**HI6007 STATISTICS FOR BUSINESS DECISIONS**

**(Assignment Answers)**

Part A

According to the given data set, the below graph is suitable i.e., marks trend line for on campus teaching before and after Covid 19 pandemic.

From this graph, we can say that the marks line in case of online learning (that is after Covid 19) is upper mostly times as compared to on campus line. Mostly, students achieved highest marks when the study mode is online learning (see right side of the graph). Hence, the online mode of study is found to be better as compared to offline mode because online study may create a sense of isolation and strong motivation to stay focused. Thus, students can improve their grades. As a result, marks in online learning after Covid 19 pandemic is higher as compared on campus teaching.

One more simple and suitable chart for On campus and Online marks.

The demerit of this chart is that we can’t compare both the charts because the bins are different but still the above charts clearly shows that the students are better performed in case on online learning teaching as compared to on campus teaching.

Part B

1. In this given scenario, we could use the Stratified method of sampling as all Australian banks divided into subgroups/strata who have a similar Characteristic. It's applied when there's a chance that the measurement of interest will differ between subgroups, and we want to make sure that all of them are represented. Thus, the Stratified method of sampling is best fit for data collection, and it gives the fruitful statistical analysis results.

2. In this given scenario, we can use the clustered sampling method because institute wants to examine the difficulties faced by students during Covid 19 pandemic. So, they can survey for all the students and make clustered for all the students who face the difficulties and the perform statistical analysis on the collective data.

3. The WHO can pick up the data from the random hospital and assess the relationship between Covid 19 mortality and age. Therefore, the method of sampling is random sampling. Additionally, the correlation statistical analysis is helps to know the relation between the Covid 19 mortality and age.

4. In this given scenario, the Victorian Premier gather the data during the Covid 19 and make a cluster from the data of working employees and sacked employees. Therefore, the clustered method of sampling is used and instead of sampling individual employees from each subgroup, they can randomly select entire subgroups.

5. The Judgement (or purposive) sampling method is suitable for the scenario. It is a qualitive research because Queensland police (QSR) would like to know the peoples experience of driving about a specified phenomenon that is newly opened highway between metro and regional Queensland. However, this sampling might not effective because the size of the population is large. Therefore, we can divide the population between the metro and regional Queensland and make a subgroup of it and then Judgement sampling method is effective.

PART C

a.

b.

c. **Observations selected from 1 to 50.**

1. Table for Descriptive Statistics.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Summary measures for selected variables** | | | | |
|  | Weeks of pay | Age of Employee | No of years with the company | Annual Salary ($000) |
| Count | 49.000 | 49.000 | 49.000 | 49.000 |
| Mean | 11.496 | 35.056 | 13.127 | 37.015 |
| Median | 12.100 | 34.850 | 12.000 | 37.800 |
| Mode | 12.100 | 31.45 | 22.8 | 37.8 |
| Standard deviation | 3.607 | 6.514 | 5.743 | 5.923 |
| Variance | 13.007 | 42.427 | 32.984 | 35.082 |
| Skewness | -0.092 | 0.078 | 0.372 | 0.197 |
| Kurtosis | -0.145 | 0.263 | -0.665 | 0.408 |
| coefficient of variation | 31.37227449 | 18.58059632 | 43.75270715 | 16.00155243 |

2.

* Normal Distribution of Weeks of Pay

The charts shows that the normal distribution. In other words, the skewness value is lie in between -0.5 and +0.5 which indicate that the data are highly symmetrical.

* Normal Distribution of Age of Employee

The charts shows that the normal distribution. In other words, the skewness value is lie in between -0.5 and +0.5 which indicate that the data are highly symmetrical.

* Normal Distribution of No of years with the company

The charts shows that the data is normal distribution. In other words, the skewness value is lie in between -0.5 and +0.5 which indicate that the data are highly symmetrical.

* Normal Distribution of Annual Salary

The charts shows that the data is normal distribution. In other words, the skewness value is lie in between -0.5 and +0.5 which indicate that the data are highly symmetrical.

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a perfect relationship between the weeks of pay and age of employee i.e., the strength is +1.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a positive perfect relationship between the weeks of pay and no, of years with the company i.e., the strength is 0.97.

* Weeks of Pay and Annual Salary

There is a positive and perfect relationship between the weeks of pay and annual salary i.e., the strength is 0.98.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | | | | | | |
| *Regression Statistics* | | | | | | |
| Multiple R | 0.99067401 |  |  |  |  |  |
| R Square | 0.981434993 |  |  |  |  |  |
| Adjusted R Square | 0.980197326 |  |  |  |  |  |
| Standard Error | 0.507518168 |  |  |  |  |  |
| Observations | 49 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA | | | | | | |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 612.7483226 | 204.2494409 | 792.9717 | 0.000000 |  |
| Residual | 45 | 11.59086109 | 0.257574691 |  |  |  |
| Total | 48 | 624.3391837 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | -7.642515184 | 1.303892418 | -5.861308093 | 5.01411E-07 | -10.26868932 | -5.016341046 |
| Age of Employee | 0.337961827 | 0.061701704 | 5.477349966 | 1.85002E-06 | 0.213688216 | 0.462235438 |
| No of years with the company | 0.062379864 | 0.060984746 | 1.022876505 | 0.311833827 | -0.06044972 | 0.185209448 |
| Annual Salary ($000) | 0.17484581 | 0.065874335 | 2.654232621 | 0.010948822 | 0.042168088 | 0.307523532 |

Regression Equation:

Where Y(hat) is the weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* Expected redundancy pay for 40years
* Worked 14 years
* Last annual salary ($000) is 45.

So,

Thus, the estimated of weeks of pay is 14.617 or 15.

b. Interpretation of slope coefficients.

* The slope B1 = 0.3378, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to increase 0.3378.
* The slope of B2 = 0.062, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.062.
* The slope of B3 = 0.1748, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to increase 0.062.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.98 (or 98%), the interpretation is that 98% of the variation in the dependent variable can be explained by the variation in the independent variables. Thus, the larger the R square means that the model is best fit.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of all the variables (except no. of years with the company) is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that all the independent variables are statistically significant except no. of years with the company.

f. The correlation coefficient between the explanatory variables is positive and perfect relationship.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Table of correlations*** | | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.973 | 1.000 |  |
| Annual Salary ($000) | 0.979 | 0.972 | 1.000 |

g. We could add two new variables i.e., education and family size. Education variable is important because education of the employees’ matter, or skill employees are better as compared to less educated or less skilled workers. Thus, the less employees redundant. On the other hand, the family size matters because if the size of the family is large then the chance of employee to work with the business is more otherwise less.

* **Observations selected from 10 to 59.**

C.

1. Table for Descriptive Statistics.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Summary measures for selected variables*** | | | | |
|  | Weeks of pay | Age of Employee | No of years with the company | Annual Salary ($000) |
| Count | 50.000 | 50.000 | 50.000 | 50.000 |
| Mean | 11.022 | 35.735 | 12.552 | 36.291 |
| Median | 11.000 | 35.700 | 12.500 | 36.750 |
| Mode | 11 | 34.000 | 10.000 | 37.800 |
| Standard deviation | 3.625 | 6.572 | 5.619 | 5.440 |
| Variance | 13.139 | 43.188 | 31.572 | 29.595 |
| Skewness | 0.107 | -0.001 | 0.295 | 0.043 |
| Kurtosis | -0.024 | -0.084 | -0.449 | 0.620 |
| Coefficient of variation | 0.328871123 | 0.183902956 | 0.447646157 | 0.149903148 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

All the charts shows that the data is normal distribution. In other words, the skewness value is lie in between -0.5 and +0.5 which indicates that the data are highly symmetrical.

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.48.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.7194.

* Weeks of Pay (Dependent) and Annual Salary ($000) (Independent)

There is no correlation between weeks of pay and annual salary.

4.

We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Results of multiple regression for Weeks of pay*** | | | | | | | |
| ***Summary measures*** | |  |  |  |  |  |  |
|  | Multiple R | 0.7356 |  |  |  |  |  |
|  | R-Square | 0.5410 |  |  |  |  |  |
|  | Adj R-Square | 0.5111 |  |  |  |  |  |
|  | StErr of Est | 2.5345 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ***ANOVA Table*** | |  |  |  |  |  |  |
|  | Source | df | SS | MS | F | p-value |  |
|  | Explained | 3 | 348.3376 | 116.1125 | 18.0758 | 0.0000 |  |
|  | Unexplained | 46 | 295.4882 | 6.4237 |  |  |  |
|  |  |  |  |  |  |  |  |
| ***Regression coefficients*** | |  |  |  |  |  |  |
|  |  | Coefficient | Std Err | t-value | p-value | Lower limit | Upper limit |
|  | Constant | 9.3550 | 3.1452 | 2.9744 | 0.0047 | 3.0241 | 15.6859 |
|  | Age of Employee | -0.1282 | 0.0915 | -1.4018 | 0.1677 | -0.3124 | 0.0559 |
|  | No of years with the company | 0.5887 | 0.1063 | 5.5357 | 0.0000 | 0.3746 | 0.8028 |
|  | Annual Salary ($000) | -0.0314 | 0.0680 | -0.4619 | 0.6463 | -0.1683 | 0.1055 |

Regression Equation:

Where Y(hat) is the weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* Expected redundancy pay for 40years
* Worked 14 years
* Last annual salary ($000) is 45.

So,

Thus, the estimated of weeks of pay is 11.054 or 11.

b. Interpretation of slope coefficients.

* The slope B1 = -0.1282, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.3378.
* The slope of B2 = 0.5887, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.5887.
* The slope of B3 = -0.0314, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.062.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.54 (or 54%), the interpretation is that 54% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of Correlations*** | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.795 | 1.000 |  |
| Annual Salary ($000) | 0.204 | 0.174 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.795. However, there is low strength in between the age of employee and annual salary i.e., 0.204.

g. Same as above.

* **Observations selected from 15 to 64.**

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Summary measures for selected variables*** | | | | |
|  | Weeks of pay | Age of Employee | No of years with the company | Annual Salary ($000) |
| Count | 50.000 | 50.000 | 50.000 | 50.000 |
| Mean | 11.240 | 36.419 | 12.728 | 36.478 |
| Median | 11.000 | 35.850 | 13.000 | 36.750 |
| Mode | 11.000 | 31.45 | 12 | 38.85 |
| Standard deviation | 3.854 | 7.082 | 6.017 | 5.268 |
| Variance | 14.853 | 50.149 | 36.200 | 27.751 |
| Skewness | 0.005 | 0.135 | 0.240 | 0.137 |
| Kurtosis | -0.317 | -0.282 | -0.510 | 0.583 |
| Coefficient of variation | 0.34287491 | 0.19444758 | 0.472712041 | 0.144413498 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.58.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.76.

* Weeks of Pay (Dependent) and Annual Salary ($000) (Independent

There is no (or less) correlation between weeks of pay and annual salary.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.7638 |  |  |  |  |  |
| R Square | 0.5834 |  |  |  |  |  |
| Adjusted R Square | 0.5562 |  |  |  |  |  |
| Standard Error | 2.5674 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 424.5649 | 141.5216 | 21.4699 | 0.0000 |  |
| Residual | 46 | 303.2151 | 6.5916 |  |  |  |
| Total | 49 | 727.7800 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 8.3135 | 3.4345 | 2.4206 | 0.0195 | 1.4002 | 15.2268 |
| Age of Employee | -0.0859 | 0.0928 | -0.9254 | 0.3596 | -0.2726 | 0.1009 |
| No of years with the company | 0.5746 | 0.1100 | 5.2257 | 0.0000 | 0.3533 | 0.7959 |
| Annual Salary ($000) | -0.0345 | 0.0709 | -0.4873 | 0.6284 | -0.1772 | 0.1081 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

11.3691

Thus, the estimated of weeks of pay is 11.3691 or 11.

b. Interpretation of slope coefficients.

* The slope B1 = -0.0859, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.0859.
* The slope of B2 = 0.5746, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.5887.
* The slope of B3 = -0.0345, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0345.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.5834 (or 58.34%), the interpretation is that 58.34% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of correlations*** | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.830 | 1.000 |  |
| Annual Salary ($000) | 0.146 | 0.186 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.830. However, there is low strength in between the age of employee and annual salary i.e., 0.146.

g. Same as above.

* Observations selected from 20-69

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Summary measures for selected variables*** | | |  |  |
|  | Weeks of pay | Age of Employee | No of years with the company | Annual Salary ($000) |
| Count | 50.000 | 50.000 | 50.000 | 50.000 |
| Mean | 11.314 | 37.383 | 12.992 | 35.695 |
| Median | 11.000 | 37.200 | 13.100 | 36.000 |
| Mode | 11.000 | 34.000 | 6.000 | 37.800 |
| Standard deviation | 3.860 | 7.368 | 6.162 | 5.663 |
| Variance | 14.902 | 54.287 | 37.967 | 32.069 |
| Skewness | -0.001 | -0.048 | 0.091 | 0.027 |
| Kurtosis | -0.389 | -0.481 | -0.713 | 0.618 |
| Coefficient of variation | 0.341 | 0.197 | 0.474 | 0.159 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.53.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.75.

* Weeks of Pay (Dependent) and Annual Salary (Independent)

There is no (or less) correlation between weeks of pay and annual salary.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.7667 |  |  |  |  |  |
| R Square | 0.5878 |  |  |  |  |  |
| Adjusted R Square | 0.5610 |  |  |  |  |  |
| Standard Error | 2.5579 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 429.2496 | 143.0832 | 21.8687 | 0.0000 |  |
| Residual | 46 | 300.9706 | 6.5428 |  |  |  |
| Total | 49 | 730.2202 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 8.6584 | 3.2281 | 2.6822 | 0.0101 | 2.1605 | 15.1562 |
| Age of Employee | -0.1234 | 0.0843 | -1.4647 | 0.1498 | -0.2931 | 0.0462 |
| No of years with the company | 0.5947 | 0.1028 | 5.7842 | 0.0000 | 0.3878 | 0.8017 |
| Annual Salary ($000) | -0.0128 | 0.0670 | -0.1907 | 0.8496 | -0.1477 | 0.1222 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

11.47

Thus, the estimated of weeks of pay is 11.47 or 11.

b. Interpretation of slope coefficients.

* The slope B1 = -0.1234, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.1234.
* The slope of B2 = 0.5947, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.5947.
* The slope of B3 = -0.0128, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0128.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.5878 (or 59%), the interpretation is that 59% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of correlations*** | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.808 | 1.000 |  |
| Annual Salary ($000) | 0.179 | 0.265 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.81. However, there is low strength in between the age of employee and annual salary i.e., 0.18.

g. same as above.

* Observations selected from 25-74

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Summary measures for selected variables*** | | | | |
|  | Weeks of pay | Age of Employee | No of years with the company | Annual Salary ($000) |
| Count | 50.0000 | 50.0000 | 50.0000 | 50.0000 |
| Mean | 10.9420 | 37.6070 | 12.6880 | 36.0160 |
| Median | 11.0 | 37.2 | 13.0 | 36.0 |
| Mode | 11.0 | 44.0 | 6.0 | 37.8 |
| Standard deviation | 3.8387 | 7.1166 | 6.0425 | 5.6159 |
| Variance | 14.7360 | 50.6461 | 36.5113 | 31.5382 |
| Skewness | 0.1749 | 0.0271 | 0.2256 | -0.0839 |
| Kurtosis | -0.2436 | -0.4644 | -0.5768 | 0.7445 |
| Coefficient of variation | 0.3508 | 0.1892 | 0.4762 | 0.1559 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.51.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.76.

* Weeks of Pay (Dependent) and Annual Salary (Independent)

There is no (or less) correlation between weeks of pay and annual salary i.e., 0.20.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.781019759 |  |  |  |  |  |
| R Square | 0.609991864 |  |  |  |  |  |
| Adjusted R Square | 0.584556551 |  |  |  |  |  |
| Standard Error | 2.474258679 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 440.4518 | 146.8173 | 23.9821 | 0.0000 |  |
| Residual | 46 | 281.6100 | 6.1220 |  |  |  |
| Total | 49 | 722.0618 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 9.5165 | 3.1469 | 3.0241 | 0.0041 | 3.1822 | 15.8509 |
| Age of Employee | -0.1323 | 0.0805 | -1.6426 | 0.1073 | -0.2944 | 0.0298 |
| No of years with the company | 0.6205 | 0.0974 | 6.3707 | 0.0000 | 0.4244 | 0.8165 |
| Annual Salary ($000) | -0.0409 | 0.0665 | -0.6147 | 0.5418 | -0.1747 | 0.0929 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

11.072

Thus, the estimated of weeks of pay is 11.072 or 11.

b. Interpretation of slope coefficients.

* The slope B1 = -0.1323, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.1323.
* The slope of B2 = 0.6205, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.6205.
* The slope of B3 = -0.0409, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0409.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.61 (or 61%), the interpretation is that 61% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of correlations*** | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.787 | 1.000 |  |
| Annual Salary ($000) | 0.232 | 0.320 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.79. However, there is low strength in between the age of employee and annual salary i.e., 0.23.

g. same as above.

* Observations selected from 30 to 79.

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Weeks of pay* |  | *Age of Employee* |  | *No of years with the company* |  | *Annual Salary ($000)* |  |
| Count | 50 | Count | 50 | Count | 50 | Count | 50 |
| Mean | 10.8740 | Mean | 38.1290 | Mean | 12.5640 | Mean | 35.5840 |
| Standard Error | 0.5522 | Standard Error | 1.0696 | Standard Error | 0.8566 | Standard Error | 0.8114 |
| Median | 11.0000 | Median | 38.6250 | Median | 13.0000 | Median | 35.3500 |
| Mode | 11.0000 | Mode | 44.0000 | Mode | 12.0000 | Mode | 34.6500 |
| Standard Deviation | 3.9047 | Standard Deviation | 7.5634 | Standard Deviation | 6.0570 | Standard Deviation | 5.7375 |
| Sample Variance | 15.2465 | Sample Variance | 57.2049 | Sample Variance | 36.6868 | Sample Variance | 32.9185 |
| Kurtosis | -0.3587 | Kurtosis | -0.7024 | Kurtosis | -0.5646 | Kurtosis | 0.4985 |
| Skewness | 0.1893 | Skewness | -0.0661 | Skewness | 0.1828 | Skewness | 0.0834 |
| CV | 0.3591 | CV | 0.1984 | CV | 0.4821 | CV | 0.1612 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.53.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.77.

* Weeks of Pay (Dependent) and Annual Salary (Independent)

There is no (or less) correlation between weeks of pay and annual salary i.e., 0.18.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.7831 |  |  |  |  |  |
| R Square | 0.6133 |  |  |  |  |  |
| Adjusted R Square | 0.5880 |  |  |  |  |  |
| Standard Error | 2.5062 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 458.1549 | 152.7183 | 24.3147 | 0.0000 |  |
| Residual | 46 | 288.9213 | 6.2809 |  |  |  |
| Total | 49 | 747.0762 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 9.5699 | 3.2445 | 2.9496 | 0.0050 | 3.0391 | 16.1008 |
| Age of Employee | -0.1327 | 0.0799 | -1.6613 | 0.1035 | -0.2935 | 0.0281 |
| No of years with the company | 0.6401 | 0.1030 | 6.2128 | 0.0000 | 0.4327 | 0.8475 |
| Annual Salary ($000) | -0.0472 | 0.0659 | -0.7159 | 0.4776 | -0.1797 | 0.0854 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

11.1009

Thus, the estimated of weeks of pay is 11.1009 or 11.

b. Interpretation of slope coefficients.

* The slope B1 = -0.1327, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.1327.
* The slope of B2 = 0.6401, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.6401.
* The slope of B3 = -0.0472, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0472.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.61 (or 61%), the interpretation is that 61% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of correlations*** | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.801 | 1.000 |  |
| Annual Salary ($000) | 0.153 | 0.291 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.80. However, there is low strength in between the age of employee and annual salary i.e., 0.15.

g. same as above.

* Observations selected from 35-84

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Weeks of pay* |  | *Age of Employee* |  | *No of years with the company* |  | *Annual Salary ($000)* |  |
| Count | 50 | Count | 50 | Count | 50 | Count | 50 |
| Mean | 10.854 | Mean | 39.111 | Mean | 12.744 | Mean | 35.349 |
| Standard Error | 0.531476265 | Standard Error | 1.064047231 | Standard Error | 0.83990359 | Standard Error | 0.818012138 |
| Median | 11 | Median | 40.4 | Median | 13.1 | Median | 35.35 |
| Mode | 10 | Mode | 44 | Mode | 12 | Mode | 36 |
| Standard Deviation | 3.758104711 | Standard Deviation | 7.523950127 | Standard Deviation | 5.939015242 | Standard Deviation | 5.784219295 |
| Sample Variance | 14.12335102 | Sample Variance | 56.60982551 | Sample Variance | 35.27190204 | Sample Variance | 33.45719286 |
| Kurtosis | -0.09169431 | Kurtosis | -0.60229691 | Kurtosis | -0.54907884 | Kurtosis | 0.459082484 |
| Skewness | 0.213808887 | Skewness | -0.26339434 | Skewness | 0.05262283 | Skewness | 0.152923847 |
| CV | 0.346241451 | CV | 0.192374271 | CV | 0.46602442 | CV | 0.163631766 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.53.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.76.

* Weeks of Pay (Dependent) and Annual Salary (Independent)

There is no (or less) correlation between weeks of pay and annual salary i.e., 0.20.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.7879 |  |  |  |  |  |
| R Square | 0.6208 |  |  |  |  |  |
| Adjusted R Square | 0.5961 |  |  |  |  |  |
| Standard Error | 2.3884 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 429.6382 | 143.2127 | 25.1053 | 0.0000 |  |
| Residual | 46 | 262.4060 | 5.7045 |  |  |  |
| Total | 49 | 692.0442 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 10.7146 | 3.2934 | 3.2534 | 0.0021 | 4.0854 | 17.3438 |
| Age of Employee | -0.1680 | 0.0821 | -2.0456 | 0.0465 | -0.3332 | -0.0027 |
| No of years with the company | 0.6761 | 0.1084 | 6.2399 | 0.0000 | 0.4580 | 0.8942 |
| Annual Salary ($000) | -0.0540 | 0.0635 | -0.8500 | 0.3997 | -0.1818 | 0.0738 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

11.03

Thus, the estimated of weeks of pay is 11.03 or 11.

b. Interpretation of slope coefficients.

* The slope B1 = -0.1680, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.1680.
* The slope of B2 = 0.6761, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.6761.
* The slope of B3 = -0.0540, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0540.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.62 (or 62%), the interpretation is that 62% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of all the variables (except no. of years with the company) is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that all the independent variables are statistically significant except no. of years with the company.

f.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Table of correlations*** | | | | |
|  | Weeks of pay | Age of Employee | No of years with the company | Annual Salary ($000) |
| Weeks of pay | 1.000 |  |  |  |
| Age of Employee | 0.533 | 1.000 |  |  |
| No of years with the company | 0.765 | 0.826 | 1.000 |  |
| Annual Salary ($000) | 0.203 | 0.150 | 0.315 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.83. However, there is low strength in between the age of employee and annual salary i.e., 0.15.

g. same as above.

* **Observations selected from 45 to 94.**

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Weeks of pay* |  | *Age of Employee* |  | *No of years with the company* |  | *Annual Salary ($000)* |  |
| Count | 50 | Count | 50 | Count | 50 | Count | 50 |
| Mean | 10.278 | Mean | 39.826 | Mean | 12.34 | Mean | 35.137 |
| Standard Error | 0.481556066 | Standard Error | 1.005043648 | Standard Error | 0.794167514 | Standard Error | 0.772191171 |
| Median | 10.5 | Median | 41 | Median | 13 | Median | 35.5 |
| Mode | 11 | Mode | 44 | Mode | 15 | Mode | 36 |
| Standard Deviation | 3.405115599 | Standard Deviation | 7.10673179 | Standard Deviation | 5.615612348 | Standard Deviation | 5.460216132 |
| Sample Variance | 11.59481224 | Sample Variance | 50.50563673 | Sample Variance | 31.53510204 | Sample Variance | 29.8139602 |
| Kurtosis | -0.395918662 | Kurtosis | -0.637995188 | Kurtosis | -0.459268479 | Kurtosis | 0.504782811 |
| Skewness | -0.044641417 | Skewness | -0.306646269 | Skewness | -0.003732127 | Skewness | 0.133919889 |
| CV | 0.331301382 | Count | 0.178444528 | Count | 0.455073934 | Count | 0.155397903 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.66.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.80.

* Weeks of Pay (Dependent) and Annual Salary (Independent)

There is no (or less) correlation between weeks of pay and annual salary i.e., 0.11.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.8074 |  |  |  |  |  |
| R Square | 0.6519 |  |  |  |  |  |
| Adjusted R Square | 0.6292 |  |  |  |  |  |
| Standard Error | 2.0736 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 370.3540 | 123.4513 | 28.7108 | 0.0000 |  |
| Residual | 46 | 197.7918 | 4.2998 |  |  |  |
| Total | 49 | 568.1458 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 7.8800 | 3.0885 | 2.5514 | 0.0141 | 1.6631 | 14.0969 |
| Age of Employee | -0.0645 | 0.0837 | -0.7705 | 0.4449 | -0.2330 | 0.1040 |
| No of years with the company | 0.5698 | 0.1079 | 5.2808 | 0.0000 | 0.3526 | 0.7870 |
| Annual Salary ($000) | -0.0587 | 0.0563 | -1.0436 | 0.3021 | -0.1721 | 0.0546 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

10.63

Thus, the estimated of weeks of pay is 10.63 or 10.

b. Interpretation of slope coefficients.

* The slope B1 = -0.0645, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0. 0645.
* The slope of B2 = 0.5698, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.5698.
* The slope of B3 = -0.0587, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0587.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.65 (or 65%), the interpretation is that 65% of the variation in the dependent variable can be explained by the variation in the independent variables.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of correlations*** |  |  |  |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.865 | 1.000 |  |
| Annual Salary ($000) | 0.157 | 0.244 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.87. However, there is low strength in between the age of employee and annual salary i.e., 0.16.

g. same as above.

* **Observations selected from 50 to 99.**

C.

1. Table for Descriptive Statistics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Weeks of pay* |  | *Age of Employee* |  | *No of years with the company* |  | *Annual Salary ($000)* |  |
| Count | 50 | Count | 50 | Count | 50 | Count | 50 |
| Mean | 9.922 | Mean | 38.988 | Mean | 11.788 | Mean | 34.7370 |
| Standard Error | 0.513 | Standard Error | 1.045 | Standard Error | 0.783 | Standard Error | 0.7024 |
| Median | 10.000 | Median | 40.000 | Median | 12.500 | Median | 35.0000 |
| Mode | 11.000 | Mode | 44.000 | Mode | 15.000 | Mode | 36.0000 |
| Standard Deviation | 3.626 | Standard Deviation | 7.391 | Standard Deviation | 5.537 | Standard Deviation | 4.9668 |
| Sample Variance | 13.145 | Sample Variance | 54.623 | Sample Variance | 30.662 | Sample Variance | 24.6692 |
| Kurtosis | -0.534 | Kurtosis | -0.643 | Kurtosis | -0.766 | Kurtosis | 0.6366 |
| Skewness | 0.047 | Skewness | -0.418 | Skewness | -0.037 | Skewness | -0.1145 |
| Coefficient of Variation (CV) | 0.365 | CV | 0.190 | CV | 0.470 | CV | 0.1430 |

2.

* Normal Distribution of Weeks of Pay
* Normal Distribution of Age of Employee
* Normal Distribution of No of years with the company
* Normal Distribution of Annual Salary

All the charts shows that the data is normal distributed. In other words, the skewness value is lie in between -0.5 and +0.5 which indicate that the data are highly symmetrical.

3. The relationship between dependent variable and each independent variable.

* Weeks of Pay (Dependent) and Age of Employee (Independent)

There is a positive relationship between the weeks of pay and age of employee i.e., the strength is 0.70.

* Weeks of Pay (Dependent) and No. of years with the company (Independent)

There is a strong and positive relationship between the weeks of pay and no. of years with the company i.e., the strength is 0.83.

* Weeks of Pay (Dependent) and Annual Salary (Independent)

There is no (or less) correlation between weeks of pay and annual salary i.e., 0.012.

4. We perform a regression analysis and correlation analysis.

a. Regression Output

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ***Regression Statistics*** |  |  |  |  |  |  |
| Multiple R | 0.8402 |  |  |  |  |  |
| R Square | 0.7059 |  |  |  |  |  |
| Adjusted R Square | 0.6867 |  |  |  |  |  |
| Standard Error | 2.0294 |  |  |  |  |  |
| Observations | 50 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **ANOVA** |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 3 | 454.6581 | 151.5527 | 36.7987 | 0.0000 |  |
| Residual | 46 | 189.4477 | 4.1184 |  |  |  |
| Total | 49 | 644.1058 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 6.4044 | 2.9209 | 2.1926 | 0.0334 | 0.5249 | 12.2839 |
| Age of Employee | -0.0236 | 0.0744 | -0.3173 | 0.7525 | -0.1733 | 0.1261 |
| No of years with the company | 0.5792 | 0.0996 | 5.8137 | 0.0000 | 0.3787 | 0.7797 |
| Annual Salary ($000) | -0.0688 | 0.0588 | -1.1706 | 0.2478 | -0.1871 | 0.0495 |

Regression Equation:

Where Y(hat) is the predicted of weeks of pay,

X1:Age of employee

X2: No of years with the company

X3: Annual Salary ($000)

Therefore,

Given that:

* + Expected redundancy pay for 40years
  + Worked 14 years
  + Last annual salary ($000) is 45.

So,

10.47

Thus, the estimated of weeks of pay is 10.47 or 10.

b. Interpretation of slope coefficients.

* The slope B1 = -0.0236, implies that for each increase in 1 year (age), then the value of weeks of pay is estimated to decrease 0.0236.
* The slope of B2 = 0.5792, implies that for each increase of 1 year service, then the value of weeks of pay is estimated to increase 0.5792.
* The slope of B3 = -0.0688, implies that for each increase in thousands of dollars, then the value of weeks of pay is estimated to decrease 0.0688.

c. Interpretation of Coefficient of determination i.e., R\_square

The R square is 0.71 (or 71%), the interpretation is that 71% of the variation in the dependent variable can be explained by the variation in the independent variables. Hence, the model is good fit.

d. Statistically speaking, the significance F (close to zero) is the probability that the null hypothesis in our regression model cannot be rejected.

e. The p-value of the no. of years with the company variables is less than the level of significance (i.e., 0.00 < 0.05). Based on the evidence, we can say that the independent variable (no. of years with the company) is statistically significant except age of employee and annual salary ($000).

f.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Table of correlations*** | | | |
|  | Age of Employee | No of years with the company | Annual Salary ($000) |
| Age of Employee | 1.000 |  |  |
| No of years with the company | 0.849 | 1.000 |  |
| Annual Salary ($000) | 0.046 | 0.096 | 1.000 |

The correlation between the age of employee and no. of years with the company is strongly positive that is 0.85. However, there is low strength in between the age of employee and annual salary i.e., 0.046.

g. same as above.

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