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|  | **BAHRIA UNIVERSITY,**  **(Karachi Campus)**  *Department of Software Engineering*  **ASSIGNMENT#01 – Fall 2021** |

Course Title: **Probability & Statistics** Course Code: **GSC-112**

Class: **BSE-3(B)** Deadline: **29-Nov-2021**

Course Instructor: **Engr. M. Adnan Ur Rehman** Max. Points: **20 Points**

**Instructions:**

* Consider the dataset named **“Rain in Australia”** contained in **WeatherAUS.xlsx** file present in [LMS shared folder](https://pern-my.sharepoint.com/:f:/g/personal/adnanurrehman_bukc_bahria_edu_pk/Evx7n7gn2-xPnGPzLA1Ct5MBLWPI_cHhkG8XkGPIGFeoRQ?e=wb85Yd).
* Do not consider the record if any required column has no data.
* All question should be answered in the same file using black font color.
* Upload your solution only on LMS. All students of a group must upload the same file.

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| **GROUP MEMBERS INFORMATION** | | |
| **S.No.** | **Student Name** | **Enrollment No :** |
| 1 | Muhammad Junaid Saleem Qadri | 02-131202-057 |
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**Question-1: [05 marks; CLO-2]**

An electric power company, based on renewable energy, needs to install their wind turbines on the windiest location in Australia. You need to find out that location.

**Solution:**STEP 1: Divide the data into different locations.

STEP 2: Take the mean of wind speed at 9am column and ignore the empty cells.

STEP 3: Take the mean of wind speed at 3am column and ignore the empty cells.

STEP 4: Take the mean of the above two values.

STEP 5: Repeat steps 2,3 and 4 for all the locations.

STEP 6: Identify the location with the highest wind speed.

**Result :**The windiest location in Australia according to the given data is **Gold Coast** with the average windspeed of **22.60554 km/h**.

**Question-2: [05 marks; CLO-2]**

It is true that greater the difference between minimum and maximum temperature per day, greater will be the chance of getting seasonal flu. Find out the location where there is minimum chance of getting seasonal flu.

**Solution :**

STEP 1: Separate all Locations into different Excel sheets (Total 49 Locations).

STEP 2: In **min temp** column, calculate the mean of all the values and delete the empty cells.

STEP 3: In **max temp** column, calculate the mean of all the values and delete the empty cells.

STEP 4: Calculate the Temperature difference, Subtract the **min temp** mean from **max temp** mean.

STEP 5: Continue the previous steps 2, 3 and 4 again for all locations.

STEP 6: Identify the location which has the lowest temperature difference.

**Result :**

**Norfolk Island** has the minimum chance of getting seasonal flu with a temperature difference of **4.95837766** degree Celsius.

**Question-3: [05 marks; CLO-2]**

Find out the location having almost same temperature comparatively throughout the given data.

**Solution :**

STEP 1: Separate all Locations into different Excel sheets (Total 49 Locations).

STEP 2: Create a new Column(x) which has the average temperature of **min Temp** and **max Temp** [(min Temp + max Temp) / 2].

STEP 3: Find the sample variance of the new column.

STEP 4: Repeat the steps 2 and 3 for all locations.

STEP 5: Identify the locations which has the lowest variance.

**Result :**

**Darwin** has almost the same temperature comparatively throughout the data having a sample variance of **4.185936** degree Celsius.

**Question-4: [05 marks; CLO-3]**

Apply statistical techniques and compare the result to find the location having unexpected wind speed.

**Solution :**

STEP 1: Separate all Locations into different Excel sheets (Total 49 Locations).

STEP 2: Take the mean of the value in wind at 9am column and wind at 3pm column (and ignore the empty cells) and generate a third column of means.

STEP 3: Find the mean of the third column.

STEP 4: Find the median of the third column.

STEP 5: Subtract the median from mean.

STEP 6: Repeat the steps 2,3,4 and 5 for all locations.

STEP 7: Identify the locations which has the highest difference (most outliers).

**Result :**

**Newcastle** has the most unexpected wind speeds with a difference of **2.439939289** between its median and mean.