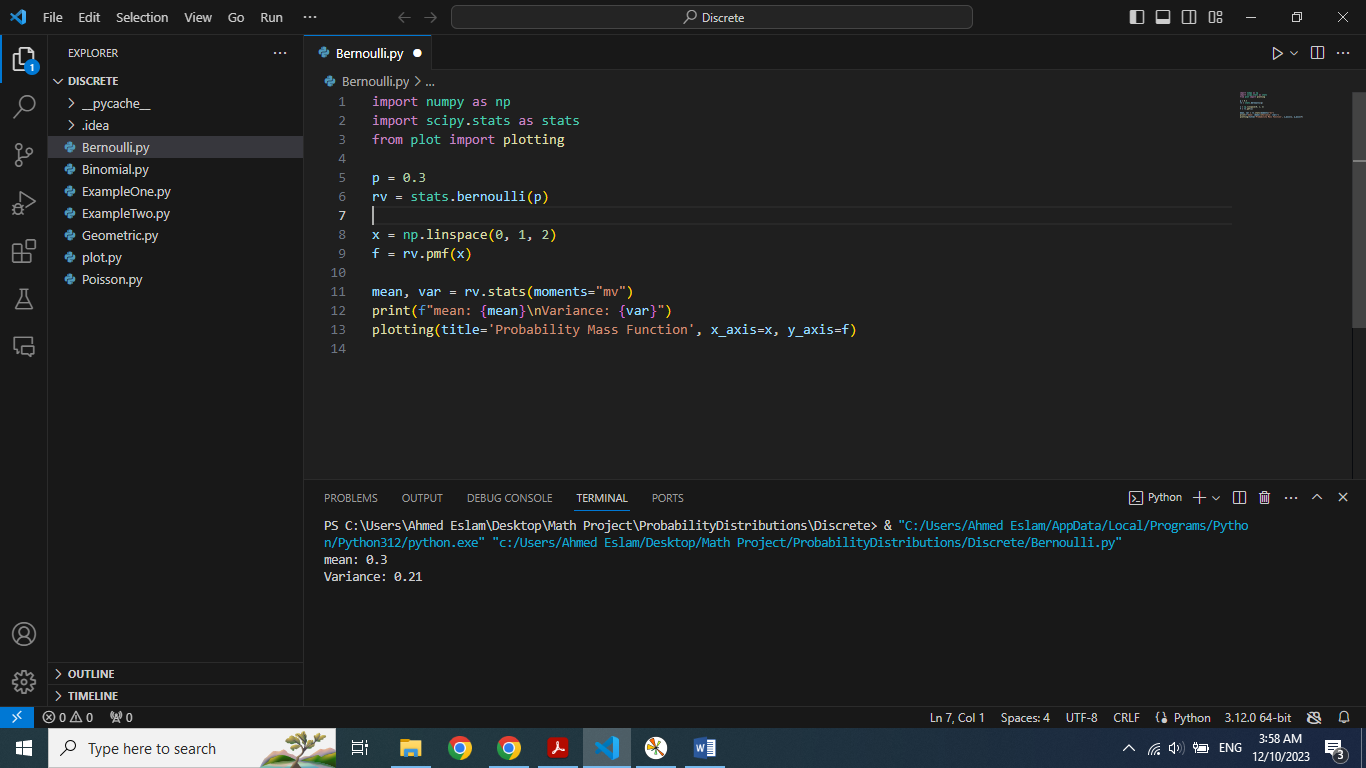


**"numpy"** as **np** for numerical operations, **"scipy,stats"** as **stats** for statistical functions, **"matplotlib.pyplot"** as **plt** for graphing the functions.

For defining plotting function named **"plot\_pmf"** and determining it's parameters from "dis\_type", "title", "x\_axis", "y\_axis"

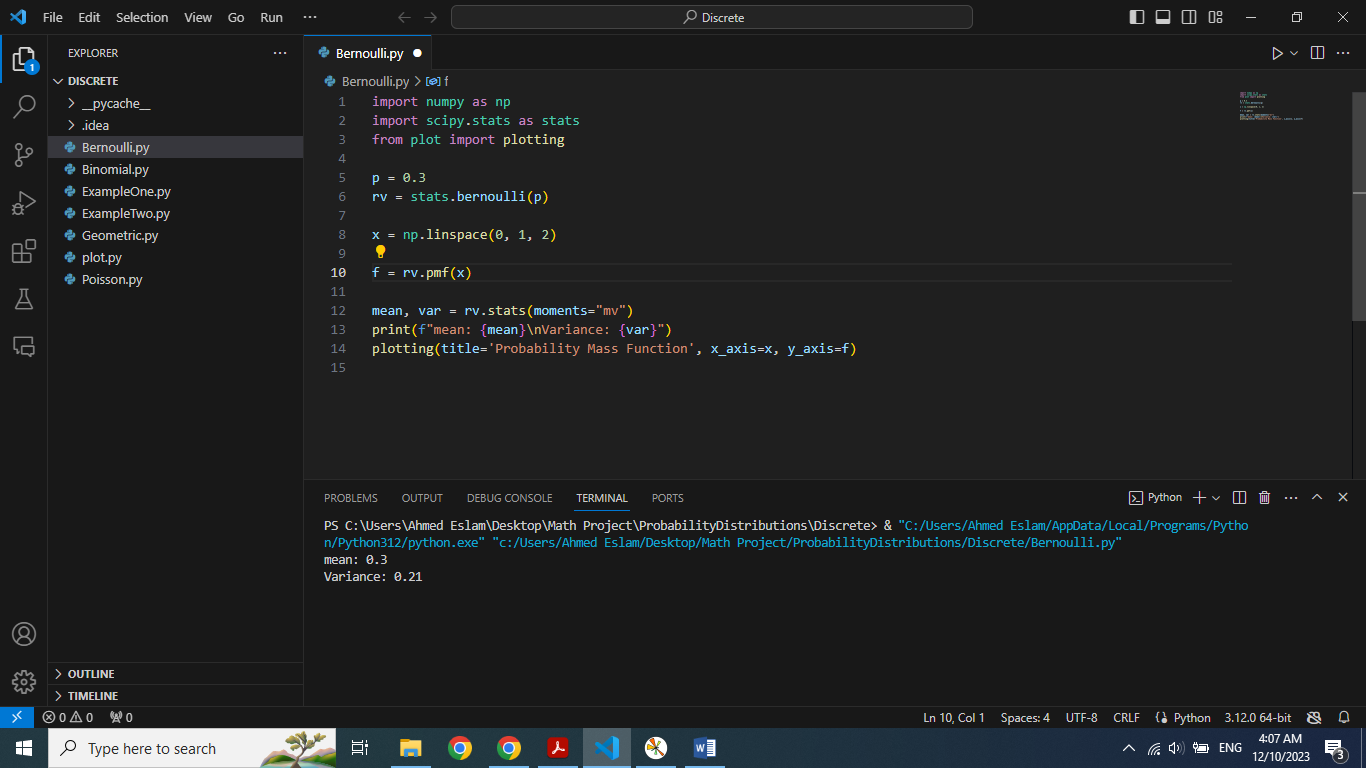
And creating bar plot using **"plt.bar"** and showing it using **"plt.show"**

**Second, setting up the Bernoulli distribution:**



Where **'P'** is the probability of success of the Bernoulli distrbution

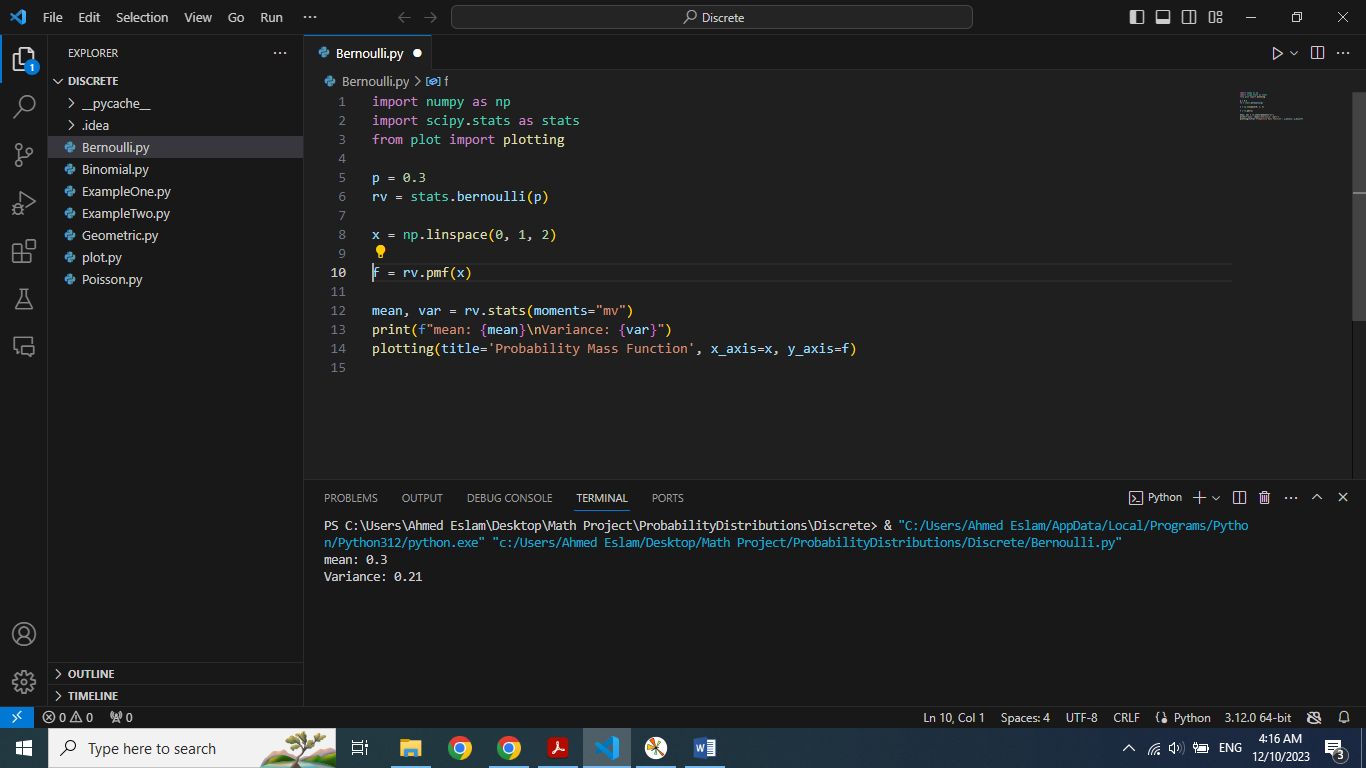
In addition, **'stats.bernoulli (p)'** creates a Bernoulli random variable distribution with specified probability **'P'**.

**Third, Defining values for X (Possible outcomes)**:

**'np.linespace (0, 1, 2)'** generates an array of two values between 0 and 1

In this case, **X** will be an array of [0 , 1].

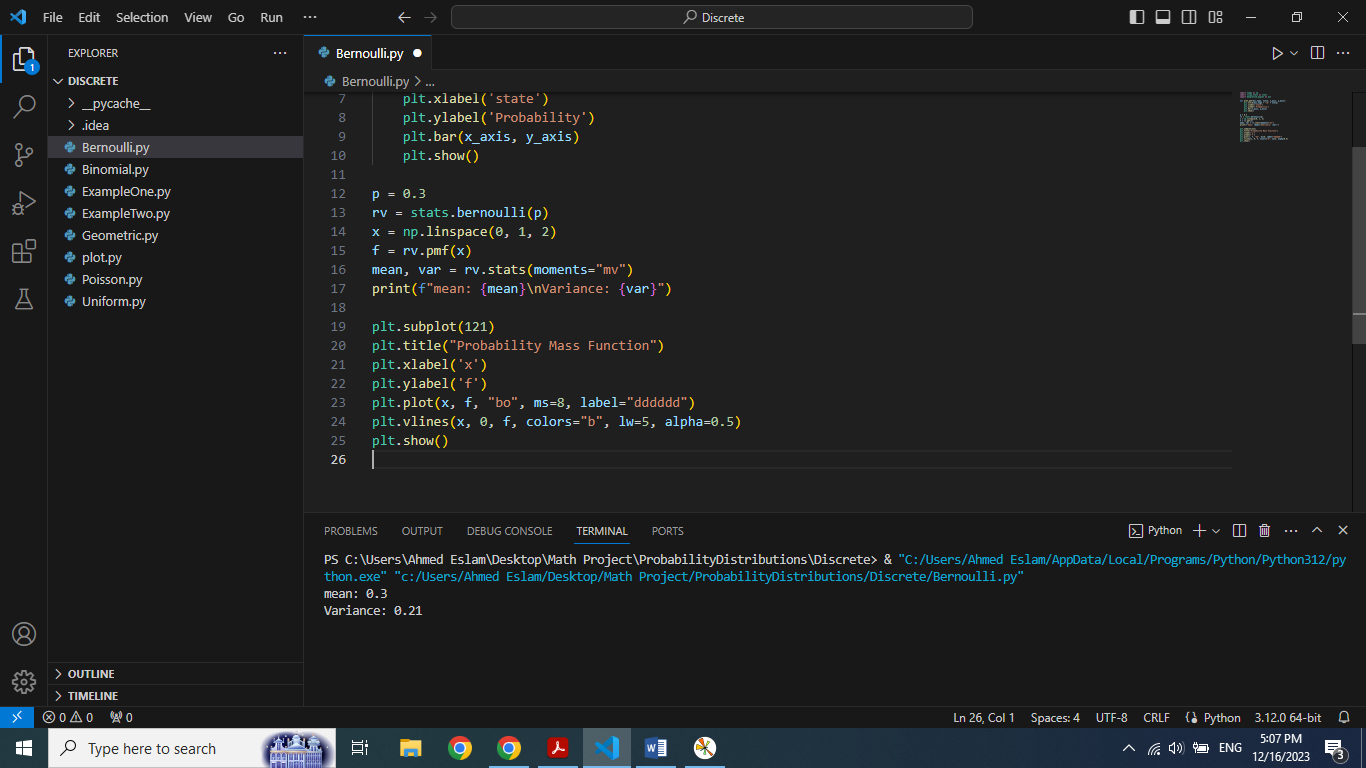
**Fourth, calculating probability mass function (PFM), Mean and Variance:**



Here **'rv.pmf(x)'** calculates the probability mass function for the specified outcomes in **'X'**

Function **'rv.stats (moments="mv")'**calculates mean and var of Bernoulli

**Finally, printing mean and variance also, plotting the PMF:**



**Output:**

