*Note: All the screenshots for the problems are attached in the appendix*

**1) Come up with your own example of moderation. Explain the variables involved, as well as the expected moderation effect you would hope to find if you had the data to examine the relationship.**

**Answer:**

I will proceed with the example I gave during the class,

***Disasters (Independent variable), GDP of the state (Dependent Variable), Governance (Moderation variable)***

**governance**

**GDP of state**

**Disaster****rs**

*A disaster can* ***negatively effect*** *the Gross Domestic Product of the state. But having a good governance can reduce the effect with preparedness, effective resource allocation and fast response times.*

If a government is good at handling crises like natural disasters or emergencies, it helps the overall financial situation of the state. Understanding this connection can help leaders make plans to improve how the government deals with these situations, making the state more resilient and better at recovering economically when faced with challenges. Just as we have seen in Odisha’s case with Chief minister Naveen Patnaik.

**2) Use the estress dataset posted to examine the following questions. The dataset lists information from a survey of entrepreneurs regarding economic stress and psychological outcomes. Do entrepreneurial self-efficacy (ese), gender and tenure, moderate the relationship between economic stress and depressed affect?**

**Answer:**

**Ese, sex, tenure**

**affect**

**estress****rs**

**Moderation variables :** Ese-> Numerical, sex-> categorical, Tenure-> numerical

**Independent Variable:** Economic stress (estress)

**Dependent Variable:** Depression affect (affect)

As, we can see that tenure(0.0861) and sex (0.86) are not good predictors of depression effect as F-value> alpha(0.05), we can conclude that ese is a good predictor and consider that as our moderation variable.

As ese(0.0006) is good predictor we want to know how much of influence it has on depression effect. + indicates positive relationship, - indicates negative relationship.

**Depression effect = 0.854\* estress + 0.437\* ese -0.1197\*estress\*ese**

For unit increase in estress depression effect increases by 0.854.

For unit increase in ese depression effect increases by 0.437.

For unit increase in estress\*ese together depression effect decreases by 0.119.

So, we can say that there is negative moderation relation between depression affect due to ese and estress.

**3) Explore the personality Subset dataset. Find and discuss the principal components that emerge.**

**Answer:**

According to the eigen values and scree plot there are four factors for this dataset as there are four values greater than 1.

From rotated factor pattern and path diagram, we know that values that are greater than 0.6 are considered. + indicates positive relationship, - indicates negative relationship.

Responsible (Factor 1) =does a thorough job + helpful -careless

Extrovert (Factor 2) =talkative – reserved

Calm (Factor 3)= relaxed – depressed

Critical (Factor 4)= finds fault +curious

These are the four principal components that emerge.

**Question 4) The following table contains information on where the privacy disclaimer islocated on a web site, for three nationalities. Conduct the appropriate test to infer if nationality of website and location of privacy disclaimer are independent.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Location* | *France* | *UK* | *USA* | Row Total |
| Home page | 56 | 68 | 35 | 159 |
| Order page | 19 | 19 | 28 | 66 |
| Client page | 6 | 10 | 16 | 32 |
| Other page | 12 | 9 | 13 | 34 |
| Col Total | 93 | 106 | 92 | 291 |
| **Answer:** |  |  |  |  |

Chi- square test of independence can be conducted to know whether there is relationship between the variables.

**H0:** nationality of website and location of privacy disclaimer are independent.

**H1:** nationality of website and location of privacy disclaimer are dependent.

**As p-value(0.0074) < alpha(0.05), we reject the null and conclude that nationality of website and location of privacy disclaimer are dependent.**

**Question 5) Open the HEART file available in the SAS library. Run the appropriate model to predict if the person is dead or alive, based on some of the other variables in the dataset.**

**Answer:**

As the dependent variable is binary categorical and independent variable is numerical or categorical we can say that we need to binary logistic regression.

As chi-square is less than alpha (0.05) we can say that our model fits the data well.

All variables have chi-square values < alpha, so we can say all the variables are good predictors of whether a person is alive or dead. All variables are significant.

From Analysis of maximum likelihood table:

**Compared to optimal BP-Status level, all other variables have negative relationship:**

* for unit increase in Normal Bp-Status level log odd of being alive decreases by 0.4312 .
* for unit increase in high Bp-Status level log odd of being alive decreases by 1.2978 .

For unit increase in cholesterol level log odd of being alive decreases by 0.0056.

**As heavy smokers are zero group, compared to the heavy smokers:**

* for unit increase in heavy smoking\_status level log odd of being alive decreases by 0.234.
* for unit increase in moderate smoking\_status level log odd of being alive decreases by 0.409.
* for unit increase in light smoking\_status level log odd of being alive decreases by 0.65.
* for unit increase in non-smoker smoking\_status level log odd of being alive decreases by 0.667.

C-value =0.673, indicates the model accuracy. 67.3% values of y are determined by x accurately.

**Appendix:**

2)

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

3)

A screenshot of a computer

Description automatically generated

A screenshot of a data sheet

Description automatically generated

A screenshot of a computer

Description automatically generated A screenshot of a computer

Description automatically generated

4)

A screenshot of a spreadsheet

Description automatically generated

5)

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