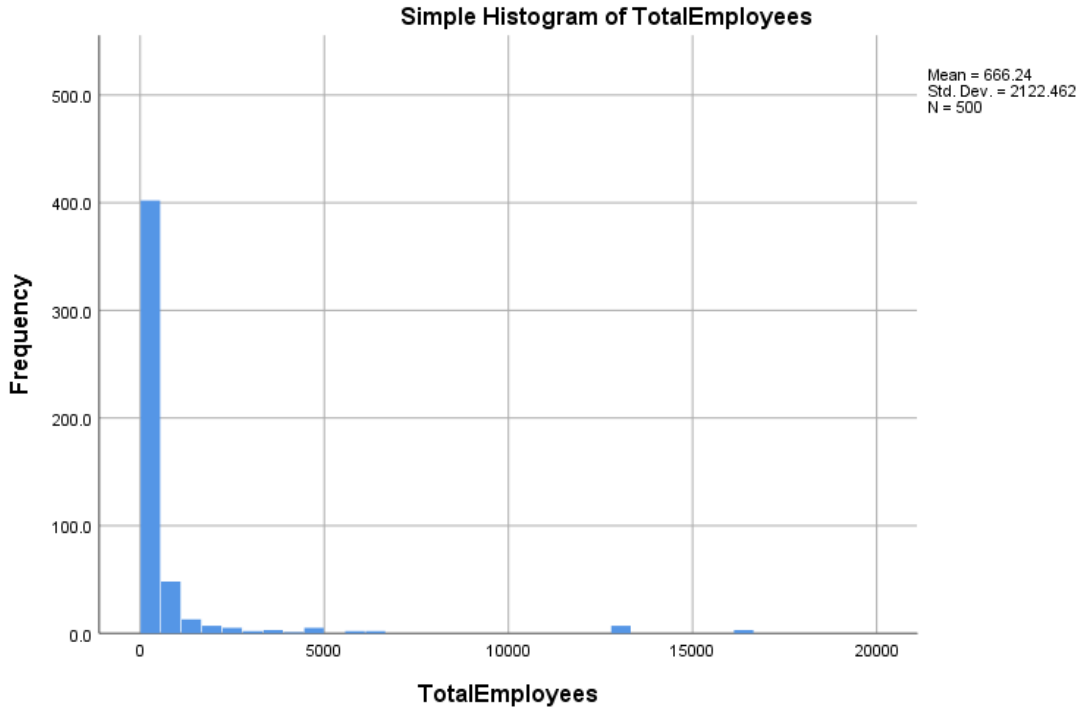
(i) Total Employees



Descriptive Statistics

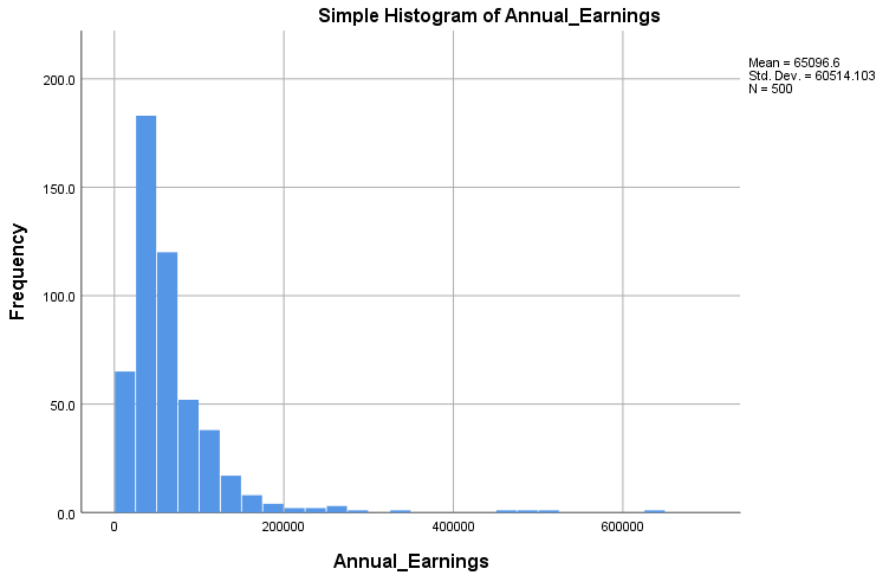
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
TotalEmployees	500	16603	3	16606	666.24	2122.462	4504845.178
Valid N (listwise)	500						

Case Summaries

TotalEmployees

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	666.24	84.50	94.919	3	16606	16603	2122.462	4504845.178	5.546	100.0%	100.0%

Annual Earnings



Descriptive Statistics

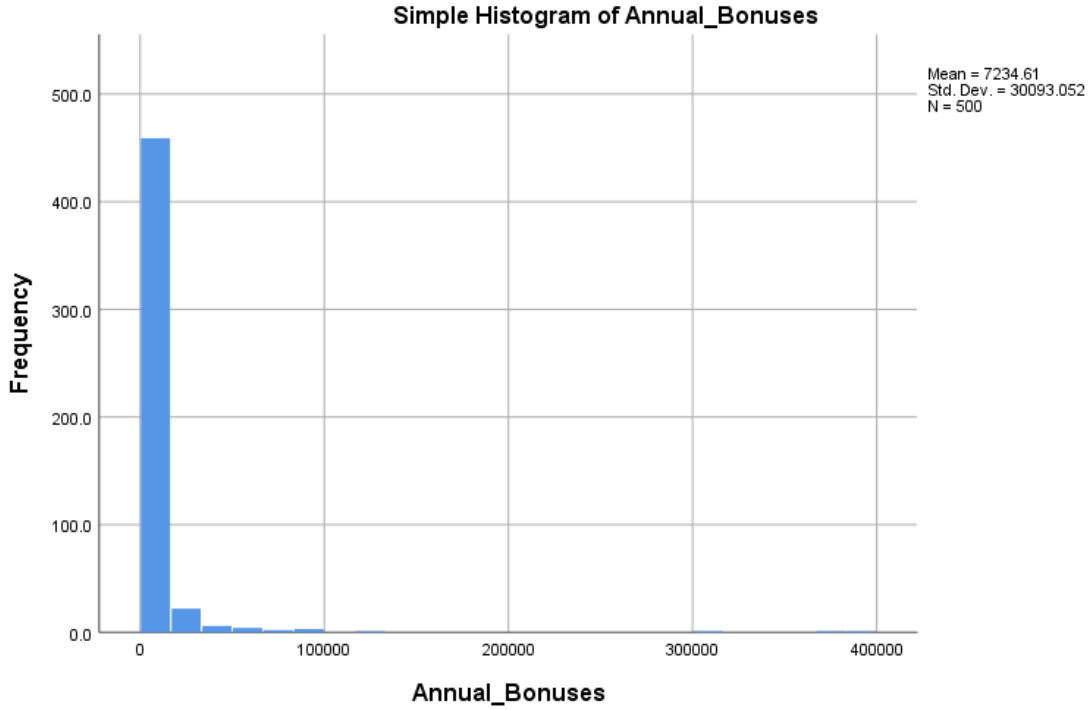
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Annual_Earnings	500	631274	1505	632779	65096.60	60514.103	3661956708.000
Valid N (listwise)	500						

Case Summaries

Annual_Earnings

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	65096.60	50073.00	2706.273	1505	632779	631274	60514.103	3661956708.000	4.431	100.0%	100.0%

Annual Bonuses



Descriptive Statistics

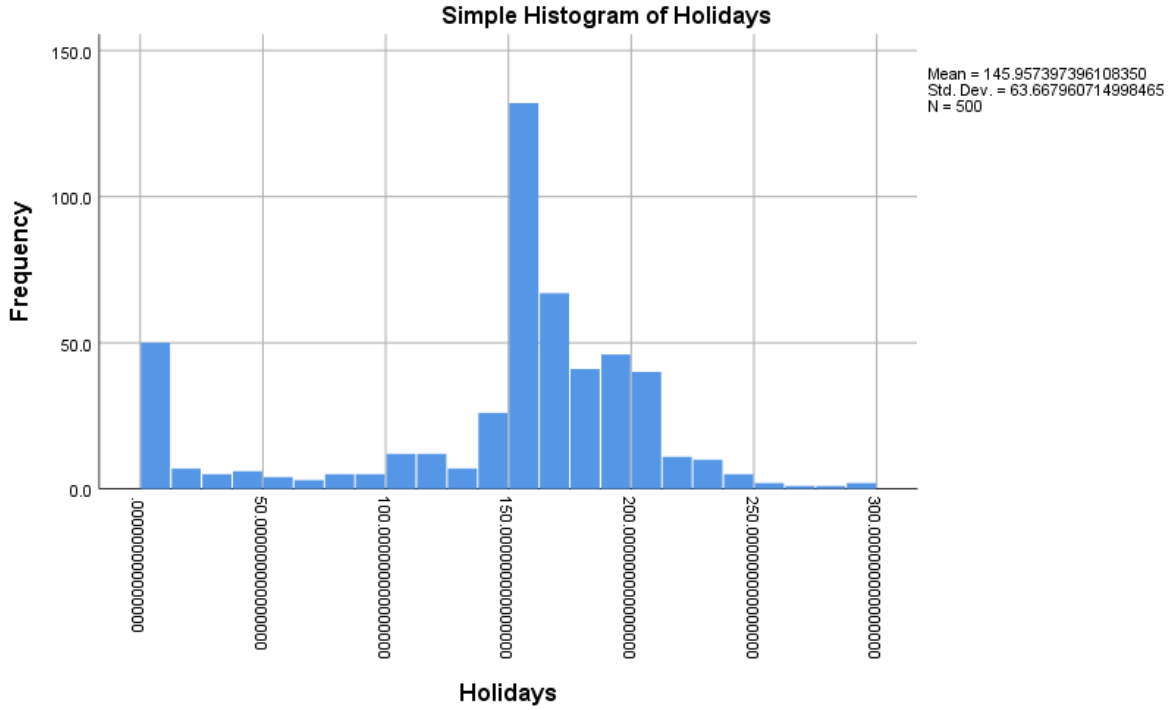
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Annual_Bonuses	500	389000	0	389000	7234.61	30093.052	905591778.491
Valid N (listwise)	500						

Case Summaries

Annual_Bonuses

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	7234.61	.00	1345.802	0	389000	389000	30093.052	905591778.491	9.999	100.0%	100.0%

Holidays



Descriptive Statistics

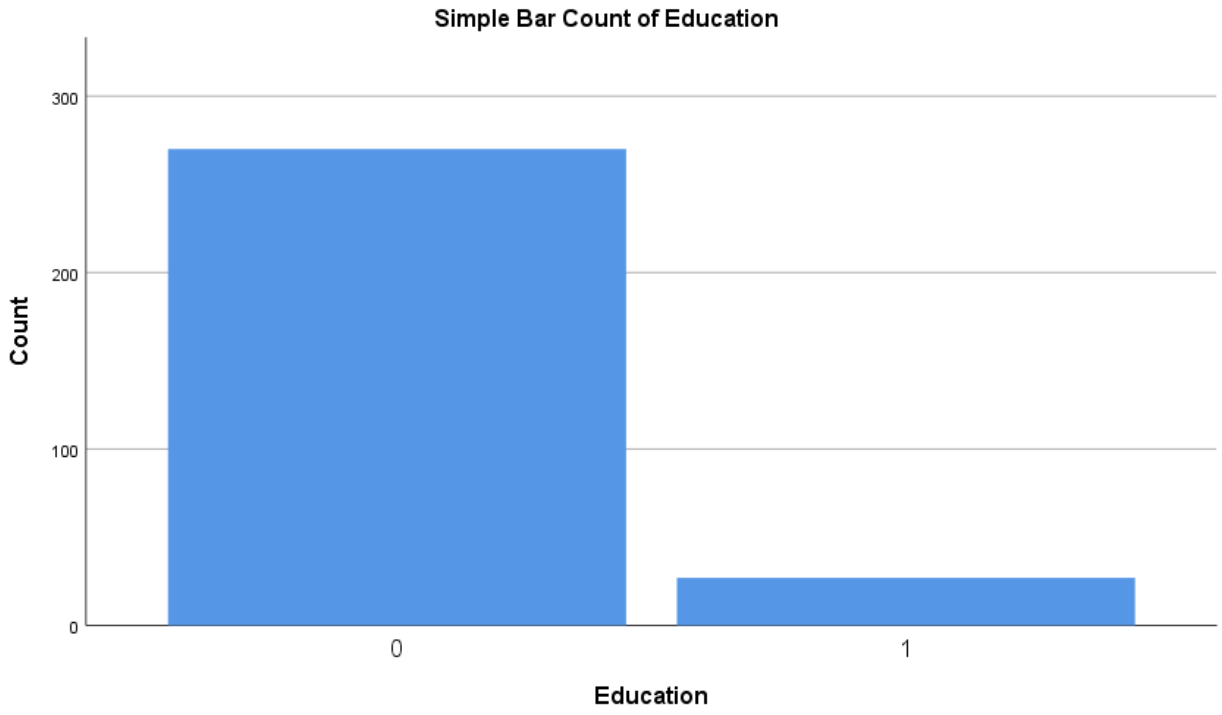
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Holidays	500	291.000000000000000	.000000000000000	291.000000000000000	145.957397396108350	63.667960714998460	4053.609
Valid N (listwise)	500						

Case Summaries

Holidays

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness
500	145.957397396108350	160.000000000000000	2.847317762950453	.000000000000000	291.000000000000000	291.000000000000000	63.667960714998460	4053.609	-1.160

Education



Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Education	297	1	0	1	.09	.288	.083
Valid N (listwise)	297						

Case Processing Summary

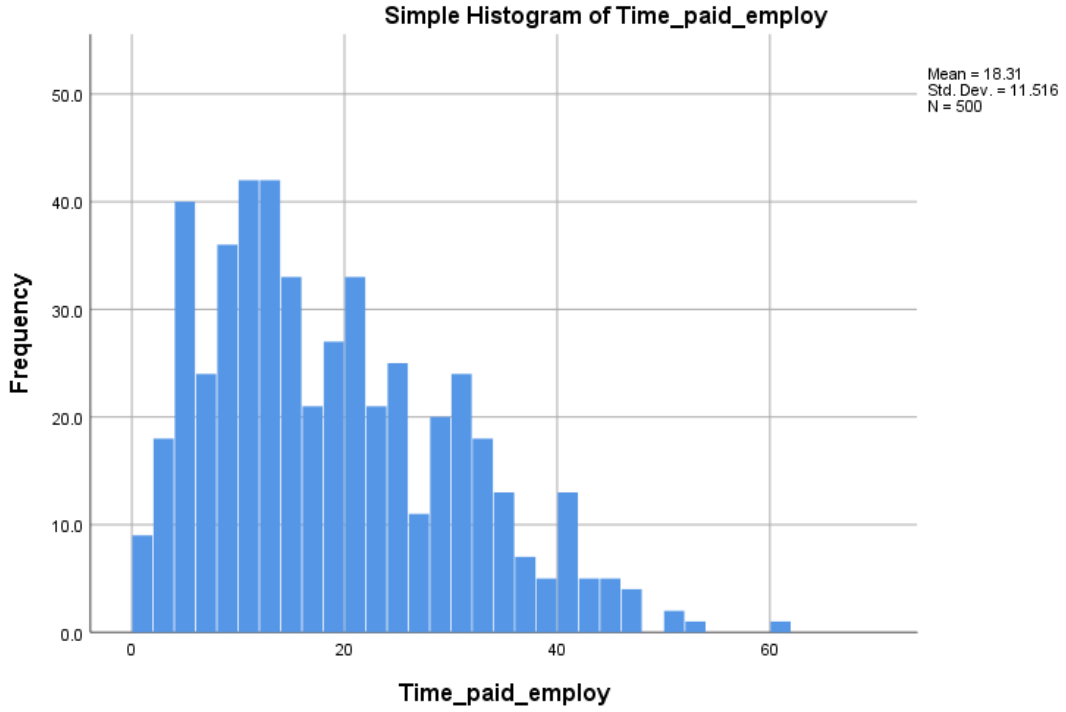
	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Education	297	59.4%	203	40.6%	500	100.0%

Case Summaries

Education

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
297	.09	.00	.017	0	1	1	.288	.083	2.861	100.0%	100.0%

Time paid employed



Descriptive Statistics

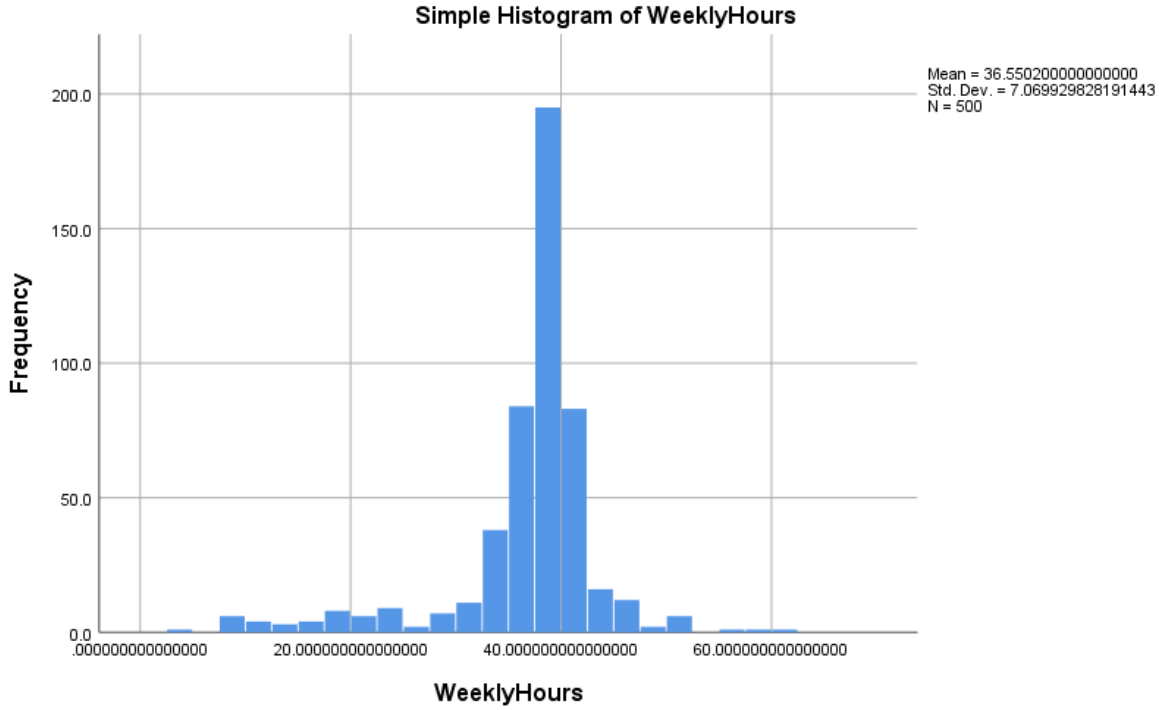
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Time_paid_employ	500	59	1	60	18.31	11.516	132.626
Valid N (listwise)	500						

Case Summaries

Time_paid_employ

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	18.31	16.00	.515	1	60	59	11.516	132.626	.658	100.0%	100.0%

Weekly Hours



Descriptive Statistics

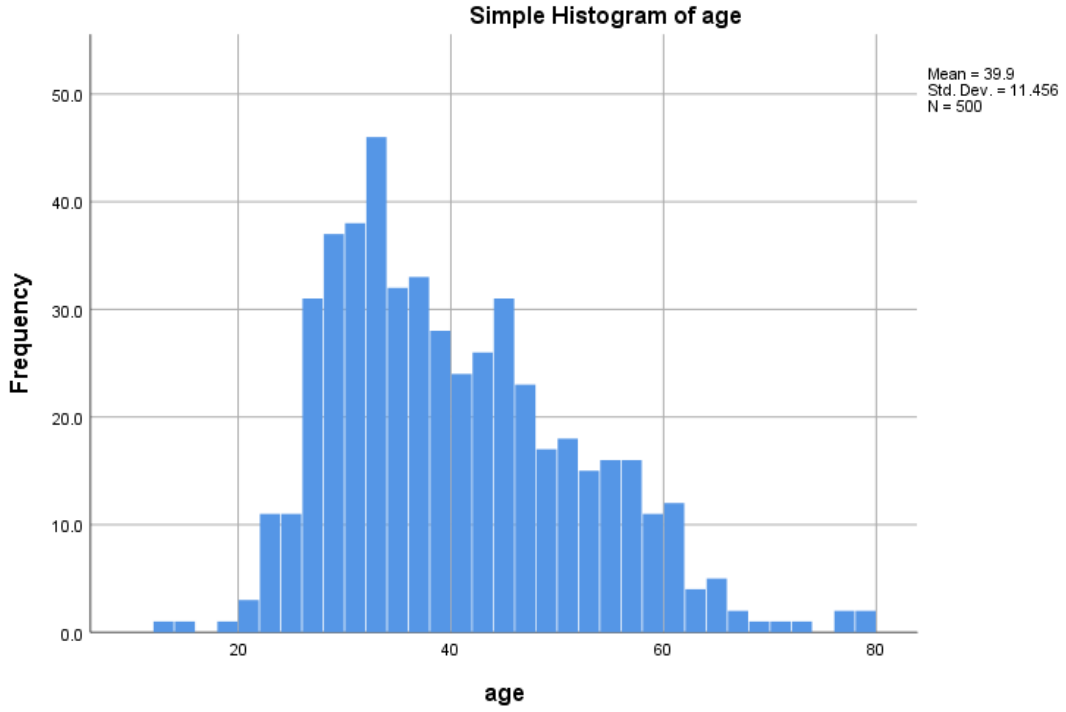
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
WeeklyHours	500	56.100000000000000	3.900000000000000	60.000000000000000	36.550200000000000	7.069929828191442	49.984
Valid N (listwise)	500						

Case Summaries

WeeklyHours

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	36.550200000000000	38.100000000000000	.31617687383978900	3.900000000000000	60.000000000000000	56.100000000000000	7.069929828191442	49.984	-1.831	100.0%	100.0%

Age



Descriptive Statistics

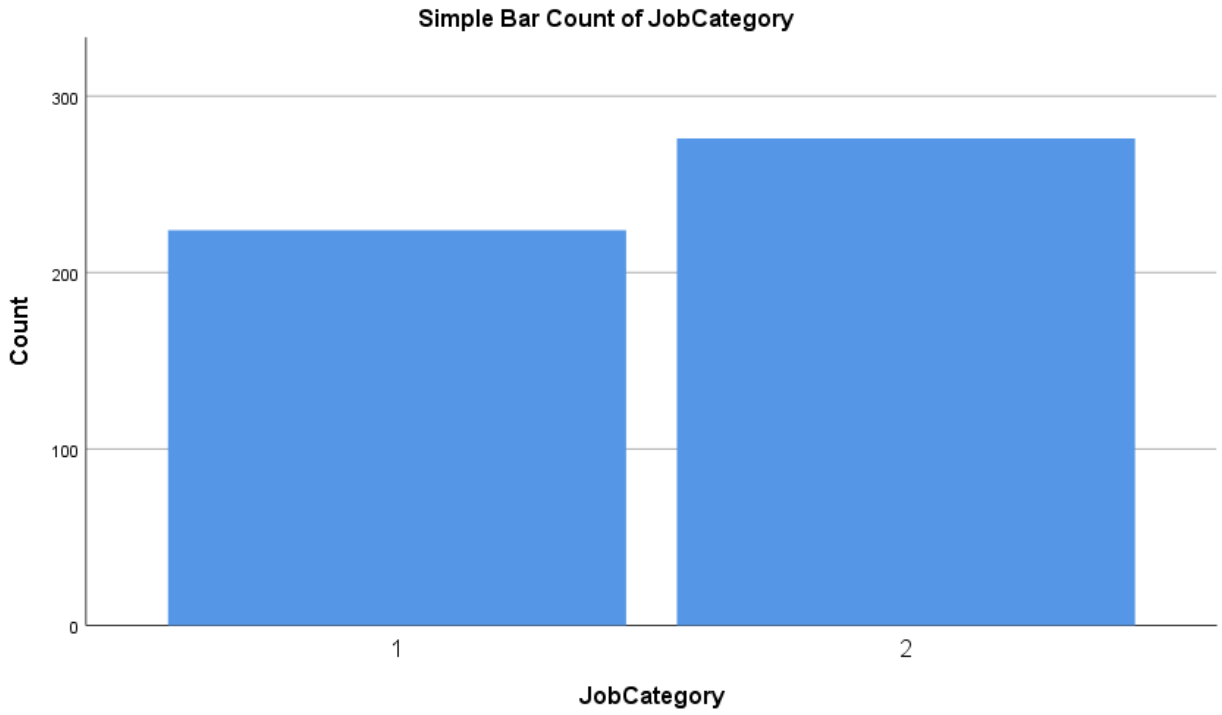
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
age	500	65	13	78	39.90	11.456	131.233
Valid N (listwise)	500						

Case Summaries

age

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	39.90	38.00	.512	13	78	65	11.456	131.233	.621	100.0%	100.0%

Job Category



Descriptive Statistics

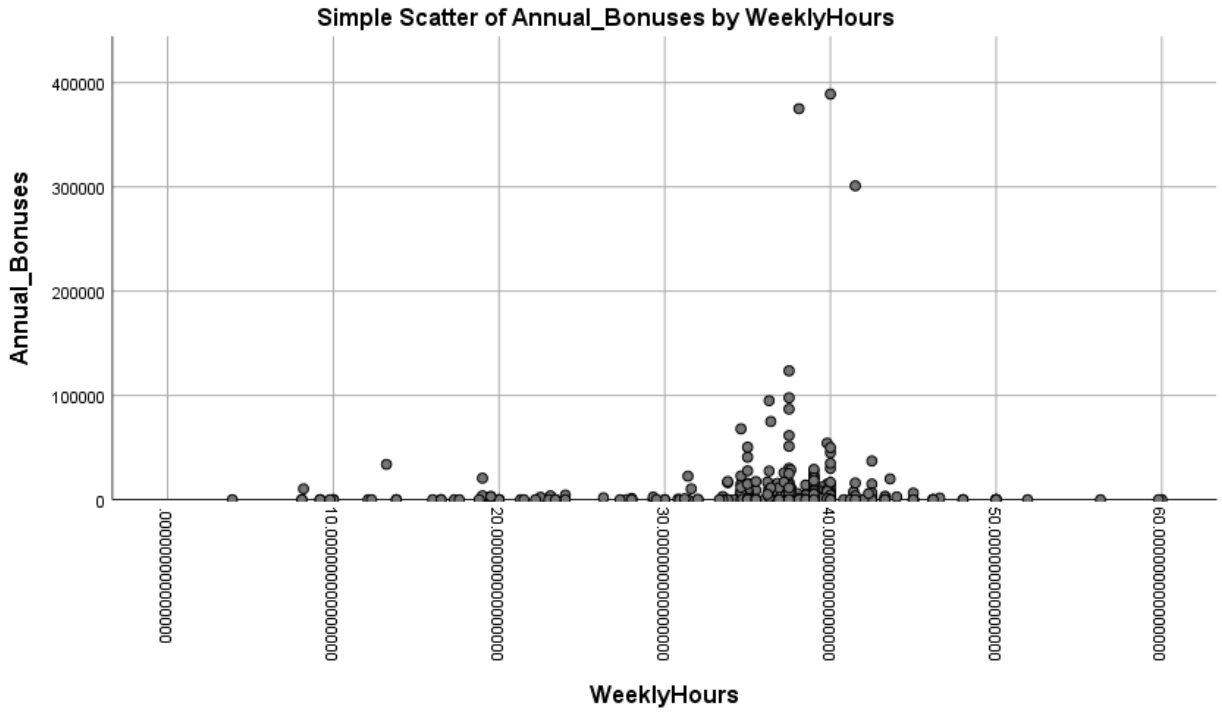
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
JobCategory	500	1	1	2	1.55	.498	.248
Valid N (listwise)	500						

Case Summaries

JobCategory

N	Mean	Median	Std. Error of Mean	Minimum	Maximum	Range	Std. Deviation	Variance	Skewness	% of Total Sum	% of Total N
500	1.55	2.00	.022	1	2	1	.498	.248	-.210	100.0%	100.0%

(ii) Correlation between hours worked and annual bonuses received



Correlations

		Annual_Bonuses	WeeklyHours
Annual_Bonuses	Pearson Correlation	1	.041
	Sig. (2-tailed)		.366
	N	500	500
WeeklyHours	Pearson Correlation	.041	1
	Sig. (2-tailed)	.366	
	N	500	500

Correlation between hours worked and annual bonuses is, r=.041

P- value = .366, p > .05 .366 > .05

Sample suggests there is ***not*** a statistically significant relationship between hours worked and annual bonuses received

(iii) Test whether there is Evidence of a difference in annual earnings between the management and professional job categories.

Ho: u1 = u2 (means are the same)

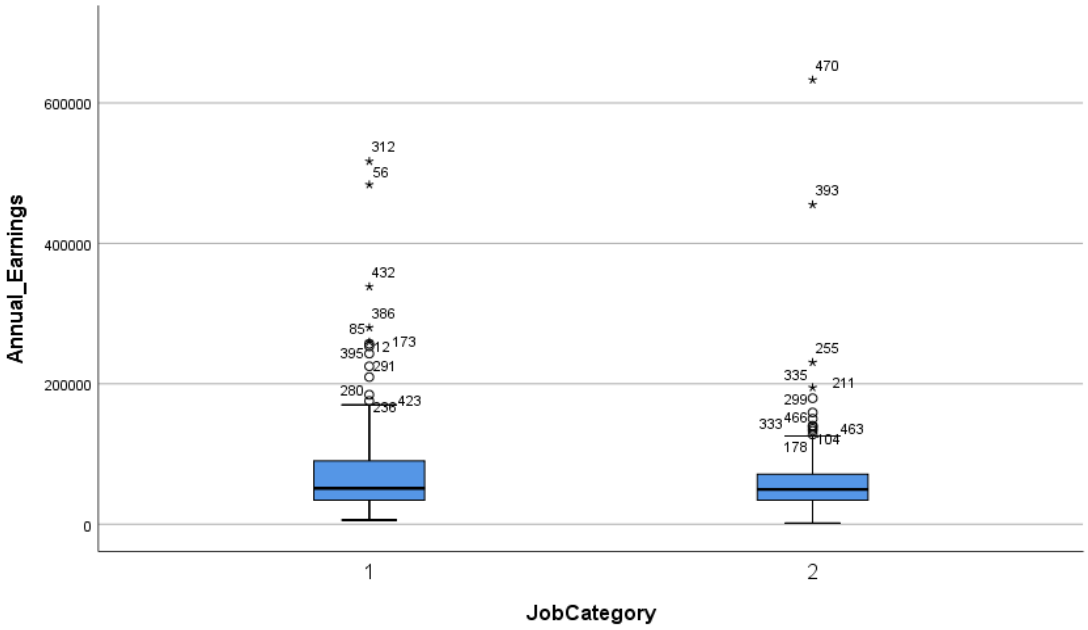
Ha: u1 ≠ u2 (means differ)

Descriptives

	JobCategory			Statistic	Std. Error
Annual_Earnings	1	Mean		72993.43	4501.023
		95% Confidence Interval for Mean	Lower Bound	64123.45	
			Upper Bound	81863.41	
		5% Trimmed Mean		64216.44	
		Median		51023.00	
		Variance		4538062235.161	
		Std. Deviation		67365.141	
		Minimum		6000	
		Maximum		516839	
		Range		510839	
		Interquartile Range		56249	
		Skewness		3.186	.163
		Kurtosis		14.976	.324
	2	Mean		58687.58	3226.257
		95% Confidence Interval for Mean	Lower Bound	52336.28	
			Upper Bound	65038.88	
		5% Trimmed Mean		53168.47	
		Median		49430.00	
		Variance		2872810992.616	
		Std. Deviation		53598.610	
		Minimum		1505	
		Maximum		632779	
		Range		631274	
		Interquartile Range		36973	
		Skewness		6.278	.147
		Kurtosis		57.965	.292

Group Statistics

	JobCategory	N	Mean	Std. Deviation	Std. Error Mean
Annual_Earnings	1	224	72993.43	67365.141	4501.023
	2	276	58687.58	53598.610	3226.257



Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Annual_Earnings	Equal variances assumed	13.563	.000	2.644	498	.008	14305.857	5409.666	3677.274	24934.439
	Equal variances not assumed			2.583	420.912	.010	14305.857	5537.864	3420.542	25191.172

From Levene's test for equality of variances, our p-value < .001 < .05
This tells us there is a statistically **significant** difference between the variances, and we must use values from the above table's second row, where equal variances are not assumed.

Test Statistic: 2.583
P-value: .010

Since p < .05, there is evidence to suggest that there is a statistically **significant** difference between the means

Conclusion: Reject Ho and fail to reject Ha. There is evidence to suggest that the difference between the means of annual earnings for management and professional jobs is statistically **significant.**

The evidence from the sample would suggest that the means for annual earnings of management jobs are higher than that of professional job categories.

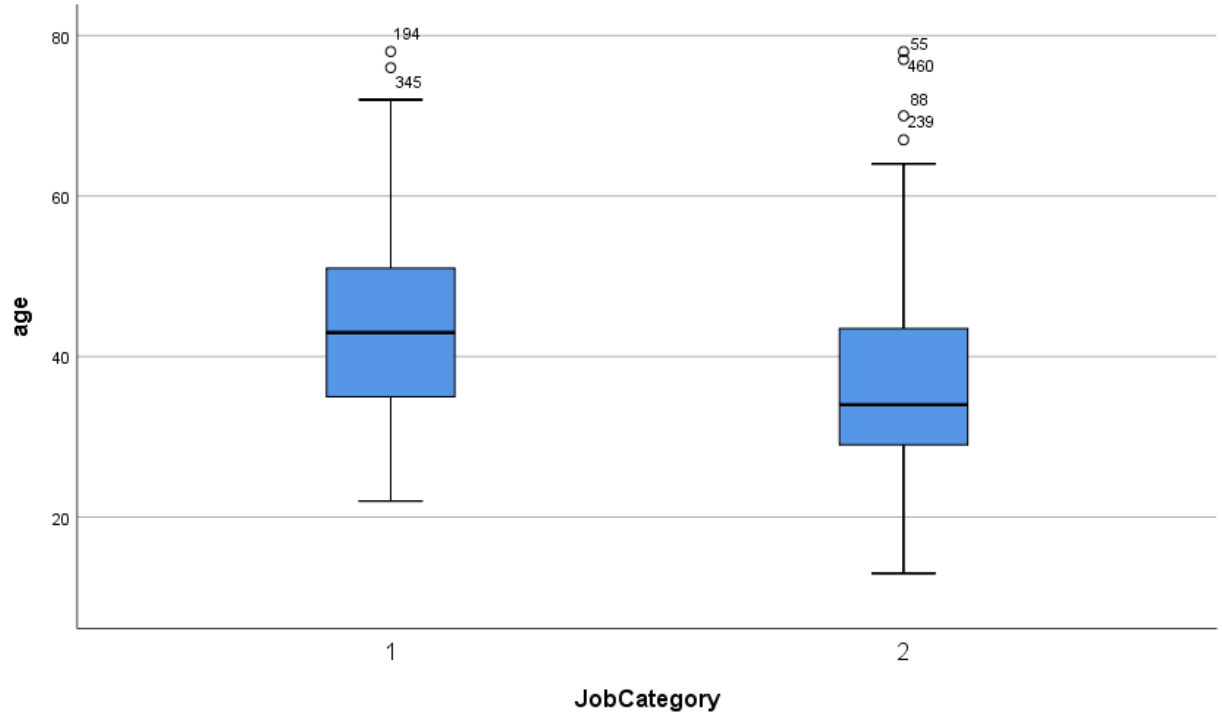
(iv) Test whether there is evidence of a difference in employee ages between the management and professional job categories.

Ho: u1 = u2 (means are the same)

Ha: u1 ≠ u2 (means differ)

Descriptives

	JobCategory			Statistic	Std. Error
age	1	Mean		43.63	.730
		95% Confidence Interval for Mean	Lower Bound	42.19	
			Upper Bound	45.07	
		5% Trimmed Mean		43.30	
		Median		43.00	
		Variance		119.391	
		Std. Deviation		10.927	
		Minimum		22	
		Maximum		78	
		Range		56	
		Interquartile Range		16	
		Skewness		.407	.163
		Kurtosis		-.258	.324
	2	Mean		36.88	.662
		95% Confidence Interval for Mean	Lower Bound	35.58	
			Upper Bound	38.18	
		5% Trimmed Mean		36.25	
		Median		34.00	
		Variance		120.833	
		Std. Deviation		10.992	
		Minimum		13	
		Maximum		78	
		Range		65	
		Interquartile Range		15	
		Skewness		.956	.147
		Kurtosis		.863	.292



Group Statistics

	JobCategory	N	Mean	Std. Deviation	Std. Error Mean
age	1	224	43.63	10.927	.730
	2	276	36.88	10.992	.662

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
age	Equal variances assumed	.244	.622	6.846	498	.000	6.749	.986	4.812	8.686
	Equal variances not assumed			6.850	478.180	.000	6.749	.985	4.813	8.685

From Levene's test for equality of variances, our p-value = .622 > .05
This tells us there is **not** a statistically significant difference between the variances, and we can use values from the above table's first row, where equal variances are assumed.

Test Statistic: 6.846
P-value: < .001

Since p < .05, there is evidence to suggest that there is a statistically **significant** difference between the means.

Conclusion: Reject Ho and fail to reject Ha. There is evidence to suggest that the difference between the means of the employee's ages for management and professional jobs is statistically **significant.**

The evidence from the sample would suggest that the means for employee's ages of management jobs are higher than that of professional job categories.

(v) Test whether there is a difference in number of paid holiday's hours between company sizes.

Ho: u1 = u2 = u3 = u4 (no difference between the means of paid holidays between company sizes)

Ha: u1 – u2 – u3 – u4 ≠ 0 (there is a difference between the means of paid holidays between company sizes, i.e. at least 2 means differed)

Descriptives

Holidays

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	70	139.1428571428571400	56.796811942140636	6.788517455223183	125.600135370186850	152.685578915527430	.000000000000000	240.000000000000000
2.00	143	152.6573426506923000	52.074010834523070	4.354647548939259	144.049027502554760	161.265657798829840	.000000000000000	283.500000000000000
3.00	129	148.3852706361317600	61.975038004846340	5.456597838093194	137.588459554611000	159.182081717652520	.000000000000000	258.000000000000000
4.00	158	140.9303720692677000	76.092666452573250	6.053607506869886	128.973352124182000	152.887392014353400	.000000000000000	291.000000000000000
Total	500	145.9573973961086000	63.667960714998436	2.847317762950452	140.363188501760000	151.551606290457220	.000000000000000	291.000000000000000

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Holidays	Based on Mean	9.660	3	496	.000
	Based on Median	5.249	3	496	.001
	Based on Median and with adjusted df	5.249	3	462.499	.001
	Based on trimmed mean	9.560	3	496	.000

ANOVA

Holidays

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14423.037	3	4807.679	1.187	.314
Within Groups	2008327.965	496	4049.048		
Total	2022751.002	499			

Robust Tests of Equality of Means

Holidays

	Statistic[a]	df1	df2	Sig.
Welch	1.358	3	234.581	.256

a. Asymptotically F distributed.

From test of homogeneity of variances, our p-value < .001, p < .05
This tells us there is a statistically **significant** difference between the variances, and we must use Welch's test in the ANOVA.

Test Statistic: 1.358
P-value: .256

Since p > .05 this evidence would suggest that there is **not** a statistically significant difference between the means of number of holiday hours paid between the company sizes.

Conclusion: Fail to reject Ho. There is not enough evidence to reject Ho. Evidence from sample would suggest that there is no difference in the mean number in paid holidays hours between the company sizes.

(vi) Test whether there an association between company size and whether or not the employee received a bonus.

Ho: There is **no association** between company size and receiving bonuses
Ha: There **is an association** between company size and receiving bonuses

CompanySize * BonusRecieved Crosstabulation

			BonusRecieved		
			No bonus	Recived bonus	Total
CompanySize	1.00	Count	61	9	70
		% within CompanySize	87.1%	12.9%	100.0%
		% within BonusRecieved	22.7%	3.9%	14.0%
		% of Total	12.2%	1.8%	14.0%
	2.00	Count	96	47	143
		% within CompanySize	67.1%	32.9%	100.0%
		% within BonusRecieved	35.7%	20.3%	28.6%
		% of Total	19.2%	9.4%	28.6%
	3.00	Count	64	65	129
		% within CompanySize	49.6%	50.4%	100.0%
		% within BonusRecieved	23.8%	28.1%	25.8%
		% of Total	12.8%	13.0%	25.8%
	4.00	Count	48	110	158
		% within CompanySize	30.4%	69.6%	100.0%
		% within BonusRecieved	17.8%	47.6%	31.6%
		% of Total	9.6%	22.0%	31.6%
Total		Count	269	231	500
		% within CompanySize	53.8%	46.2%	100.0%
		% within BonusRecieved	100.0%	100.0%	100.0%
		% of Total	53.8%	46.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	77.314[a]	3	.000
Likelihood Ratio	82.576	3	.000
Linear-by-Linear Association	77.109	1	.000
N of Valid Cases	500		

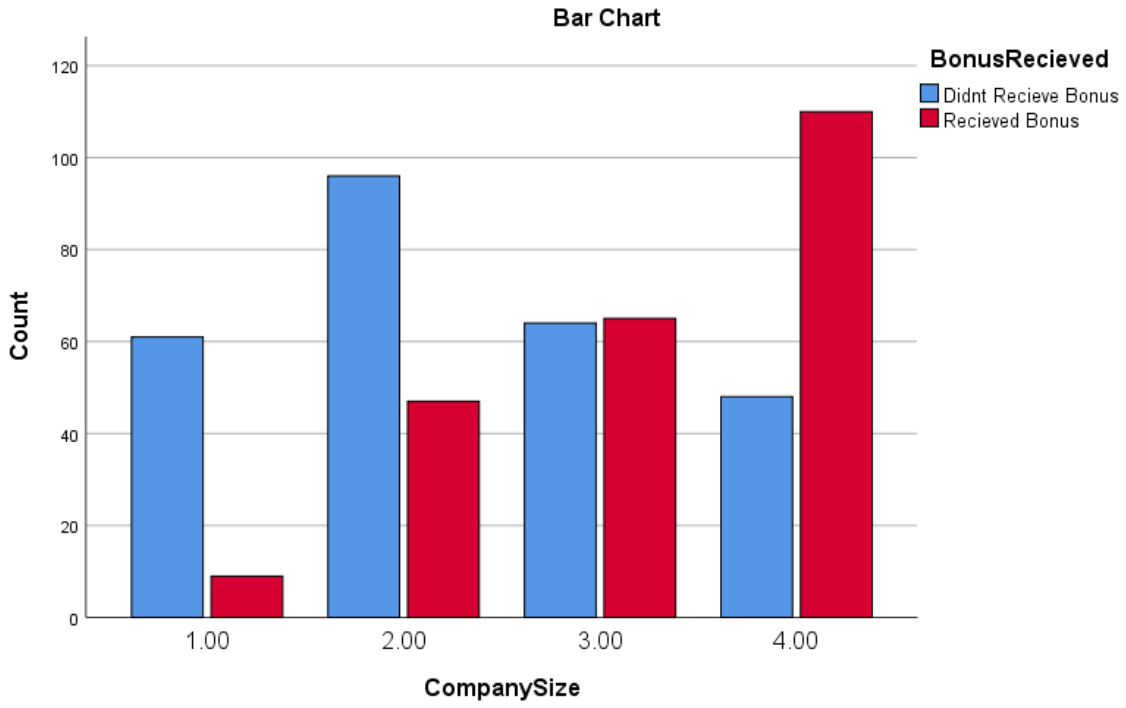
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 32.34.

Test Statistic: 77.314

P-value: < .001

Since p < .05, this tells us that there is a statistically **significant** association between company size and bonuses received. Evidence from sample would suggest that the bigger the company size is, the more likely you are to receive a bonus.

Conclusion: Reject Ho and fail to reject Ha. There is a statistically **significant** association between company size and bonuses received.



(vii) R Code

Import data in from SPSS, to assign variables their values:

```
totalEmployees <- dataFile$TotalEmployees
annualEarnings <- dataFile$Annual_Earnings
annualBonuses  <- dataFile$Annual_Bonuses
holidays <- dataFile$Holidays
education <- dataFile$Education
timePaidEmployed <- dataFile$Time_paid_employ
weeklyHours <- dataFile$WeeklyHours
age <- dataFile$age
jobCategory <- dataFile$JobCategory
companySize <- dataFile$CompanySize
bonusRecieved <- dataFile$BonusRecieved
```

(iii)

Code:

```
t.test(annualEarnings~jobCategory, var.eq = F)
```

Output:

```
Welch Two Sample t-test

data:  annualEarnings by jobCategory
t = 2.5833, df = 420.91, p-value = 0.01012
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
  3420.542 25191.172
sample estimates:
mean in group 1 mean in group 2
       72993.43        58687.58
```

(iv)

Code:

```
t.test(age~jobCategory, var.eq = T)
```

Output:

```
Two Sample t-test

data:  age by jobCategory
t = 6.8455, df = 498, p-value = 2.249e-11
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 4.811980 8.686079
sample estimates:
mean in group 1 mean in group 2
       43.62946        36.88043
```

(v)

Code:

```
oneway.test(holidays~as.factor(companySize), var.eq =F)
```

Output:

```
        One-way analysis of means (not assuming equal variances)

data:  holidays and as.factor(companySize)
F = 1.3578, num df = 3.00, denom df = 234.58, p-value = 0.2564
```

(vi)

Code:

```
chisq.test(table(bonusRecieved, companySize))
```

Output:

```
Pearson's Chi-squared test

data:  table(bonusRecieved, companySize)
X-squared = 77.314, df = 3, p-value < 2.2e-16
```