*Session8: Assignment 2*

1. Introduction

This assignment will help you to consolidate the concepts learnt in the session.

1. Problem Statement

I decided to treat this as a classification problem by creating a new binary variable affair

(did the woman have at least one affair?) and trying to predict the classification for each

woman.

**Dataset**

The dataset I chose is the affairs dataset that comes with Statsmodels. It was derived

from a survey of women in 1974 by Redbook magazine, in which married women were

asked about their participation in extramarital affairs. More information about the study

is available in a 1978 paper from the Journal of Political Economy.

Description of Variables

The dataset contains 6366 observations of 9 variables:

1. rate\_marriage: woman's rating of her marriage (1 = very poor, 5 = very good)
2. age: woman's age
3. yrs\_married: number of years married
4. children: number of children
5. religious: woman's rating of how religious she is (1 = not religious, 4 = strongly religious)
6. educ: level of education (9 = grade school, 12 = high school, 14 = some college, 16 =

college graduate, 17 = some graduate school, 20 = advanced degree)

1. occupation: woman's occupation (1 = student, 2 = farming/semi-skilled/unskilled, 3 =

"white collar", 4 = teacher/nurse/writer/technician/skilled, 5 = managerial/business, 6 =

professional with advanced degree)

1. occupation\_husb: husband's occupation (same coding as above)
2. affairs: time spent in extra-marital affairs

Code to loading data and modules

import numpy as np

import pandas as pd

import statsmodels.api as sm

import matplotlib.pyplot as plt

from patsy import dmatrices

from sklearn.linear\_model import LogisticRegression

from sklearn.cross\_validation import train\_test\_split

from sklearn import metrics

from sklearn.cross\_validation import cross\_val\_score

dta = sm.datasets.fair.load\_pandas().data

# add "affair" column: 1 represents having affairs, 0 represents not

dta['affair'] = (dta.affairs > 0).astype(int)

y, X = dmatrices('affair ~ rate\_marriage + age + yrs\_married + children + \

religious + educ + C(occupation) + C(occupation\_husb)',

dta, return\_type="dataframe")

X = X.rename(columns = {'C(occupation)[T.2.0]':'occ\_2',

'C(occupation)[T.3.0]':'occ\_3',

'C(occupation)[T.4.0]':'occ\_4',

'C(occupation)[T.5.0]':'occ\_5',

'C(occupation)[T.6.0]':'occ\_6',

'C(occupation\_husb)[T.2.0]':'occ\_husb\_2',

'C(occupation\_husb)[T.3.0]':'occ\_husb\_3',

'C(occupation\_husb)[T.4.0]':'occ\_husb\_4',

'C(occupation\_husb)[T.5.0]':'occ\_husb\_5',

'C(occupation\_husb)[T.6.0]':'occ\_husb\_6'})

y = np.ravel(y)

**Note: The solution shared through Github should contain the source code used**

**and the screenshot of the output.**

***3. Solution:***

**Please fine the solution in the attached HTML file, I am unable to upload it directly to Github link.**

**Kindly enable the word file before clicking on the object so that it opens in a browser.**

****