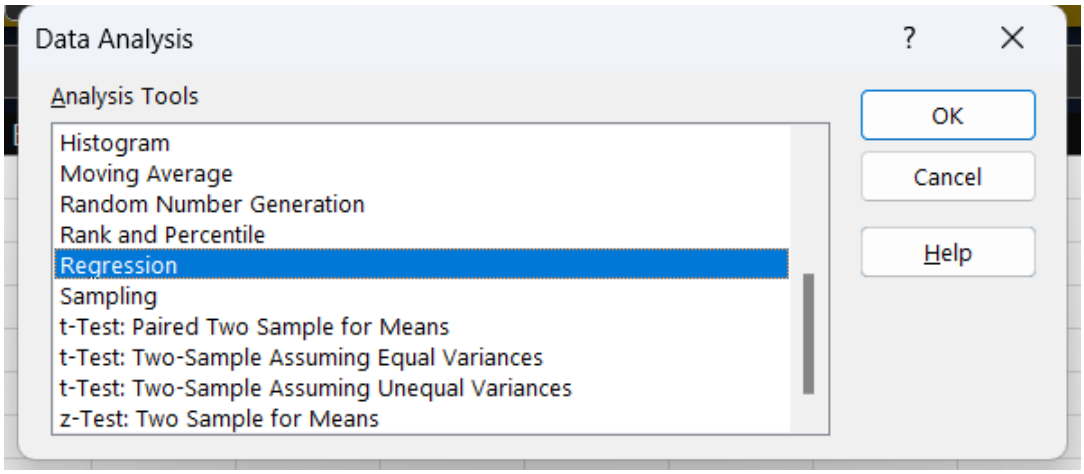
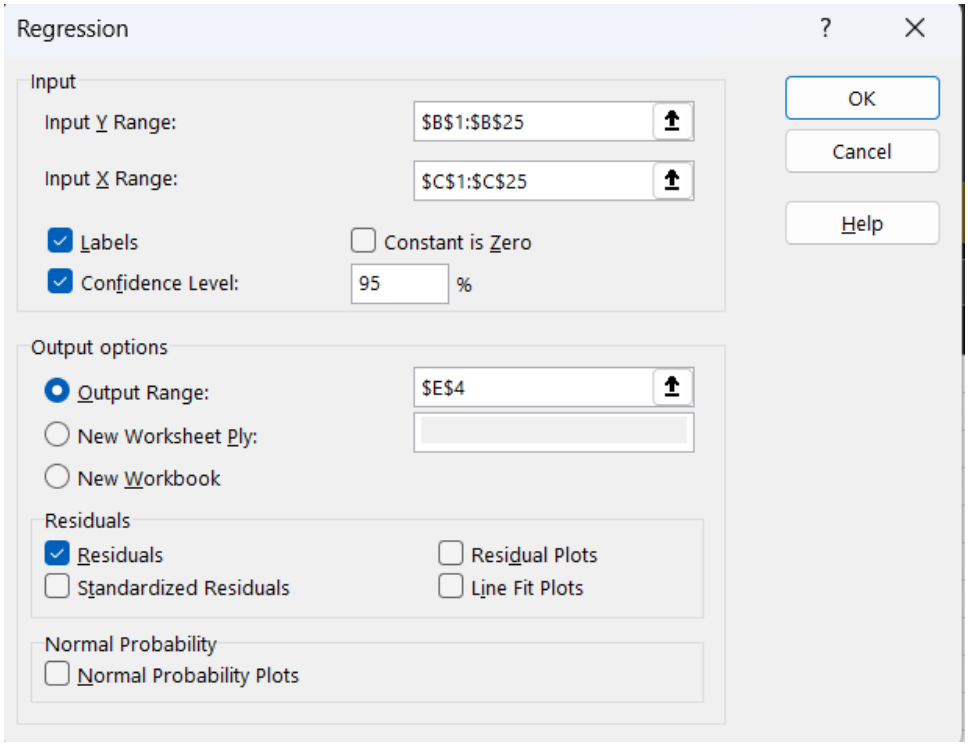
**Practical 10**

**A. Perform linear regression for prediction.**

| MONTH | RAINFALL | UMBRELLAS SOLD |
|---|---|---|
| JAN | 82 | 15 |
| FEB | 92.5 | 25 |
| MAR | 83.2 | 17 |
| APR | 97.7 | 28 |
| MAY | 131.9 | 41 |
| JUN | 141.3 | 47 |
| JUL | 165.4 | 50 |
| AUG | 140 | 46 |
| SEP | 126.7 | 37 |
| OCT | 97.8 | 22 |
| NOV | 86.2 | 20 |
| DEC | 99.6 | 30 |
| JAN | 87 | 14 |
| FEB | 97.5 | 27 |
| MAR | 88.2 | 14 |
| APR | 102.7 | 30 |
| MAY | 123 | 43 |
| JUN | 146.3 | 49 |
| JUL | 160 | 49 |
| AUG | 145 | 44 |
| SEP | 131.7 | 39 |
| OCT | 118 | 36 |
| NOV | 91.2 | 20 |
| DEC | 104.6 | 32 |

Go to Data tab > Data Analysis > Regression > Click Ok.




Select input Y range – A1:A25.

Select input X range – B1:B25.

Check checkboxes for Labels and Confidence Level.

Select output range – E4.

Check checkbox Residuals.

Click Ok.

**Output:**

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.957667 |
| R Square | 0.917126 |
| Adjusted R | 0.913359 |
| Standard E | 7.621758 |
| Observatic | 24 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *ignificance F* |
|---|---|---|---|---|---|
| Regressior | 1 | 14143.01 | 14143.01 | 243.4623 | 2.22E-13 |
| Residual | 22 | 1278.006 | 58.09119 | | |
| Total | 23 | 15421.02 | | | |

| | *Coefficients* | *andard Err* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *ower 95.0%* | *pper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 48.33377 | 4.495621 | 10.7513 | 3.18E-10 | 39.01042 | 57.65711 | 39.01042 | 57.65711 |
| UMBRELL/ | 2.038051 | 0.130617 | 15.60328 | 2.22E-13 | 1.767168 | 2.308934 | 1.767168 | 2.308934 |

RESIDUAL OUTPUT

| *Observation* | *Predicted RAINFALL* | *Residuals* |
|---|---|---|
| 1 | 78.90453 | 3.095467 |
| 2 | 99.28504 | -6.78504 |
| 3 | 82.98063 | 0.219365 |
| 4 | 105.3992 | -7.6992 |
| 5 | 131.8939 | 0.006138 |
| 6 | 144.1222 | -2.82217 |
| 7 | 150.2363 | 15.16368 |
| 8 | 142.0841 | -2.08412 |
| 9 | 123.7417 | 2.958343 |
| 10 | 93.17089 | 4.62911 |
| 11 | 89.09479 | -2.89479 |
| 12 | 109.4753 | -9.8753 |
| 13 | 76.86648 | 10.13352 |
| 14 | 103.3611 | -5.86115 |
| 15 | 76.86648 | 11.33352 |
| 16 | 109.4753 | -6.7753 |
| 17 | 135.97 | -12.97 |
| 18 | 148.1983 | -1.89827 |
| 19 | 148.1983 | 11.80173 |
| 20 | 138.008 | 6.991985 |
| 21 | 127.8178 | 3.88224 |
| 22 | 121.7036 | -3.70361 |
| 23 | 89.09479 | 2.105212 |
| 24 | 113.5514 | -8.9514 |