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"\n",
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```

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"   <td>7.000000</td>\n",
"   <td>13.000000</td>\n",
"   <td>57.000000</td>\n",

```

```
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"    <td>1010.400000</td>\n",
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"    <td>2.000000</td>\n",
"    <td>12.300000</td>\n",
"    <td>16.60000</td>\n",
"  </tr>\n",
" <tr>\n",
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"   <td>12.000000</td>\n",
"   <td>22.600000</td>\n",
"   <td>0.000000</td>\n",
"   <td>4.800000</td>\n",
"   <td>8.400000</td>\n",
"   <td>39.000000</td>\n",
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"   <td>19.000000</td>\n",
"   <td>70.000000</td>\n",
"   <td>52.000000</td>\n",
"   <td>1017.60000</td>\n",
"   <td>1015.200000</td>\n",
"   <td>5.000000</td>\n",
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"   <td>16.700000</td>\n",
"   <td>21.10000</td>\n",
" </tr>\n",
" <tr>\n",
"   <th>75%</th>\n",
"   <td>16.900000</td>\n",
"   <td>28.200000</td>\n",
```

```
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"    <td>19.000000</td>\n",
"    <td>24.000000</td>\n",
"    <td>83.000000</td>\n",
"    <td>66.000000</td>\n",
"    <td>1022.40000</td>\n",
"    <td>1020.000000</td>\n",
"    <td>7.000000</td>\n",
"    <td>7.000000</td>\n",
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"    <td>26.40000</td>\n",
" </tr>\n",
" <tr>\n",
"   <th>max</th>\n",
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"   <td>9.000000</td>
```

```

"    <td>40.200000</td>\n",
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"  </tr>\n",
" </tbody>\n",
"</table>\n",
"</div>\n",
"  <button class=\"colab-df-convert\" onclick=\"convertToInteractive('df-45df3264-8555-4da0-958f-7140e58820fb')\" \n",
"    title=\"Convert this dataframe to an interactive table.\" \n",
"    style=\"display:none;\">\n",
"  \n",
"  <svg xmlns=\"http://www.w3.org/2000/svg\" height=\"24px\" viewBox=\"0 0 24 24\" \n",
"    width=\"24px\">\n",
"    <path d=\"M0 0h24v24H0V0z\" fill=\"none\"/>\n",
"    <path d=\"M18.56 5.44l.94 2.06.94-2.06-.94-2.06-.94 2.06-.94 2.06.94zm-11 11l8.5 8.5l.94-2.06 2.06-.94 2.06-.94L8.5 2.5l-.94 2.06-2.06.94zm10 10l.94 2.06.94-2.06-.94-2.06-.94 2.06-.94-.94 2.06-.94 2.06-.94 2.06.94z\"/><path d=\"M17.41 7.96l-1.37-1.37c-.4-.4-.92-.59-1.43-.59-.52 0-1.04-.2-1.43-.59L10.3 9.45l-7.72 7.72c-.78.78-.78 2.05 0 2.83L4 21.41c.39.39.95 1.41.59 1.41-.2 1.41-.59 1.41-.59 1.41-7.78-7.78 2.81-2.81c.8-.78.8-2.07 0-2.86z\"M5.41 20L4 18.59l7.72-7.72 1.47 1.35L5.41 20z\"/>\n",
"  </svg>\n",
" </button>\n",
"  \n",
" <style>\n",
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"   flex-wrap:wrap;\n",
"   gap: 12px;\n",
" }\n",
"\n",
" .colab-df-convert {\n",
"   background-color: #E8F0FE;\n",
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```

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" }\n",
"\n",
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0.15);\n",
"   fill: #174EA6;\n",
" }\n",
"\n",
" [theme=dark] .colab-df-convert {\n",
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"   fill: #D2E3FC;\n",
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"   box-shadow: 0px 1px 3px 1px rgba(0, 0, 0, 0.15);\n",
"   filter: drop-shadow(0px 1px 2px rgba(0, 0, 0, 0.3));\n",
"   fill: #FFFFFF;\n",
" }\n",
" </style>\n",
"\n",
" <script>\n",
"   const buttonEl =\n",
```

```

"    document.querySelector('#df-45df3264-8555-4da0-958f-7140e58820fb button.colab-
df-convert');\n",
"    buttonEl.style.display =\n",
"    google.colab.kernel.accessAllowed ? 'block' : 'none';\n",
"\n",
"    async function convertToInteractive(key) {\n",
"        const element = document.querySelector('#df-45df3264-8555-4da0-958f-
7140e58820fb');\n",
"        const dataTable =\n",
"        await google.colab.kernel.invokeFunction('convertToInteractive',\n",
"            [key], {});\n",
"        if (!dataTable) return;\n",
"\n",
"        const docLinkHtml = 'Like what you see? Visit the ' +\n",
"        '<a target=\"_blank\"
href=https://colab.research.google.com/notebooks/data_table.ipynb>data table notebook</a>'\n",
"        + ' to learn more about interactive tables.';\n",
"        element.innerHTML = \";\n",
"        dataTable['output_type'] = 'display_data';\n",
"        await google.colab.output.renderOutput(dataTable, element);\n",
"        const docLink = document.createElement('div');\n",
"        docLink.innerHTML = docLinkHtml;\n",
"        element.appendChild(docLink);\n",
"    }\n",
"    </script>\n",
"    </div>\n",
"    </div>\n",
"    "
]
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"execution_count": 4

```

```

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```



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"Data columns (total 23 columns):\n",
"#   Column      Non-Null Count  Dtype  \n",
"---  -
0   Date          145460 non-null object \n",
1   Location      145460 non-null object \n",
2   MinTemp       143975 non-null float64\n",
3   MaxTemp       144199 non-null float64\n",
4   Rainfall      142199 non-null float64\n",
5   Evaporation   82670 non-null float64\n",
6   Sunshine      75625 non-null float64\n",
7   WindGustDir   135134 non-null object \n",
8   WindGustSpeed 135197 non-null float64\n",
9   WindDir9am    134894 non-null object \n",
10  WindDir3pm    141232 non-null object \n",
11  WindSpeed9am  143693 non-null float64\n",
12  WindSpeed3pm  142398 non-null float64\n",
13  Humidity9am   142806 non-null float64\n",
14  Humidity3pm   140953 non-null float64\n",
15  Pressure9am   130395 non-null float64\n",
16  Pressure3pm   130432 non-null float64\n",
17  Cloud9am      89572 non-null float64\n",
18  Cloud3pm      86102 non-null float64\n",
19  Temp9am       143693 non-null float64\n",
20  Temp3pm       141851 non-null float64\n",
21  RainToday     142199 non-null object \n",
22  RainTomorrow  142193 non-null object \n",
"dtypes: float64(16), object(7)\n",
"memory usage: 25.5+ MB\n"
]
}

```

```

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{
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```

```
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        "Location      0\n",
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        "Evaporation   62790\n",
        "Sunshine      69835\n",
        "WindGustDir   10326\n",
        "WindGustSpeed 10263\n",
        "WindDir9am    10566\n",
        "WindDir3pm    4228\n",
        "WindSpeed9am  1767\n",
        "WindSpeed3pm  3062\n",
        "Humidity9am   2654\n",
        "Humidity3pm   4507\n",
        "Pressure9am   15065\n",
```

```

        "Pressure3pm    15028\n",
        "Cloud9am      55888\n",
        "Cloud3pm       59358\n",
        "Temp9am        1767\n",
        "Temp3pm        3609\n",
        "RainToday      3261\n",
        "RainTomorrow   3267\n",
        "dtype: int64"
    ]
},
"metadata": {},
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}
]
},
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        "msno.matrix(df, color= (0.678, 0.678, 0.250), fontsize=14)"
    ],
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        "outputId": "1edcd13c-30d9-4911-8647-3146bebd02b3"
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```

```
{
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    ]
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  "execution_count": 8
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    "df.WindGustDir.replace(np.nan,\"N/a\",inplace=True)\n",

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```
"df.WindDir9am.replace(np.nan,\"N/a\",inplace=True)\n",  
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        "print(x_train.shape)\n",
        "print(y_train.shape)\n",

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"print(y_test.shape)\n"
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    "121764 2011-08-31    Perth   10.9  22.2   1.4    26.0 \\n",
    "139821 2010-06-11    Darwin   19.3  29.9   0.0    43.0 \\n",
    "1867  2014-04-10    Albury   15.7  17.6  12.4    20.0 \\n",
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        "    x_mean=X.mean()\n",
        "    y_mean=Y.mean()\n",
        "\n",
        "    #Formula: ax+b=y\n",
        "    #Calculating a and b values\n",
        "    a=sum([(xi-x_mean)*(yi-y_mean) for xi,yi in zip(X,Y)])/sum([(xi-x_mean)**2 for xi in X])\n",
        "    b=y_mean-(a*x_mean)\n",
        "\n",
        "    #Getting the Y_pred\n",
        "    Y_pred=lambda x: a*x+b\n",
        "    \n",
        "    #Plotting the Regression Line\n",
        "    plt.scatter(X,Y,color='y');\n",
        "    plt.plot([X.min(),X.max()], [Y_pred(X.min()),Y_pred(X.max())],color='purple')\n",
        "    plt.scatter(x_mean,y_mean,color='blue',marker='s');\n",
        "    \n",
        "    RSS=sum([(yi-Y_pred(xi))**2 for xi,yi in zip(X,Y)])\n",
        "    TSS=sum([(yi-y_mean)**2 for yi in Y])\n",
        "    R2_score=1-(RSS/TSS)\n",

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