CO3 –lab questions

Practical 9

Questions related to Marginal and joint probability.  
  
**Pre-Lab**1. What is probability?  
2. What is Marginal probability  
3. What is joint probability  
4. What is conditional probability

**In-Lab**

Consider the following table containing the weather condition of two cities Vijayawada and Hyderabad for twenty days.

|  |  |  |
| --- | --- | --- |
| day | Vijayawada | Hyderabad |
| 1 | Sunny | Sunny |
| 2 | Cloudy | Cloudy |
| 3 | Sunny | Cloudy |
| 4 | Cloudy | Cloudy |
| 5 | Sunny | Sunny |
| 6 | Cloudy | Cloudy |
| 7 | Rainy | Rainy |
| 8 | Sunny | Sunny |
| 9 | Rainy | Rainy |
| 10 | Sunny | Cloudy |
| 11 | Cloudy | Cloudy |
| 12 | Rainy | Rainy |
| 13 | Sunny | Sunny |
| 14 | Rainy | Cloudy |
| 15 | Cloudy | Rainy |
| 16 | Sunny | Sunny |
| 17 | Cloudy | Sunny |
| 18 | Cloudy | Cloudy |
| 19 | Cloudy | Rainy |
| 20 | Sunny | Sunny |

1. Calculate the joint probability p(Vijayawada=sunny, Hyderabad=sunny), it can be noted as p(sunny, sunny).
2. Calculate the joint probability p(Vijayawada=cloudy, Hyderabad=sunny), it can be noted as p(cloudy, rainy).
3. Calculate the joint probability p(Vijayawada=rainy, Hyderabad=sunny), it can be noted as p(rainy, rainy).
4. Calculate the joint probability p( Vijayawada=rainy, Hyderabad=rainy), it can be noted as p(sunny, sunny).
5. Calculate the joint probability p(Vijayawada=cloudy, Hyderabad=cloudy), it can be noted as p(cloudy, rainy).

**Post-Lab**

1. Calculate the joint probability p(Vijayawada=sunny, Hyderabad=cloudy), it can be noted as p(sunny, cloudy).
2. Calculate the joint probability p( Vijayawada=cloudy, Hyderabad=rainy), it can be noted as p(cloudy, rainy).
3. Calculate the joint probability p(Vijayawada=rainy, Hyderabad=cloudy), it can be noted as p( rainy, cloudy).

Need to compute this table form the above data and solve the above questions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Sunny | Cloud | Rainy | Marginal |
| Sunny | 6/20 | 2/20 | 0/20 | 8/20 |
| Cloudy | 1/20 | 5/20 | 2/20 | 8/20 |
| Rainy | 0/20 | 1/20 | 3/20 | 4/20 |
| Marginal | 7/20 | 8/20 | 5/20 | 20/20 |

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Compare joint probability with conditional probability by correlation and covariance.