# AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

## Faculty of Science and Technology

# Assignment Cover Sheet

| | | | | |
|---|---|---|---|---|
| Assignment Title: | Chi Square method test for Mental Health Dataset | | | |
| Assignment No: | 01 | | Date of Submission: | 24 April 2024 |
| Course Title: | Introduction to Data Science | | | |
| Course Code: | CSC4180 | | Section: | B |
| Semester: | Spring | 2023-24 | Course Teacher: | **Tohedul Islam** |

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|---|---|---|---|---|
| 1 | **Avijit Saha Anto** | **21-44630-1** | **BSc [CSE]** | |

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|---|---|---|
| FACULTYCOMMENTS | **Marks Obtained** | |
| | | |
| | **Total Marks** | |

# IMPORTING THE DATASET

**Code:**

```
dataset <- read.csv("E:/Data Science Midterm Project/Mental Health Dataset.csv",na.strings=c((“”)),header= TRUE, sep = ",")

dataset
```

**Output:**

```
> dataset <- read.csv("E:/Data Science Midterm Project/Mental Health Dataset.csv",na.strings=c((“”)),header= TRUE, sep = ",")
> dataset
   Gender        Country Occupation self_employed family_history Growing_Stress Changes_Habits Mental_Health_History Mood_Swings  Coping_Struggles Work_Interest Social_Weakness mental_health_interview care_options treatment
1  Female  United States  Corporate          <NA>             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
2  Female  United States  Corporate          <NA>            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No           No       Yes
3  Female  United States  Corporate          <NA>            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
4  Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                    Maybe          Yes       Yes
5  Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
6  Female         Poland  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                    Maybe     Not sure       Yes
7  Female      Australia  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
8  Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No           No        No
9  Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       No
10 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No           No        No
11 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       No
12 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       No
13 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No           No        No
14 Female         Canada  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
15 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
16 Female United Kingdom  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                    Maybe           No        No
17 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
18 Female   South Africa  Corporate           Yes            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
19 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure        No
20 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No           No       Yes
21 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes        No
22 Female         Canada  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
23 Female United Kingdom  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
24 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No           No       Yes
25 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
26 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
27 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
28 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
29 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       No
30 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
31 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
32 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes        No
33 Female         Sweden  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes        No
34 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No           No       Yes
35 Female         Sweden  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
36 Female  United States  Corporate            No            Yes             Yes             No                  Yes      Medium                No            No              Yes                       No     Not sure       Yes
37 Female  United States  Corporate            No             No             Yes             No                  Yes      Medium                No            No              Yes                       No          Yes       Yes
```

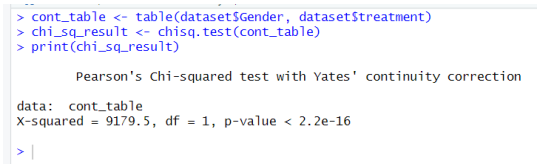
## APPLYING 'CHI SQUARED' METHOD

- **Gender ~ treatment**

**Code:**

```
cont_table <- table(dataset$Gender, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

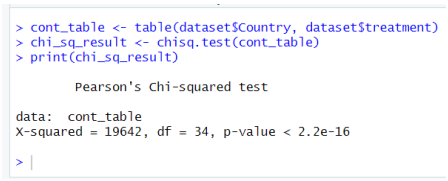



- **Country ~ treatment**

**Code:**

```
cont_table <- table(dataset$Country, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

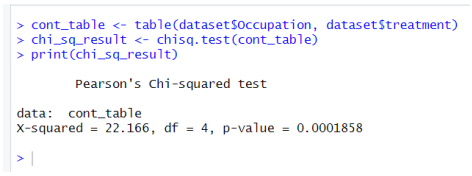


❖ **Occupation ~ treatment**

**Code:**

```
cont_table <- table(dataset$Occupation, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

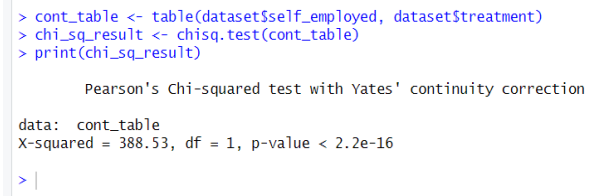



❖ **self_employed ~ treatment**

**Code:**

```
cont_table <- table(dataset$self_employed, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

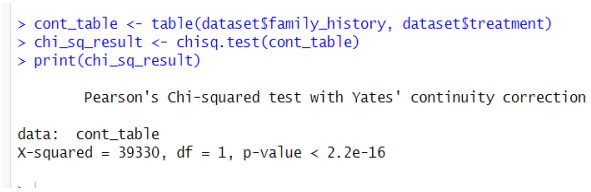


❖ **family_history ~ treatment**

**Code:**

```
cont_table <- table(dataset$family_history, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

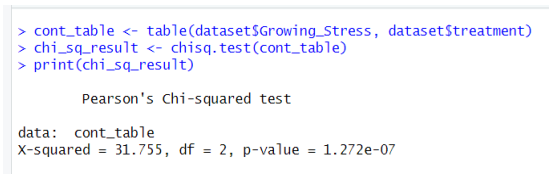



❖ **Growing_Stress ~ treatment**

**Code:**

```
cont_table <- table(dataset$Growing_Stress, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**



### ❖ Changes_Habits ~ treatment

**Code:**

```
cont_table <- table(dataset$Changes_Habits, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$Changes_Habits, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 1.4376, df = 2, p-value = 0.4873
```

### ❖ Mental_Health_History ~ treatment

**Code:**

```
cont_table <- table(dataset$Mental_Health_History, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$Mental_Health_History, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 13.561, df = 2, p-value = 0.001136
```

❖ **Mood_Swings ~ treatment**

**Code:**

```
cont_table <- table(dataset$Mood_Swings, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$Mood_Swings, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 5.2364, df = 2, p-value = 0.07293
```

❖ **Coping_Struggles ~ treatment**

**Code:**

```
cont_table <- table(dataset$Coping_Struggles, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$Coping_Struggles, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test with Yates' continuity correction

data:  cont_table
X-squared = 29.111, df = 1, p-value = 6.834e-08
```

❖ **Work_Interest ~ treatment**

**Code:**

```
cont_table <- table(dataset$Work_Interest, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$Work_Interest, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 4.5128, df = 2, p-value = 0.1047
```

❖ **Social_Weakness ~ treatment**

**Code:**

```
cont_table <- table(dataset$Social_Weakness, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$Social_Weakness, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 1.5815, df = 2, p-value = 0.4535
```

❖ **mental_health_interview ~ treatment**

**Code:**

```
cont_table <- table(dataset$mental_health_interview, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$mental_health_interview, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 2805.8, df = 2, p-value < 2.2e-16
```

❖ **care_options ~ treatment**

**Code:**

```
cont_table <- table(dataset$care_options, dataset$treatment)
chi_sq_result <- chisq.test(cont_table)
print(chi_sq_result)
```

**Output:**

```
> cont_table <- table(dataset$care_options, dataset$treatment)
> chi_sq_result <- chisq.test(cont_table)
> print(chi_sq_result)

        Pearson's Chi-squared test

data:  cont_table
X-squared = 25215, df = 2, p-value < 2.2e-16
```