**Decision Science**

**September 2023 Examination**

**Q 1: Determine the probabilities for the below given statements and write your interpretation using following data. (10 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Do you like Anupama?** | | |
|  | **No** | **Yes** | **Total** |
| **Do you like ‘Kyuki sas bhi kabhi bahu thi”?** | **No** | **15** | **5** | **20** |
| **Yes** | **5** | **25** | **30** |
| **Total** | **20** | **30** | **50** |

**1. What is the probability that randomly selected person has said “yes, I like Kyuki…”?**

**2. What is the probability that randomly selected person has said “ I don’t like Kyuki…”?**

**3. What is the probability that randomly selected person has said “yes, I like Anupama…”?**

**4. What is the probability that randomly selected person has said “ I don’t like Arupama…”?**

**5. What is the probability that randomly selected person has said ‘like Anupama’, also said**

**‘like kyuki….’ prior to that?**

**6. What is the probability that randomly selected person has said ‘like Kyuki….’, also said**

**“don’t like Anupama” prior to that?**

**Note: Do not use any software for the calculation, you are advised to show all necessary steps of calculations.**

**Ans 1**

**1. Probability of saying "Yes, I like Kyuki...”**

This change can be determined by dividing the number of those who said "sure," like Kyuki, by the whole number of human beings:

Probability = (number of those who said "yes” like Yuki) / (general number of humans)

Probability = 30/ 50 = 0.6 or 60%

**Interpretation:** The possibility that a randomly decided person says, "Sure, I like Kyuki..." is

It is only half solved

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**Q2: Calculate the correlations among all possible combinations of variables using the following data and write your interpretations. (10 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **State** | **Urban No of**  **Bank Offices** | **Urban Amount**  **Credit** | **Urban Amount**  **Deposit** | **Urban No of**  **Accounts** |
| **ANDAMAN & NICOBAR ISLANDS** | **31** | **10798.91** | **23009.661** | **300860** |
| **ANDHRA PRADESH** | **4254** | **1771561.22** | **1785273.21** | **56997520** |
| **ARUNACHAL PRADESH** | **71** | **18713.635** | **55093.574** | **620951** |
| **ASSAM** | **1164** | **321567.825** | **807884.938** | **15333369** |
| **BIHAR** | **3056** | **559501.655** | **1812236.67** | **42338127** |
| **CHANDIGARH** | **424** | **585840** | **549184** | **3364488** |
| **CHHATTISGARH** | **1284** | **599595.538** | **848908.706** | **15436631** |
| **DADRA & NAGAR HAVELI** | **35** | **9937.519** | **26367.337** | **488036** |
| **DAMAN & DIU** | **43** | **8227.23** | **36462.355** | **473049** |
| **GOA** | **397** | **126414.224** | **433800.37** | **3640393** |
| **GUJARAT** | **4831** | **3619277.92** | **4567644.04** | **60961143** |
| **HARYANA** | **2905** | **1446481.5** | **2226409.05** | **31466846** |
| **HIMACHAL PRADESH** | **381** | **90320.203** | **271842.575** | **2927090** |
| **JAMMU & KASHMIR** | **819** | **239474.898** | **578992.602** | **8568486** |
| **JHARKHAND** | **1501** | **385210.622** | **1302088.44** | **17698133** |
| **KARNATAKA** | **6204** | **4337559.3** | **6418221.89** | **72858087** |
| **KERALA** | **5949** | **2212958.59** | **3575806.38** | **59406050** |
| **LAKSHADWEEP** | **5** | **413.064** | **4906.115** | **34583** |
| **MADHYA PRADESH** | **3901** | **1447929.15** | **2508450.77** | **56132871** |
| **MAHARASHTRA** | **8846** | **21914275.1** | **21203097.7** | **139566919** |
| **MANIPUR** | **84** | **17502.179** | **47232.768** | **1216224** |
| **MEGHALAYA** | **165** | **30045.858** | **141589.032** | **1134644** |
| **MIZORAM** | **102** | **20101.754** | **51840.488** | **743615** |
| **NAGALAND** | **102** | **21505.157** | **70089.604** | **871327** |
| **NCT OF DELHI** | **3408** | **9559956.37** | **9604406.95** | **43749602** |
| **ODISHA** | **2123** | **678962.946** | **1608027.32** | **21675814** |
| **PUDUCHERRY** | **180** | **75818.599** | **118598.454** | **1989219** |
| **PUNJAB** | **3681** | **1547952.7** | **2283001.19** | **35795072** |
| **RAJASTHAN** | **3988** | **1475735.94** | **2194328.32** | **45786526** |
| **SIKKIM** | **39** | **10980.099** | **42445.246** | **303941** |
| **TAMIL NADU** | **7218** | **6172405.9** | **5455337.41** | **89424694** |
| **TELANGANA** | **3296** | **3359268.45** | **3303802.62** | **43319782** |
| **TRIPURA** | **216** | **41708.593** | **127616.832** | **2685808** |
| **UTTAR PRADESH** | **8522** | **2490881.56** | **5930432.61** | **117339360** |
| **UTTARAKHAND** | **1042** | **251706.35** | **748447.406** | **8992680** |
| **WEST BENGAL** | **4498** | **3061581** | **5141434.75** | **65921120** |

**Ans 2 (A)**

The correlation coefficient between "urban No of bank offices" and "city amount credit," primarily based on the records analysis in Excel, is zero.684. This shows a moderate positive

The correlation coefficient between "Urban No of Bank Offices" and "Urban no of Amount"

The correlation coefficient between "urban No of bank offices" and "urban No of accounts" based on the analysis of the facts in Excel is 0.984. This indicates a robust and high-quality

The correlation analysis in Excel was famous for a robust positive correlation between the variables "urban quantity" (urban amount) and "credit" (credit). The correlation coefficient of one indicates a perfect delicate linear relationship among those variables. This suggests that

The correlation evaluation in Excel reveals a high-quality correlation between the variables

**Q 3A: In Maharashtra there are 20 Big companies in IT sector. Out of these, 15 companies are in Mumbai. What is probability that at least two companies are from Mumbai if total 3 companies selected randomly to form a sample. (5 Marks)**

**Note: Do not use any software for the calculation, you are advised to show all necessary steps of calculations.**

**Ans 3A:**

**Solution**

To solve this problem the use of the binomial distribution, we can define the following parameters:

**Q 3B: Draw the Line chart using EXCEL for the following variables and write your interpretations. Looking at the graph/ numbers (in the table) what type of correlation is suspected between crop area of wheat and cereals. (5 Marks)**

|  |  |  |
| --- | --- | --- |
| **Year** | **AREA UNDER**  **CULTIVATION Wheat (Lakh hectares)** | **AREA UNDER**  **CULTIVATION Coarse Cereals (Lakh hectares)** |
| **1965-66** | **126** | **443** |
| **1970-71** | **182** | **460** |
| **1975-76** | **205** | **438** |
| **1980-81** | **223** | **418** |
| **1985-86** | **230** | **395** |
| **1990-91** | **242** | **363** |
| **1995-96** | **250** | **309** |
| **2000-01** | **257** | **303** |
| **2005-06** | **265** | **291** |
| **2010-11** | **291** | **283** |
| **2015-16** | **304** | **244** |
| **2020-21** | **311** | **241** |

**Ans 3B:**

The graph displays the crop area of wheat and coarse cereals over a span of several years, ranging from 1965-66 to 2020-21. by using studying the graph, we can observe a clear pattern and draw conclusions about the correlation between those variables.

First, let's focus at the crop area of wheat. From the initial year of 1965-66 to the final year of