MIS213 Group Assignment

Report about our findings.

Prepared by

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You can click on the question and you can find graph or analyze related to question

2. **Which job has the highest and lowest number of employees?**

Packaging Associate has the lowest number of employees. (22)
Marketing Manager has the highest number of employees. (10)

4. **Which job titles have the majority of employees with the highest educational qualifications?**

Product Manager, in 16 employees there are 10 employees that have highest educational level. (%62.5)
Marketing Specialist**,** in 16 employees there are 10 employees that have highest educational level. (%70)

5. **Which job title has an equal gender distribution?**

Production operator has an equal gender distribution with 10 male and 10 female.

6. **Which positions offer the greatest earning potential?**

Product Manager, Research Scientist, Marketing Manager offer the greatest earning potential.

Means:
Product Manager (82.825)
Research Scientist (77.566)
Marketing Manager (73.530)

7. **Which age groups contain the most employees in the company?**

27-32 age group contain the most employees in the company. (Count: 58 Percent : %42.2)

8. **Which are the top two age groups that have the highest percentage of female and male employees?**

32-37 age group have the highest percentage of female with (%58 female, %42 male)
22-27 age group have the highest percentage of female with(%60 male, %40 female)

10. **Develop a *stem-and-leaf display* for the ages of the employees. Compare this display to the absolute frequency histogram and interpret the shape of distribution based on your findings.**

According to the stem and leaf display, we can see that in the 30,31,33 ages have more employees than others also the sum of data between 27-32 ages result the age group that have most employees. Finally, we ensure about the ages that looking stem and leaf display and frequency histogram

11. **Determine how many employees are eligible for these bonuses, and present the list of their names.**

There are 15 workers that earn less than 35,000.

13. **Make a *contingency table* to examine the relationship between the frequency distributions of employees' educational qualifications and gender relate. Interpret your findings using both row-wise and column-wise percentages.**

Diploma degree has highest percentage of female employees. (%33 in general) (%70.7 in All People that have Diploma Degree)

Bachelor's degree has highest percentage of male employees. (%38.4 in general) (%57.1 in all people that have Bachelor's Degree)

14. **Report the *five-number-summary* for the salaries and leave balances of the staff. Additionally, identify the *range*, *inter-quartile range*, *mean, variance*, *standard deviation*, *coefficient of variation, 30th and 80th percentiles, and skewness* for these two numerical variables. What observations might you draw from these characteristics?**

The salary data ranges from $28,900 to $85,000, with an average of $54,231.06 and a median of $51,100. The average is a bit higher than the middle value, showing a slight upward skew due to some high salaries. Salaries have a moderate spread, with a standard deviation of $16,635.603 and a 31% variation compared to the average.

The leave balance ranges from 2 to 37 days, with an average of 16.42 and a median of 16. This balance data is almost symmetrical, meaning most values are close to the center. It has a moderate spread, with a standard deviation of 4.981 and 30% variation compared to the average, showing that leave days are fairly consistent among staff.

15. **Create two *histograms* for the salaries and leave balances of employees, including normal curves. Interpret the shapes of the distributions for each variable (i.e., symmetric, left- skewed, or right-skewed).**

The salary distribution is roughly symmetric with a slight right skew, as a few higher salaries stretch the data to the right.

The leave balance distribution is also nearly symmetric but slightly right-skewed, with most values clustered around the center and a few higher balances creating a small right tail.

16. **Construct a *box-and-whisker plot* for the salaries and leave balances of the staff. What can you infer about the distribution of the salaries and leave balances among the employees in the company (i.e., symmetric, left-skewed, or right-skewed) Please explain your reasoning?**

Leave Balance: The distribution is generally symmetric, with the median centered in the IQR box. However, a few outliers, like 54 and 145, show that some employees have unusually high or low balances, though most fall within a typical range.

Salary: The salary data is also symmetric, with a well-centered median and balanced whiskers, suggesting a normal distribution. No outliers are present, indicating salaries are relatively consistent.

17. **Create *scatter plot diagram* for the data. Find *covariance* and *correlation coefficient*. Then, explain and comment on the direction and the strength of the relationship between the salaries of employees and their turnover rates.**

Scatter Plot: The scatter plot shows that higher turnover rates correlate with lower salaries, while lower turnover rates are linked to higher salaries.

Correlation and Covariance: The Pearson correlation coefficient is -0.458, indicating a statistically significant moderate negative correlation. The covariance of -1106.019 also suggests an inverse relationship.

Interpretation: As salaries increase, turnover rates tend to decrease. Higher salaries may reduce turnover, though other factors are likely involved.

In summary, raising salaries could lower turnover rates, but additional influences exist.

Yusuf Süsin 2023502186 Kaan Bıçakcı 2020502144 Erkin Emirtekin 2021502141

Frequencies

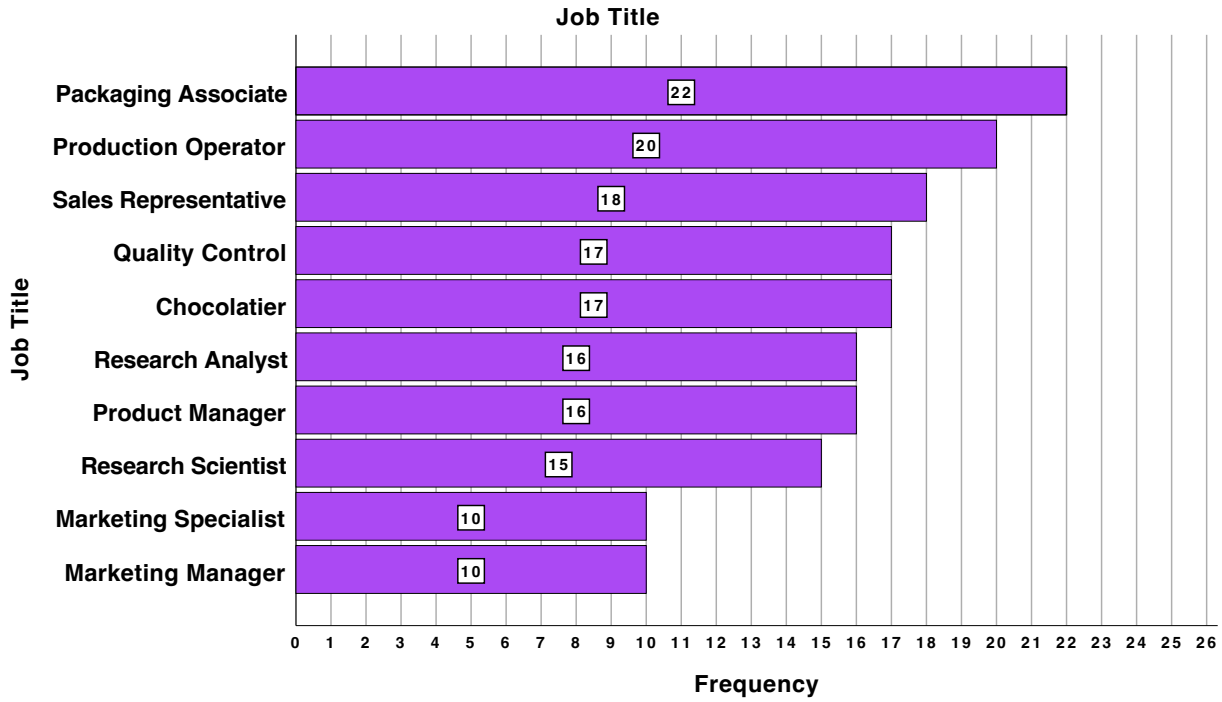
Statistics

Job Title

N	Valid	161
	Missing	0

Job Title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marketing Manager	10	6.2	6.2	6.2
	Marketing Specialist	10	6.2	6.2	12.4
	Research Scientist	15	9.3	9.3	21.7
	Product Manager	16	9.9	9.9	31.7
	Research Analyst	16	9.9	9.9	41.6
	Chocolatier	17	10.6	10.6	52.2
	Quality Control	17	10.6	10.6	62.7
	Sales Representative	18	11.2	11.2	73.9
	Production Operator	20	12.4	12.4	86.3
	Packaging Associate	22	13.7	13.7	100.0
	Total	161	100.0	100.0	



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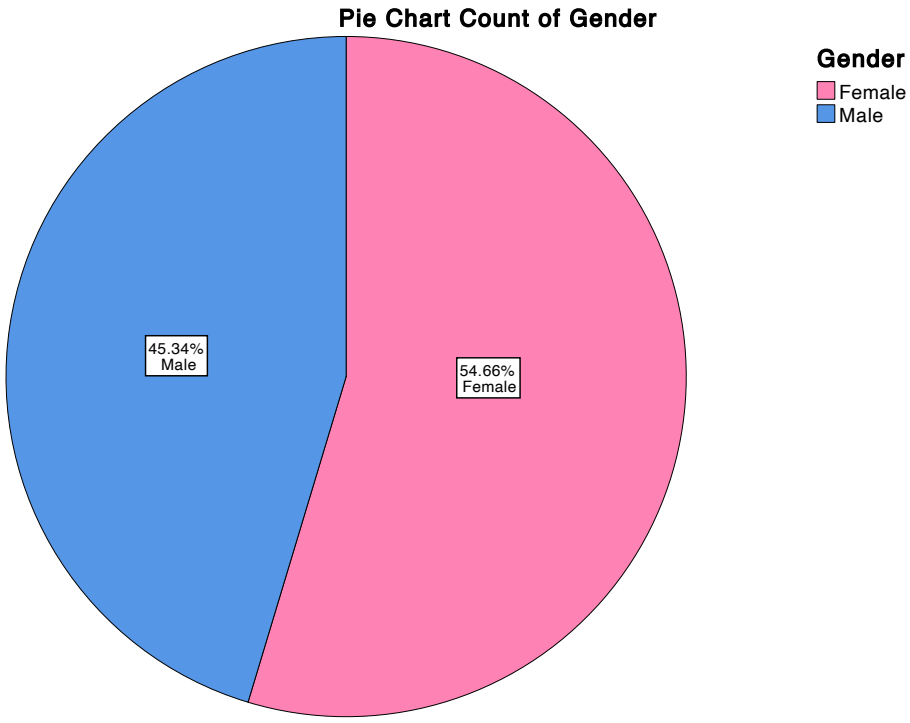
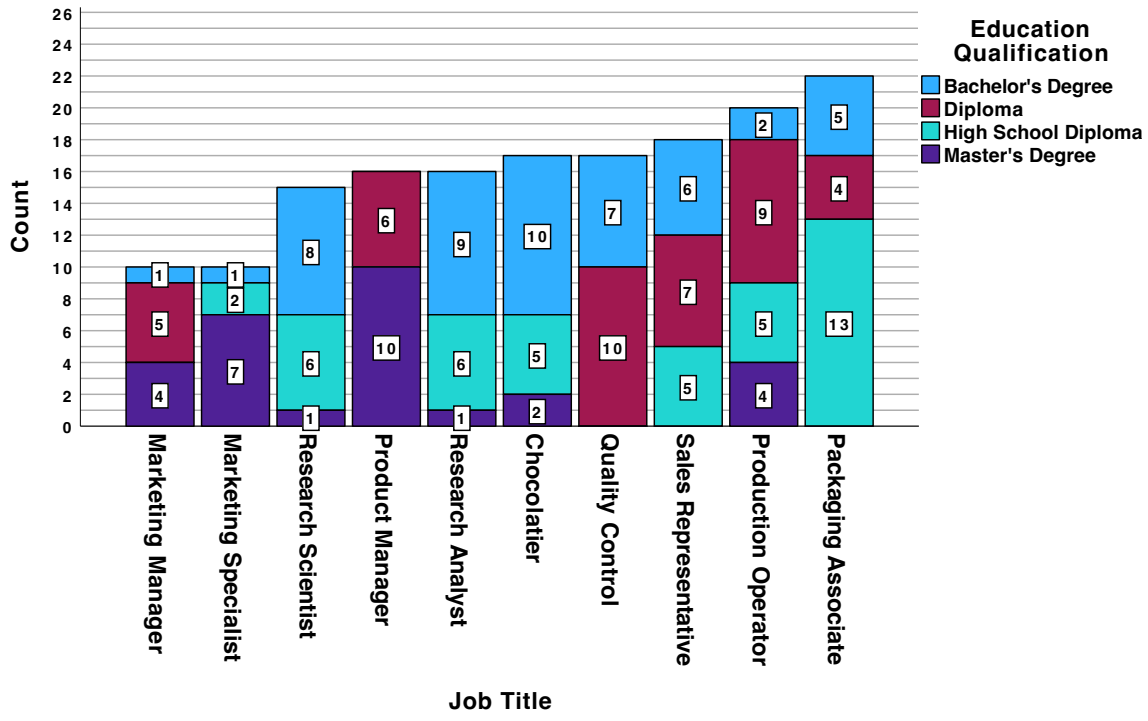


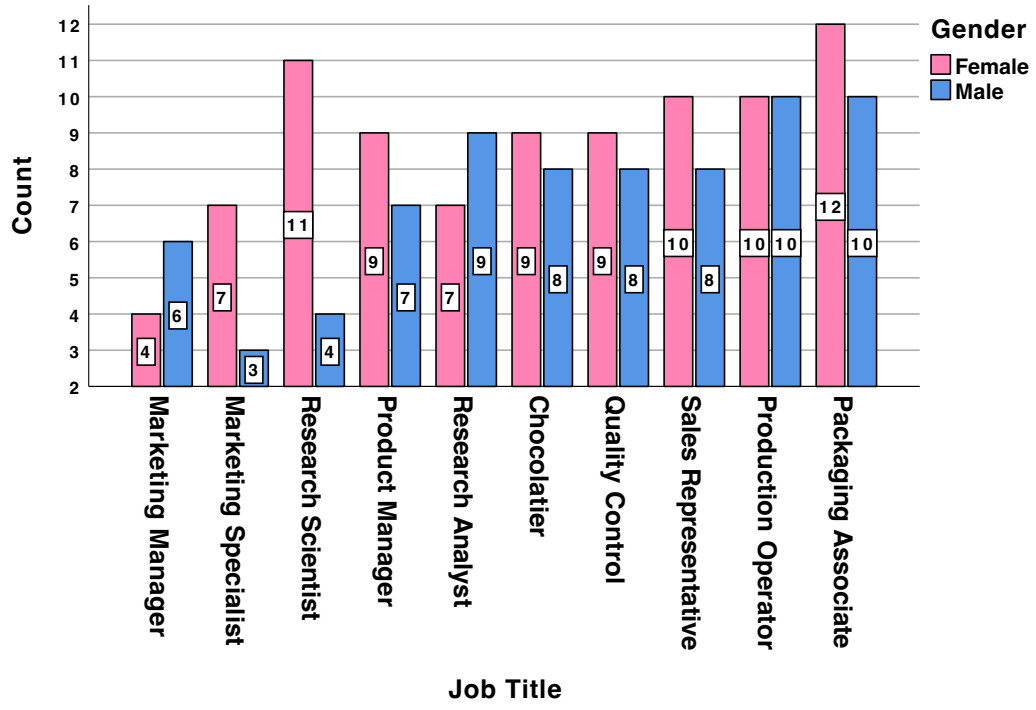
Graph

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	88	54.7	54.7	54.7
	Male	73	45.3	45.3	100.0
	Total	161	100.0	100.0	



Gender-Jobs



Means

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Salary * Job Title	161	100.0%	0	0.0%	161	100.0%

Report

Salary

Job Title	Mean	N	Std. Deviation
Chocolatier	$52,176.47	17	$1,212.708
Marketing Manager	$73,530.00	10	$1,466.705
Marketing Specialist	$62,170.00	10	$1,045.679
Packaging Associate	$33,409.09	22	$2,392.231
Product Manager	$82,825.00	16	$1,318.332
Production Operator	$37,500.00	20	$1,674.892
Quality Control	$43,135.29	17	$1,193.179
Research Analyst	$57,812.50	16	$1,254.791
Research Scientist	$77,566.67	15	$1,026.552
Sales Representative	$47,511.11	18	$1,554.836
Total	$54,231.06	161	$16,635.603

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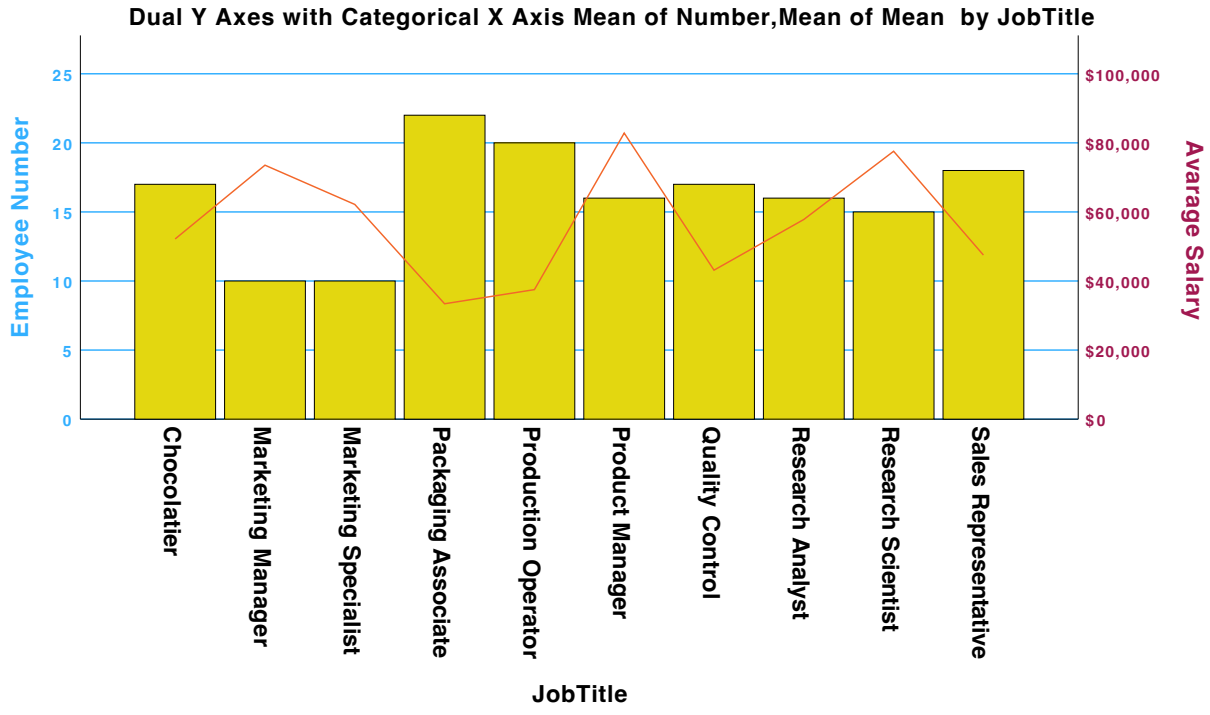
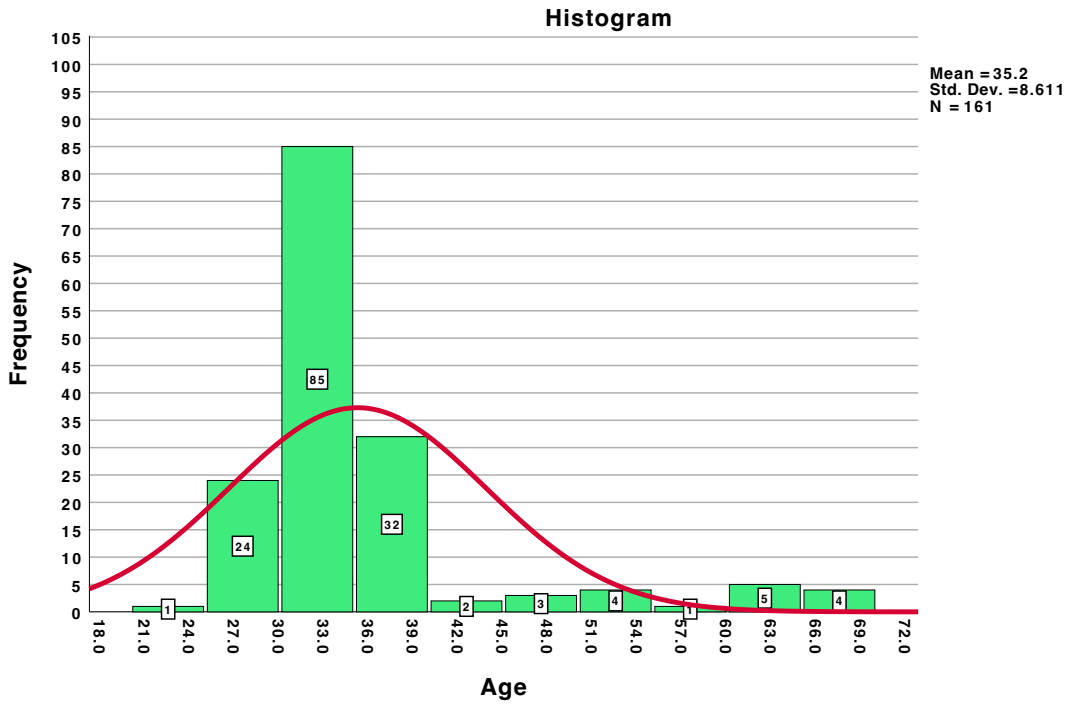


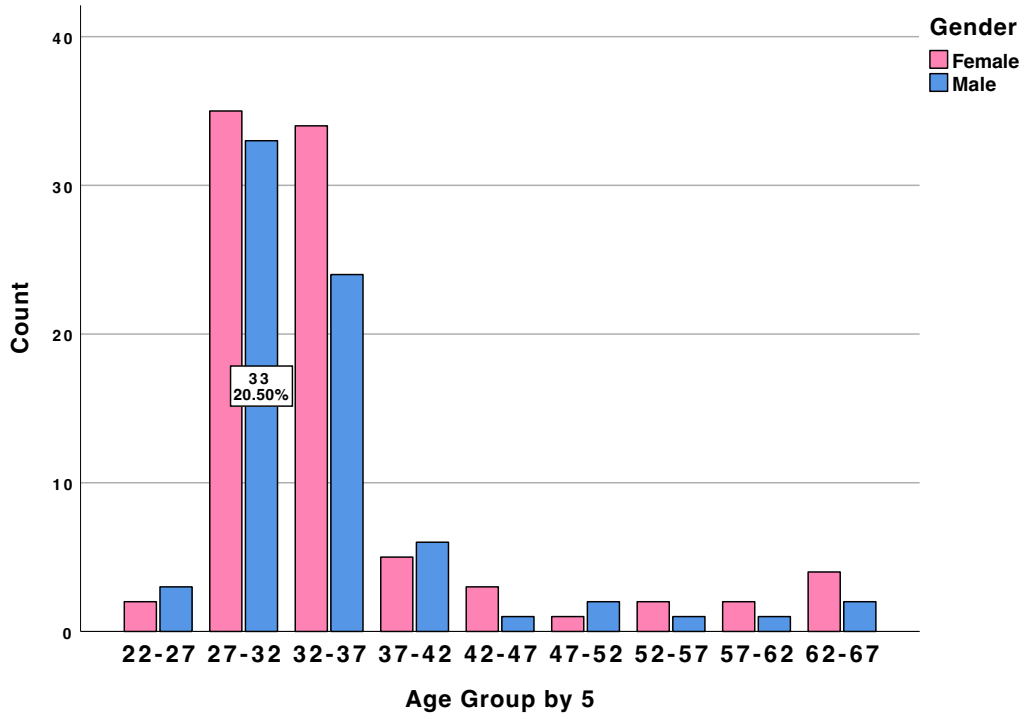
Statistics

Age

N	Valid	161
	Missing	0
Minimum		22.5
Maximum		66.7



Graph



Frequencies

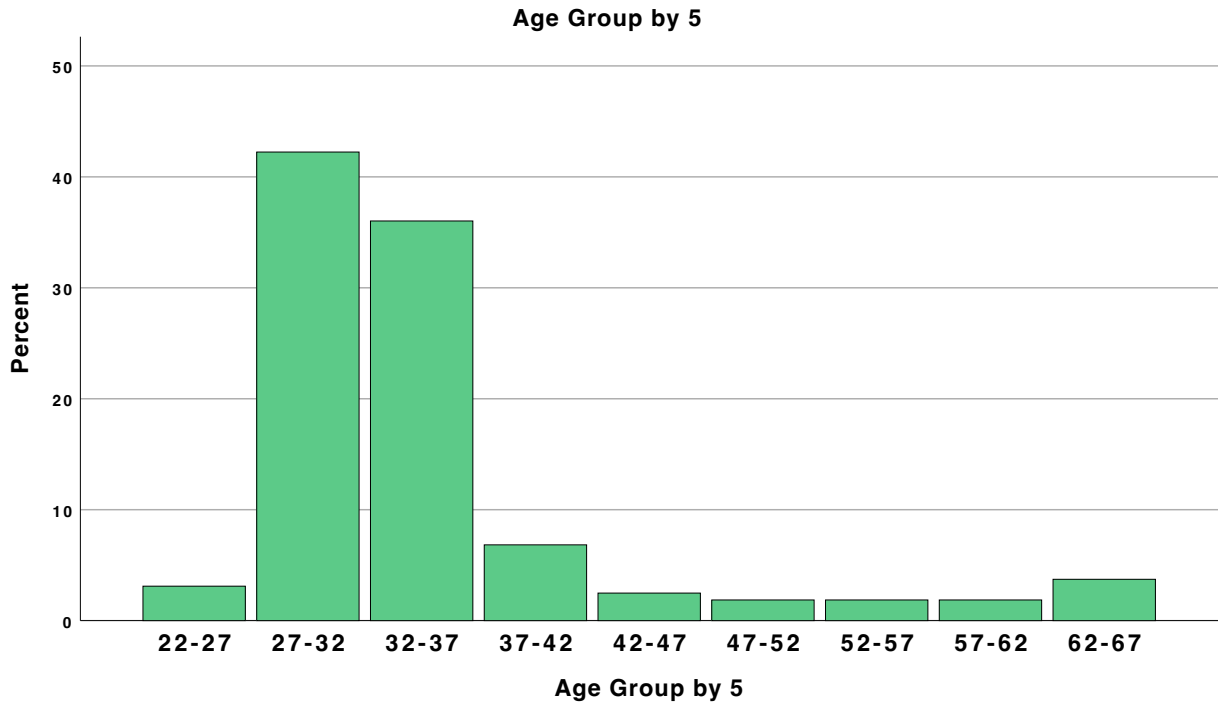
Statistics

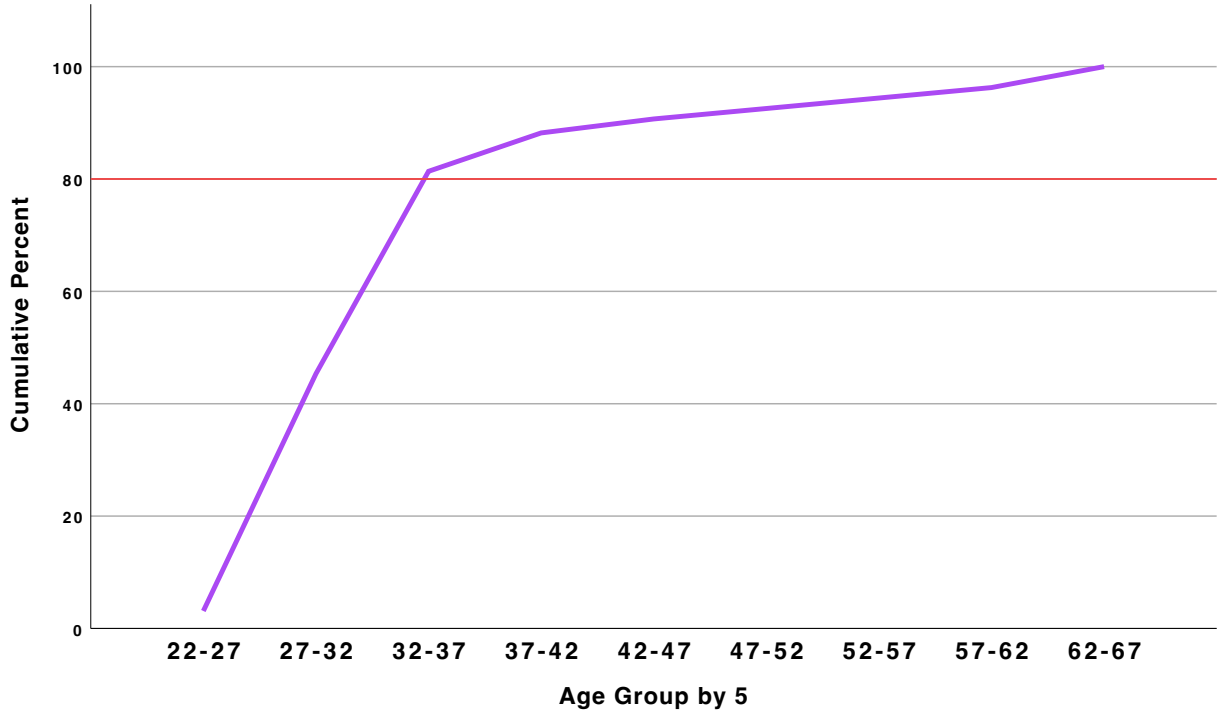
Age Group by 5

N	Valid	161
	Missing	0

Age Group by 5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22-27	5	3.1	3.1	3.1
	27-32	68	42.2	42.2	45.3
	32-37	58	36.0	36.0	81.4
	37-42	11	6.8	6.8	88.2
	42-47	4	2.5	2.5	90.7
	47-52	3	1.9	1.9	92.5
	52-57	3	1.9	1.9	94.4
	57-62	3	1.9	1.9	96.3
	62-67	6	3.7	3.7	100.0
	Total	161	100.0	100.0	





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Explore

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Age	161	100.0%	0	0.0%	161	100.0%

Age

```
Age Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

     1.00 Extremes    (=<22.5)
     3.00       26 .  001
     5.00       27 .  02677
     8.00       28 .  02556789
     8.00       29 .  34566689
    20.00       30 .  00112233334556678999
    28.00       31 .  0000111112233444455666667789
    10.00       32 .  2333557777
    16.00       33 .  0012456777888899
    11.00       34 .  23344688899
    11.00       35 .  00012346799
    10.00       36 .  0123336888
     7.00       37 .  1247899
     2.00       38 .  03
     2.00       39 .  58
      .00       40 .
      .00       41 .
     1.00       42 .  6
    18.00 Extremes    (>=44.1)

 Stem width:   1.0
 Each leaf:        1 case(s)
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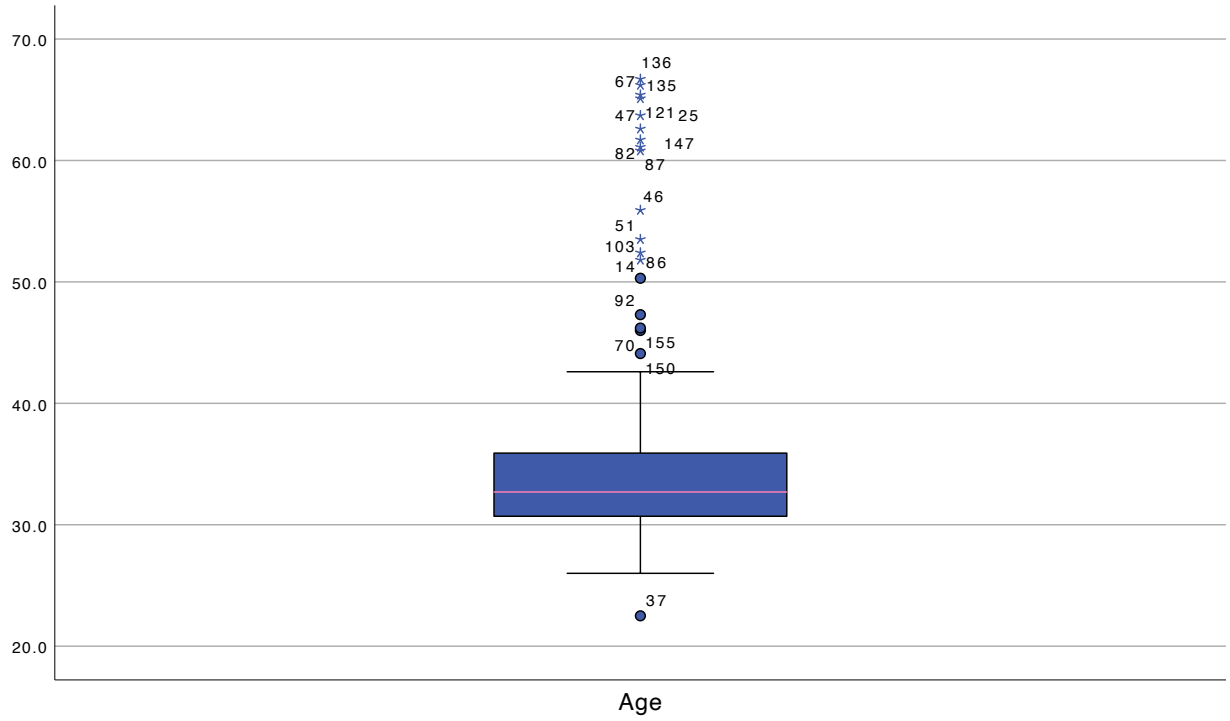

Summarize

Case Processing Summary[a]

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Name	15	100.0%	0	0.0%	15	100.0%
Salary	15	100.0%	0	0.0%	15	100.0%

a. Limited to first 100 cases.

Case Summaries[a]

		Name	Salary
1		Gunar Cockshoot	$31,400
2		Kaine Padly	$33,000
3		Husein Augar	$28,900
4		Marney O'Breen	$32,900
5		Mallorie Waber	$32,600
6		Camilla Castle	$32,500
7		Orton Livick	$31,100
8		Valentia Etteridge	$31,900
9		Virginia McConville	$29,700
10		Myer McCory	$34,900
11		Allene Gobbet	$29,000
12		Bev Lashley	$33,600
13		Advait Kumar	$33,100
14		Lindt Truffle	$33,800
15		Advait Kapoor	$32,600
Total	N	15	15

a. Limited to first 100 cases.

Frequencies

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[DataSet1] /Users/yusufsusin/Desktop/spss 213 ödev/ödev.sav
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Statistics

Education Qualification

N	Valid	161
	Missing	0

Education Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's Degree	49	30.4	30.4	30.4
	Diploma	41	25.5	25.5	55.9
	High School Diploma	42	26.1	26.1	82.0
	Master's Degree	29	18.0	18.0	100.0
	Total	161	100.0	100.0	

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Education Qualification * Gender	161	100.0%	0	0.0%	161	100.0%

Education Qualification * Gender Crosstabulation

			Gender	
			Female	Male
Education Qualification	Bachelor's Degree	Count	21	28
		% within Education Qualification	42.9%	57.1%
		% within Gender	23.9%	38.4%
	Diploma	Count	29	12
		% within Education Qualification	70.7%	29.3%
		% within Gender	33.0%	16.4%
	High School Diploma	Count	27	15
		% within Education Qualification	64.3%	35.7%
		% within Gender	30.7%	20.5%
	Master's Degree	Count	11	18
		% within Education Qualification	37.9%	62.1%
		% within Gender	12.5%	24.7%
Total		Count	88	73
		% within Education Qualification	54.7%	45.3%
		% within Gender	100.0%	100.0%

Education Qualification * Gender Crosstabulation

			Total
Education Qualification	Bachelor's Degree	Count	49
		% within Education Qualification	100.0%
		% within Gender	30.4%
	Diploma	Count	41
		% within Education Qualification	100.0%
		% within Gender	25.5%
	High School Diploma	Count	42
		% within Education Qualification	100.0%
		% within Gender	26.1%
	Master's Degree	Count	29
		% within Education Qualification	100.0%
		% within Gender	18.0%
Total		Count	161
		% within Education Qualification	100.0%
		% within Gender	100.0%

Explore

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Salary	161	100.0%	0	0.0%	161	100.0%
Leave Balance	161	100.0%	0	0.0%	161	100.0%

Descriptives

			Statistic	Std. Error
Salary	Mean		$54,231.06	$1,311.069
	95% Confidence Interval for Mean	Lower Bound	$51,641.82	
		Upper Bound	$56,820.29	
	5% Trimmed Mean		$53,881.54	
	Median		$51,100.00	
	Variance		276743280	
	Std. Deviation		$16,635.603	
	Minimum		$28,900	
	Maximum		$85,000	
	Range		$56,100	
	Interquartile Range		$31,250	
	Skewness		.432	.191
	Kurtosis		-1.088	.380
Leave Balance	Mean		16.42	.393
	95% Confidence Interval for Mean	Lower Bound	15.64	
		Upper Bound	17.19	
	5% Trimmed Mean		16.43	
	Median		16.00	
	Variance		24.807	
	Std. Deviation		4.981	
	Minimum		2	
	Maximum		37	
	Range		35	
	Interquartile Range		6	
	Skewness		.156	.191
	Kurtosis		1.638	.380

Percentiles

		Percentiles			
		5	10	25	50
Weighted Average (Definition 1)	Salary	$32,600.00	$35,120.00	$39,700.00	$51,100.00
	Leave Balance	8.00	10.00	14.00	16.00
Tukey's Hinges	Salary			$39,700.00	$51,100.00
	Leave Balance			14.00	16.00

Percentiles

		Percentiles		
		75	90	95
Weighted Average (Definition 1)	Salary	$70,950.00	$80,420.00	$82,790.00
	Leave Balance	20.00	23.00	24.00
Tukey's Hinges	Salary	$70,800.00		
	Leave Balance	20.00		

Salary

```
Salary Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

     3.00        2 .  899
    12.00        3 .  111222233334
    27.00        3 .  555566666666677777788889999
    16.00        4 .  1111222333344444
    19.00        4 .  5555666667778899999
    17.00        5 .  11111111122222334
    15.00        5 .  556677778888899
    11.00        6 .  00111122333
      .00        6 .
    10.00        7 .  0133344444
    15.00        7 .  666667777788899
    15.00        8 .  011122222233344
     1.00        8 .  5

 Stem width:  10000
 Each leaf:        1 case(s)
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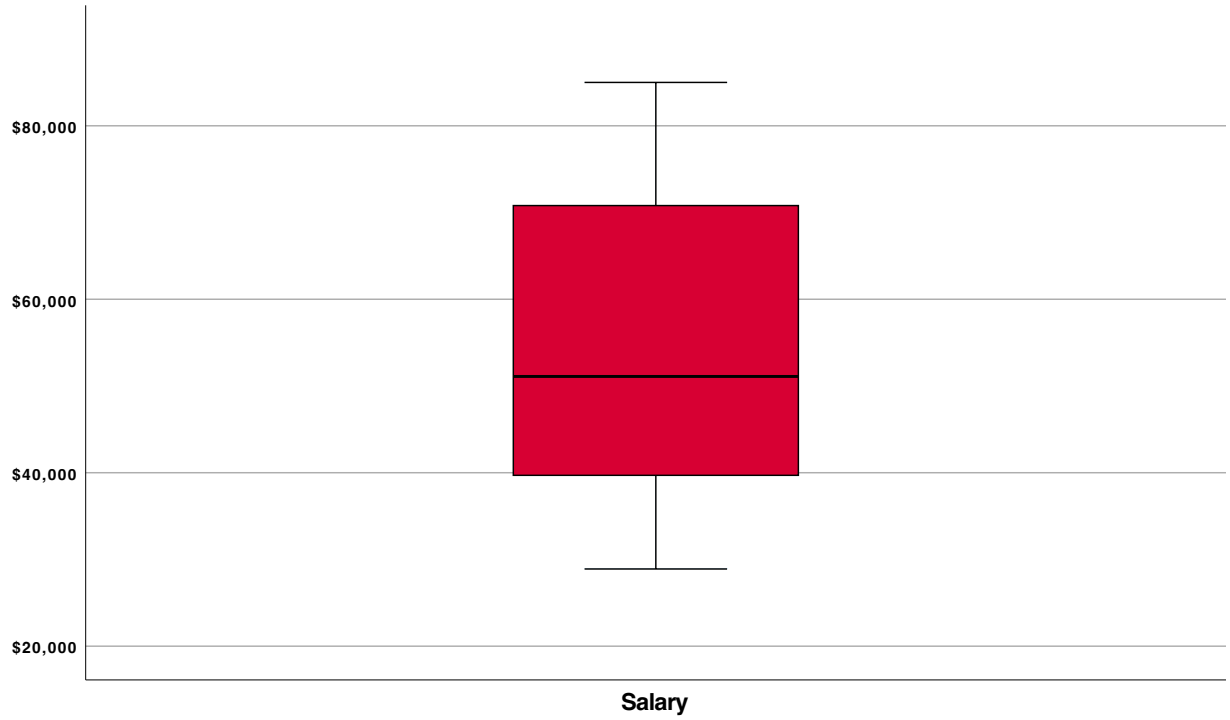

Leave Balance

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Leave Balance Stem-and-Leaf Plot

 Frequency    Stem &  Leaf
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```
    2.00 Extremes    (=<4)
    1.00        0 .  5
    3.00        0 .  666
    9.00        0 .  888899999
    8.00        1 .  00000111
   13.00        1 .  2222223333333
   26.00        1 .  44444444444455555555555555
   37.00        1 .  66666666666666666666667777777777777777
   21.00        1 .  888888888888889999999
   18.00        2 .  000000000000111111
   14.00        2 .  22222233333333
    6.00        2 .  444455
    1.00        2 .  7
    2.00 Extremes    (>=30)

Stem width:  10
Each leaf:        1 case(s)
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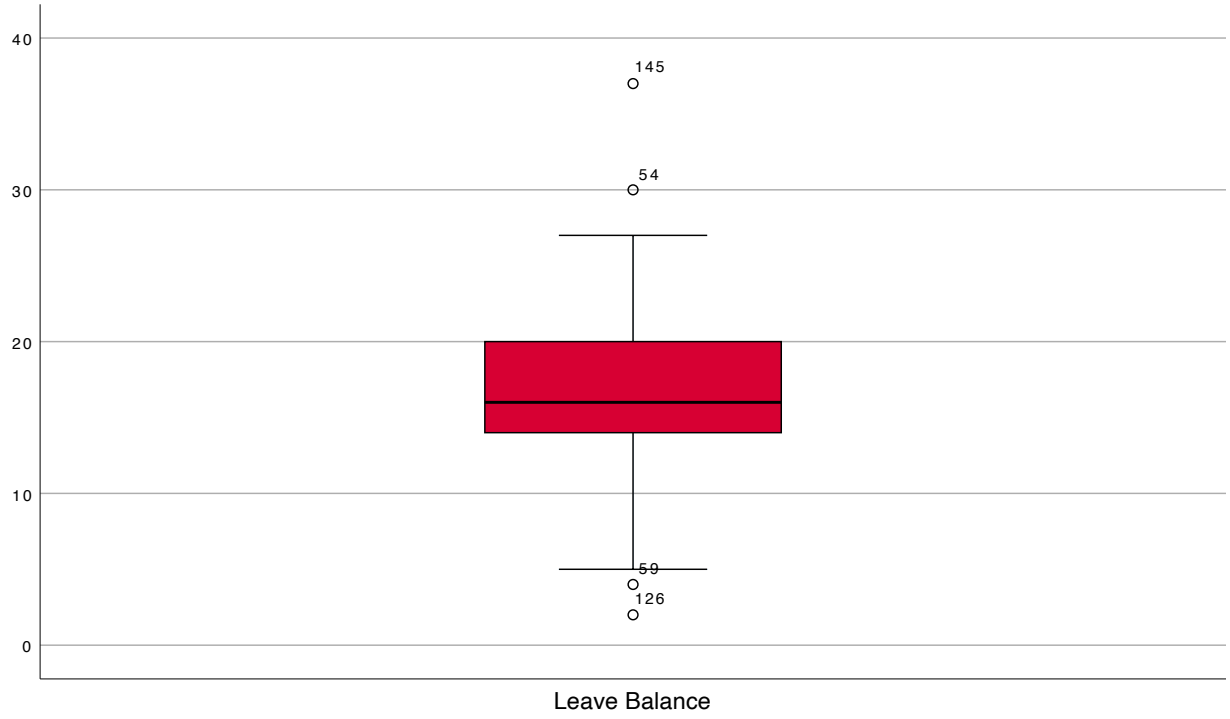
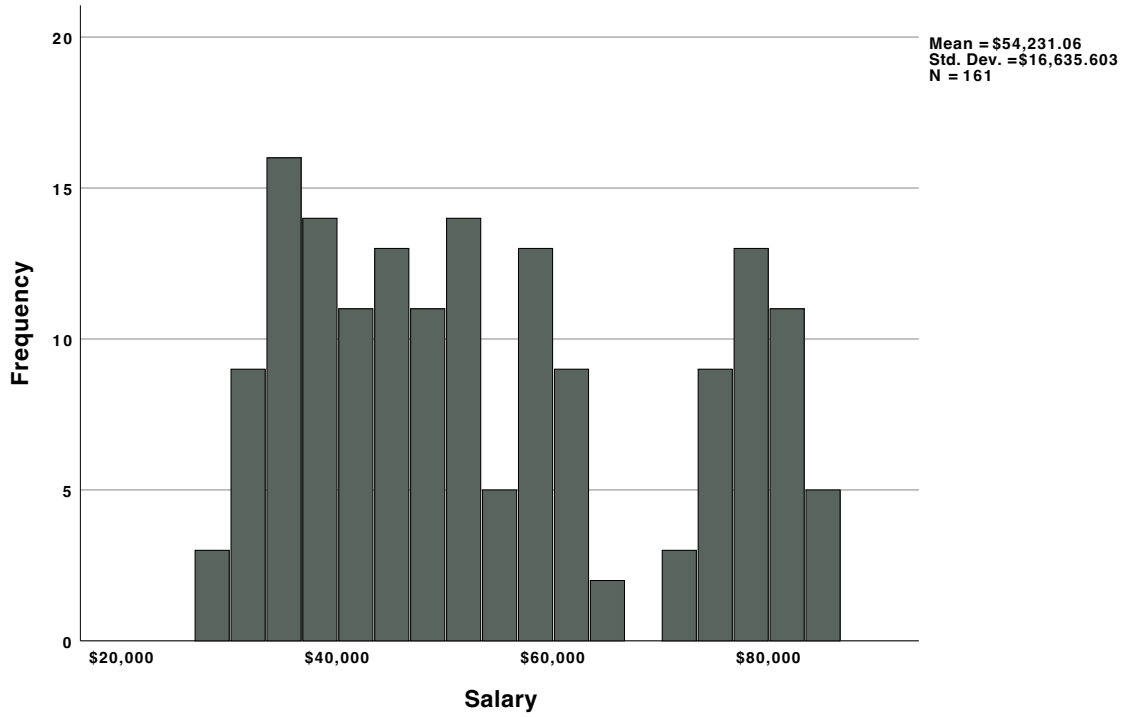


Frequencies

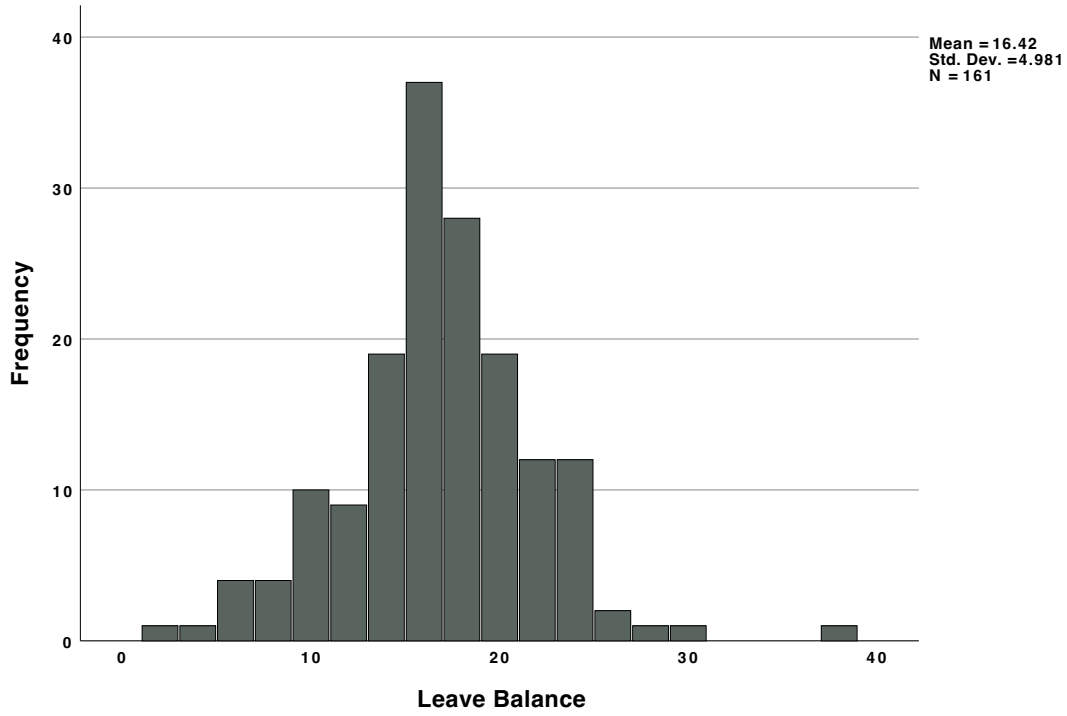
Statistics

		Salary	Leave Balance
N	Valid	161	161
	Missing	0	0
Percentiles	25	$39,700.00	14.00
	30	$42,640.00	14.60
	50	$51,100.00	16.00
	75	$70,950.00	20.00
	80	$74,860.00	20.00

Graph



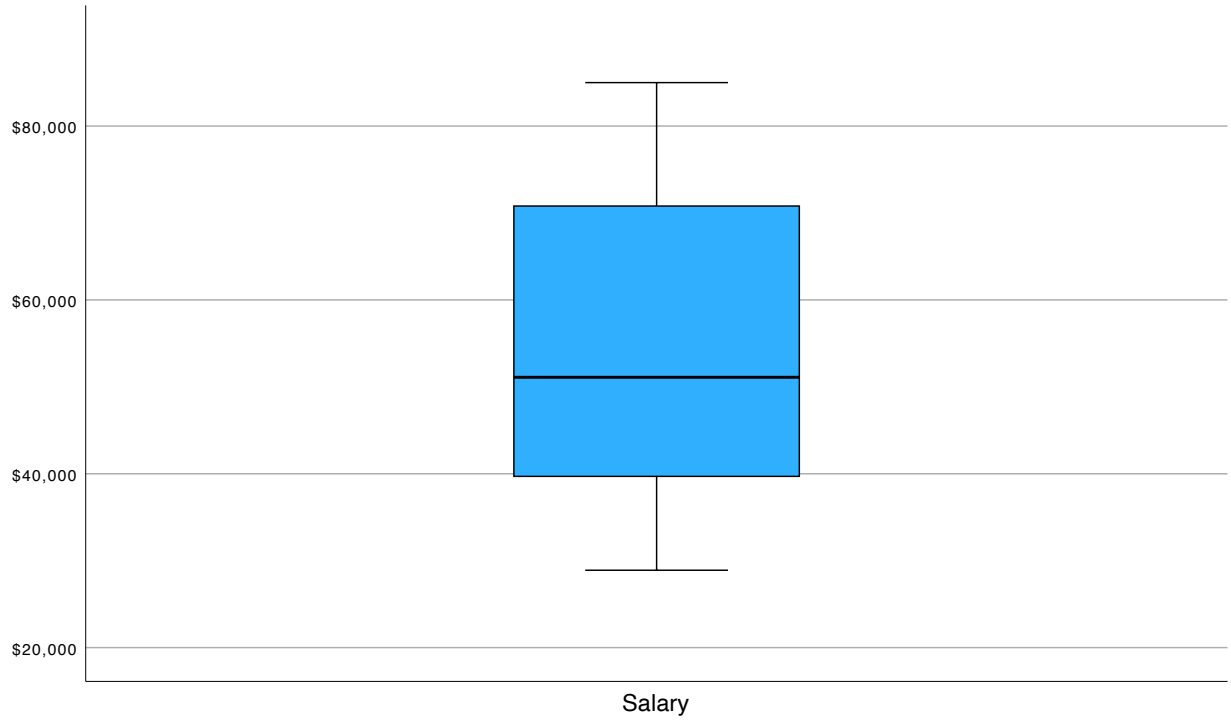
Graph



Explore

Case Processing Summary

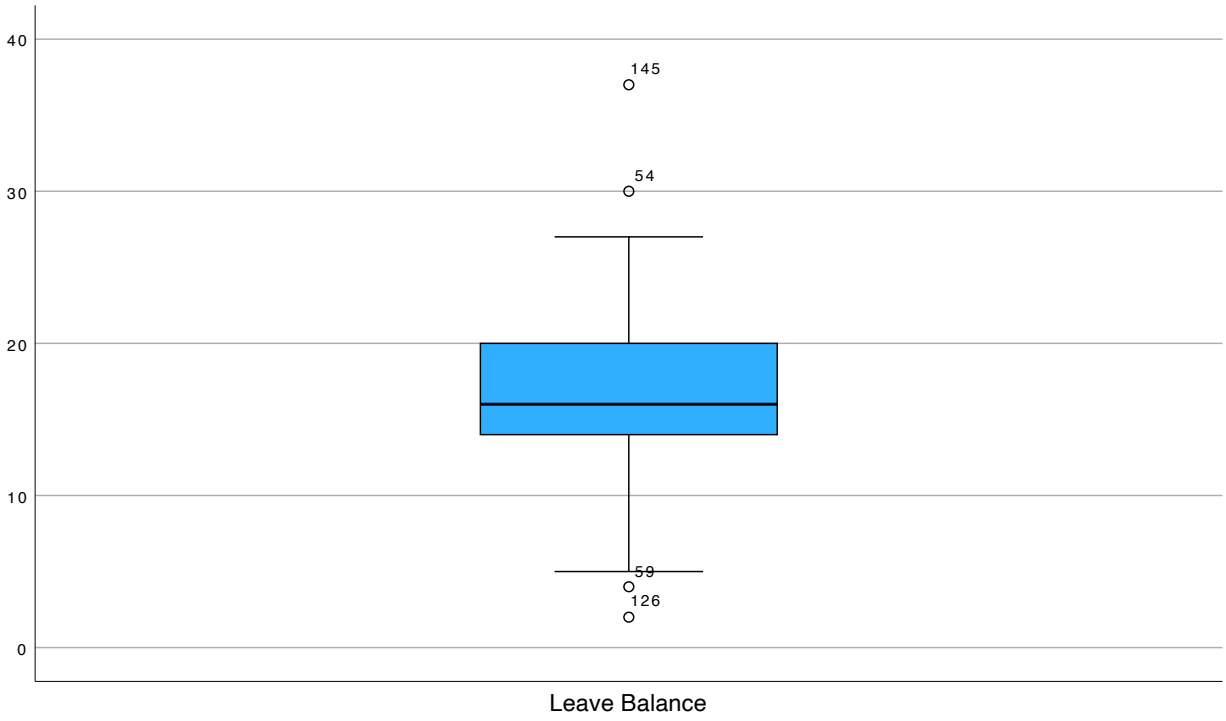
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Salary	161	100.0%	0	0.0%	161	100.0%



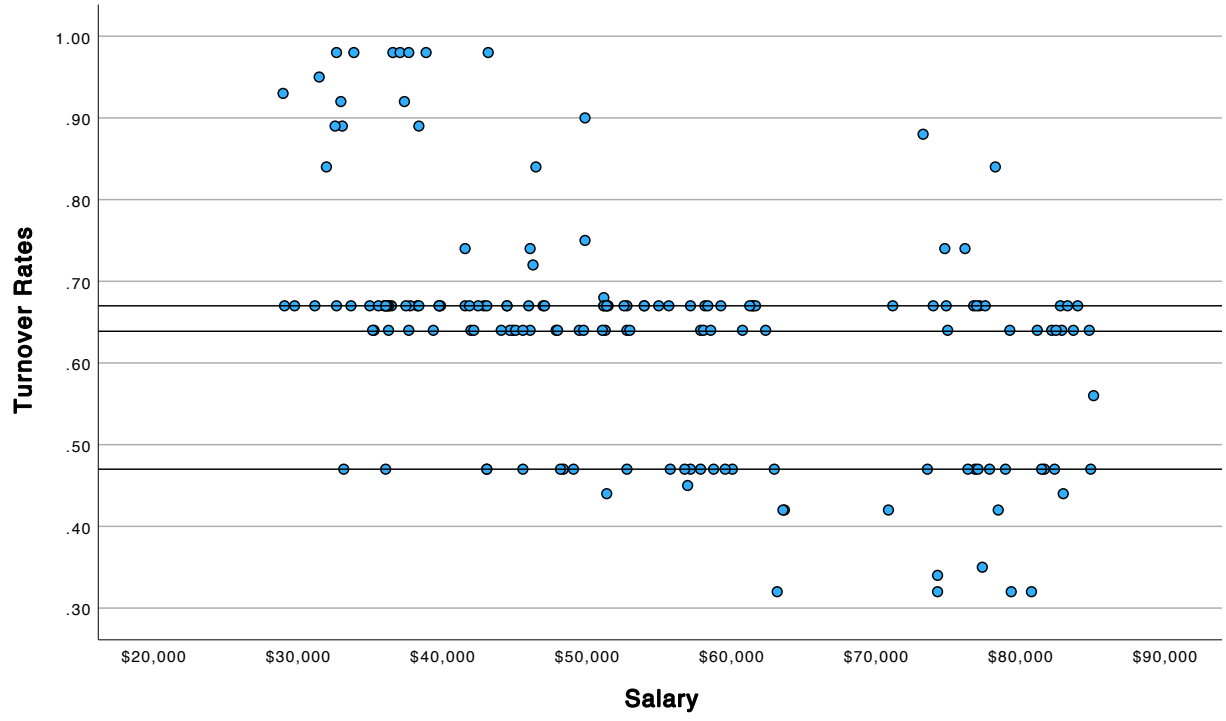
Explore

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Leave Balance	161	100.0%	0	0.0%	161	100.0%



Graph



Correlations

Correlations

		Salary	Turnover Rates
Salary	Pearson Correlation	1	-.458**
	Sig. (2-tailed)		<.001
	Sum of Squares and Cross-products	4.428E+10	-176963.099
	Covariance	276743280	-1106.019
	N	161	161
Turnover Rates	Pearson Correlation	-.458**	1
	Sig. (2-tailed)	<.001	
	Sum of Squares and Cross-products	-176963.099	3.373
	Covariance	-1106.019	.021
	N	161	161

**. Correlation is significant at the 0.01 level (2-tailed).