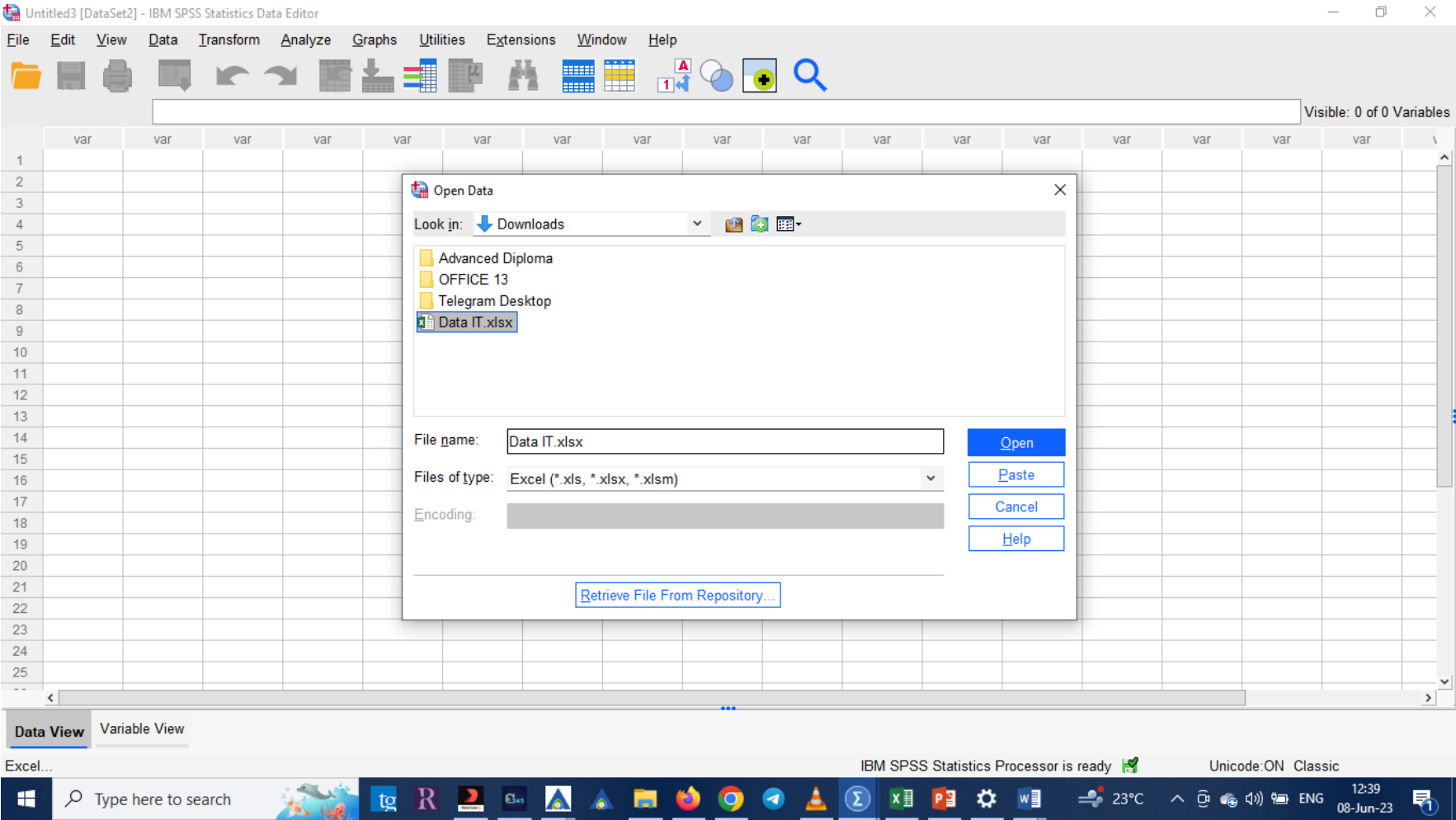


Question 1



219043418_KC Malatjie.sav [DataSet1] - IBM SPSS Statistics Data Editor

FileEditViewDataTransformAnalyzeGraphsUtilitiesExtensionsWindowHelp

Visible: 6 of 6 Variables

	Age	Gender	Race	Occupation	EducationQ ualification	Income	var	var	var	var	var	var	var	var	var
1	55	2	1	1	2	9200									
2	77	1	1	2	0	8200									
3	46	2	2	1	2	8200									
4	71	2	1	1	2	11600									
5	63	2	1	2	2	6600									
6	58	1	2	2	1	7100									
7	85	2	1	2	3	8800									
8	46	2	1	2	0	10200									
9	58	2	2	2	1	9300									
10	63	2	1	2	1	7700									
11	43	2	1	2	2	7200									
12	57	2	1	2	2	7500									
13	70	2	1	2	1	8500									
14	51	2	1	1	1	7600									
15	50	1	2	2	2	9500									
16	60	1	1	1	2	9900									
17	52	2	1	1	1	7700									
18	59	1	2	2	1	9400									
19	44	2	1	1	2	8000									
20	27	1	2	1	2	9800									
21	65	1	1	2	2	6800									
22	60	1	1	1	0	7600									
23	64	1	1	2	2	9800									
24	62	2	2	2	1	8500									
25	56	1	1	1	2	6300									

Data ViewVariable View

IBM SPSS Statistics Processor is readyUnicode:ON Classic

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08-Jun-23

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Power Analysis >
Meta Analysis >
Reports >
Descriptive Statistics >
Bayesian Statistics >
Tables >
Compare Means >
General Linear Model >
Generalized Linear Models >
Mixed Models >
Correlate >
Regression >
Loglinear >
Neural Networks >
Classify >
Dimension Reduction >
Scale >
Nonparametric Tests >
Forecasting >
Survival >
Multiple Response >
Missing Value Analysis... >
Multiple Imputation >
Complex Samples >
Simulation... >
Quality Control >
Spatial and Temporal Modeling... >
Direct Marketing >

Automatic Linear Modeling...
Linear...
Curve Estimation...
Partial Least Squares...
Binary Logistic...
Multinomial Logistic...
Ordinal...
Probit...
Nonlinear...
Weight Estimation...
2-Stage Least Squares...
Quantile...
Optimal Scaling (CATREG)...
Kernel Ridge...

Visible: 6 of 6 Variables

	Age	Gender	Income	var	var	var	var	var	var	var	var	var
1	55	2	9200									
2	77	1	8200									
3	46	2	8200									
4	71	2	11600									
5	63	2	6600									
6	58	1	7100									
7	85	2	8800									
8	46	2	10200									
9	58	2	9300									
10	63	2										
11	43	2										
12	57	2										
13	70	2										
14	51	2										
15	50	1										
16	60	1										
17	52	2										
18	59	1										
19	44	2										
20	27	1										
21	65	1										
22	60	1										
23	64	1										
24	62	2										
25	56	1										

Data View Variable View

Linear...

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23°C 12:46 08-Jun-23

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File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

Visible: 6 of 6 Variables

	Age	Gender	Race	Occupation	EducationQ	Income	var	var	var	var	var
1	55	2	1	1	1						
2	77	1	1	2	2						
3	46	2	2	1	1						
4	71	2	1	1	1						
5	63	2	1	2	2						
6	58	1	2	2	2						
7	85	2	1	2	2						
8	46	2	1	2	2						
9	58	2	2	2	2						
10	63	2	1	2	2						
11	43	2	1	2	2						
12	57	2	1	2	2						
13	70	2	1	2	2						
14	51	2	1	1	1						
15	50	1	2	2	2						
16	60	1	1	1	1						
17	52	2	1	1	1						
18	59	1	2	2	2						
19	44	2	1	1	1						
20	27	1	2	1	1						
21	65	1	1	2	2						
22	60	1	1	1	1						
23	64	1	1	2	2	9800					
24	62	2	2	2	2	8500					
25	56	1	1	1	1	6300					

Linear Regression

Dependent: Income

Block 1 of 1

Independent(s): Age

Method: Enter

Selection Variable: Rule...

Case Labels:

WLS Weight:

OK Paste Reset Cancel Help

Statistics... Plots... Save... Options... Style... Bootstrap...

Data View Variable View

IBM SPSS Statistics Processor is ready Unicode:ON Classic

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23°C 12:54 08-Jun-23

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.071 ^a	.005	-.012	1369.555	.005	.297	1	58	.588

a. Predictors: (Constant), Age

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
1	(Constant)	8041.424	965.396		8.330	<.001	6108.973	9973.874
	Age	8.729	16.027	.071	.545	.588	-23.352	40.811

a. Dependent Variable: Income

Step 1: Define the null and alternative Hypotheses

H_0 : $p = 0$ (age and income are not related)

H_1 : $p \neq 0$ (age and income are related)

Step 2: Determine the region of Acceptance of the Hypothesis

$\alpha = 0.05$ $df=1$ $t_{\text{crit}} = \pm 6.314$. Thus the region of Acceptance for H_0 is $-6.314 \leq t \leq +6.314$

The decision rule is then stated as follows:

- Accept H_0 if t-stat lies between -6.314 and +6.314 inclusive.
- Reject H_0 if t-stat lies below -6.314 or above +6.314

Step 3: The sample test Statistic (t-stat)

t-stat = 8.330

Step 4: Compare the sample test statistic of the Acceptance

t-stat = 8.330 lies outside (well above) the region of Acceptance of H_0

Step 5: Draw Statistical and Management Conclusions

- Reject H_0 at 5% level of significance. There is strong enough sample evidence to conclude that the population correlation coefficient is not zero. The alternative hypothesis is probably true.
- The sample evidence indicates that there is a genuine strong positive statistical relationship between age and income.

Question 2

IBM SPSS Statistics Data Editor

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	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
2	Gender	Numeric	1	0		{1, Male}...	None	12	Right	Nominal	Input
3	Race	Numeric	1	0		None	None	12	Right	Nominal	Input
4	Occupation	Numeric	1	0		None	None	12	Right	Nominal	Input
5	EducationQ...	Numeric	1	0	Education Qual...	None	None	12	Right	Nominal	Input
6	Income	Numeric	5	0		None	None				
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28											

Value Labels

Spelling...

Value Labels:

Value	Label
1	African
2	White

OK Reset Cancel Help

Data View Variable View

IBM SPSS Statistics Processor is ready Unicode:ON Classic

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IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

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3	Race	Numeric	1	0		{1, African}...	None	12	Right	Nominal	Input
4	Occupation	Numeric	1	0		{1, Engineer}...	None	12	Right	Nominal	Input
5	Education Qual...	Numeric	1	0	Education Qual...	None	None	12	Right	Nominal	Input
6	Income	Numeric	5	0							
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28											

One-Sample T Test

Test Variable(s):

- Age
- Gender
- Occupation
- Education Qualification [Education...]

Test Variable(s):

- Race
- Income

Test Value: 0.05 ☒ Estimate effect sizes

OK Paste Reset Cancel Help

Data View Variable View

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One-Sample Test

Test Value = 0.05

	t	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
Race	20.911	59	<.001	<.001	1.283	1.16	1.41
Income	48.695	59	<.001	<.001	8558.283	8206.61	8909.96

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Race	60	1.33	.475	.061
Income	60	8558.33	1361.367	175.752

Step 1: Define the null and alternative Hypotheses

Step 2: Determine the region of Acceptance of the Hypothesis

Step 3: The sample test Statistic (t-stat)

Step 4: Compare the sample test statistic of the Acceptance

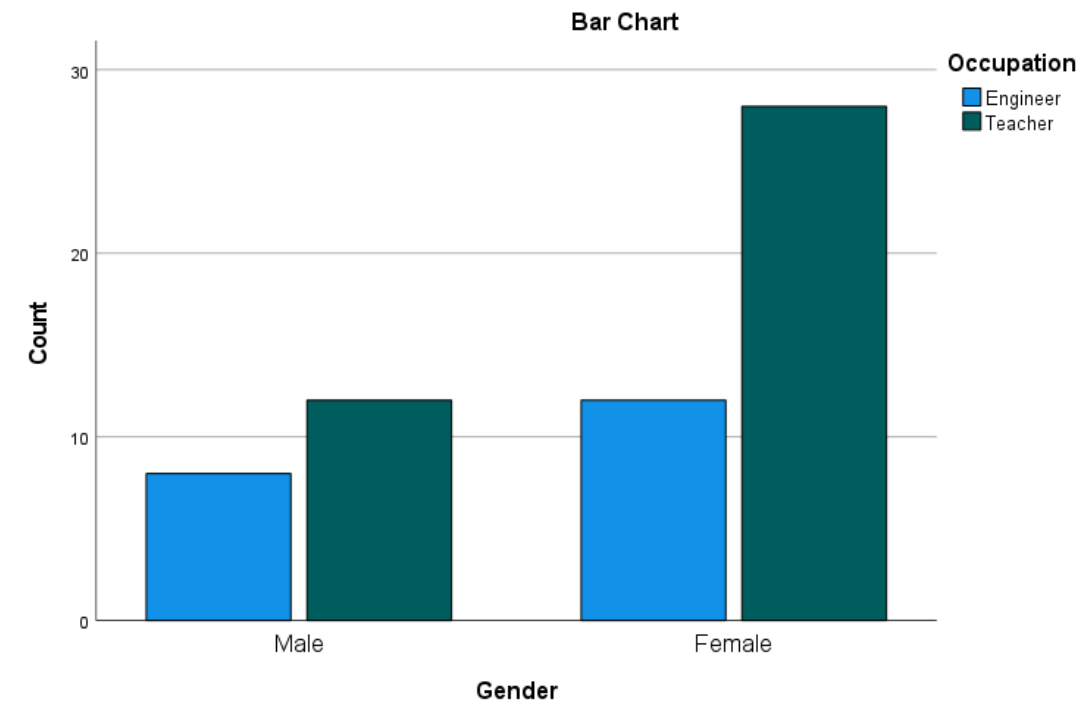
Step 5: Draw Statistical and Management Conclusions

Question 3

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.600 ^a	1	.439		
Continuity Correction ^b	.234	1	.628		
Likelihood Ratio	.592	1	.442		
Fisher's Exact Test				.563	.312
Linear-by-Linear Association	.590	1	.442		
N of Valid Cases	60				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.67.

b. Computed only for a 2x2 table



Gender * Occupation Crosstabulation

Count

		Occupation		
		Engineer	Teacher	Total
Gender	Male	8	12	20
	Female	12	28	40
Total		20	40	60

*219043418_KC_Malatjie.sav [DataSet2] - IBM SPSS Statistics Data Editor

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	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
2	Gender	Numeric	1	0		{1, Male}...	None	12	Right	Nominal	Input
3	Race	Numeric	1	0		{1, African}...	None	12	Right	Nominal	Input
4	Occupation	Numeric	1	0		None	None	12	Right	Nominal	Input
5	EducationQ...	Numeric	1	0	Education Qual...	None	None	12	Right	Nominal	Input
6	Income	Numeric	5	0		None	None				
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28											

Value Labels

Spelling...

Value Labels:

Value	Label
1	Engineer
2	Teacher

OKResetCancelHelp

Data ViewVariable View

IBM SPSS Statistics Processor is readyUnicode:ON Classic

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*219043418_KC_Malatjie.sav [DataSet2] - IBM SPSS Statistics Data Editor

FileEditViewDataTransformAnalyzeGraphsUtilitiesExtensionsWindowHelp

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3	Race	Numeric	1	0		{1, African}...	None	12	Right	Nominal	Input
4	Occupation	Numeric	1	0		None	None	12	Right	Nominal	Input
5	EducationQ...	Numeric	1	0	Education Qual...	None	None	12	Right	Nominal	Input
6	Income	Numeric	5	0		None	None	12	Right	Nominal	Input
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28											

Value Labels

Spelling...

Value Labels:

Value	Label
1	Male
2	Female

OKResetCancelHelp

Data ViewVariable View

IBM SPSS Statistics Processor is readyUnicode:ON Classic

Type here to search

20°C13:5309-Jun-23

*219043418_KC Malatjie.sav [DataSet2] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

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2	Gender	Numeric	1	0		{1, Male}...	None	12	Right	Nominal	Input
3	Race	Numeric	1	0		{1, African}...	None	12	Right	Nominal	Input
4	Occupation	Numeric	1	0							
5	EducationQ...	Numeric	1	0	Education Qual...						
6	Income	Numeric	5	0							
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27											
28											

Crosstabs

Row(s): Gender

Column(s): Occupation

Layer 1 of 1

Previous Next

☐ Display clustered bar charts

☐ Suppress tables

OK Paste Reset Cancel Help

Exact... Statistics... Cells... Format... Style... Bootstrap...

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Step 1: Define the null and Alternative Hypotheses

$H_0: p = 0$ There is no association between gender and Occupation.

$H_1: p \neq 0$ there is association between gender and Occupation

Step 2: Determine the region of Acceptance of the null Hypothesis

$\alpha = 0.05$ $df = 1$ $X^2_{\text{Crit}} = 3.843$ $P\text{-Value} = 0.442$

Accept H_0 if $X^2\text{-stat} \leq 0.600$

Reject H_0 if $X^2\text{-stat} > 0.600$

Step 3: the sample Statistics for this test

$X^2\text{-stat} = 0.600$

Step 4: Compare the Sample test statistic to the region of acceptance.

$X^2\text{-stat} \leq 0.600$, which lies below the acceptance region of $X^2_{\text{crit}} = 3.843$

$p\text{-value} = 0.442$, which is 44.2%

Step 5: Draw Statistical and Management Conclusions

- Since the $p\text{-value} > 0.05$, Accept H_0 at the 5% level of Significance. The $p\text{-value}$ implies that there is only weak sample evidence to reject H_0 in Favour of H_1 .
- There is no association between gender and occupation.