

# Sheth L.U.J. And Sir M.V. College

## Conducting Chi-square tests using chisq.test() (R) Output:-

RStudio  
File Edit Code View Plots Session Build Debug Profile Tools Help  
Console Terminal Background Jobs  
R - R 4.5.2 - /  
> countries <- read.csv("countries.csv")  
> str(countries)  
'data.frame': 188 obs. of 21 variables:  
 \$ Country : chr "Afghanistan" "Albania" "Algeria" "Angola"  
 \$ Region : chr "Middle East/Central Asia" "Northern/Eastern Europe" "Africa" "Africa" ...  
 \$ Population.millions. : num 29.82 3.16 38.48 20.82 0.09 ...  
 \$ HDI : num 0.46 0.73 0.73 0.52 0.78 0.83 0.73 NA 0.9 0.88 ...  
 \$ GDP.per.Capita : chr "\$614.66" "\$4,534.37" "\$5,430.57" "\$4,66 5.91" ...  
 \$ Cropland.Footprint : num 0.3 0.78 0.6 0.33 NA 0.78 0.74 NA 2.68 0.82 ...  
 \$ Grazing.Footprint : num 0.2 0.22 0.16 0.15 NA 0.79 0.18 NA 0.63 0.21 ...  
 \$ Forest.Footprint : num 0.08 0.25 0.17 0.12 NA 0.29 0.34 NA 0.89 0.63 ...  
 \$ Carbon.Footprint : num 0.18 0.87 1.14 0.2 NA 1.08 0.89 NA 4.85 4.14 ...  
 \$ Fish.Footprint : num 0 0.02 0.01 0.09 NA 0.1 0.01 NA 0.11 0.06 ...  
 \$ Total.Ecological.Footprint : num 0.79 2.21 2.12 0.93 5.38 ...  
 \$ Cropland : num 0.24 0.55 0.24 0.2 NA 2.64 0.44 NA 5.42 0.71 ...  
 \$ Grazing.Land : num 0.2 0.21 0.27 1.42 NA 1.86 0.26 NA 5.81 0.16 ...  
 \$ Forest.Land : num 0.02 0.29 0.03 0.64 NA 0.66 0.1 NA 2.01 2.04 ...  
 \$ Fishing.Water : num 0 0.07 0.01 0.26 NA 1.67 0.02 NA 3.19 0 ...  
 \$ Urban.Land : num 0.04 0.06 0.03 0.04 NA 0.1 0.07 NA 0.14 0.15 ...  
 \$ Total.Biocapacity : num 0.5 1.18 0.59 2.55 0.94 ...  
 \$ Biocapacity.Deficit.or.Reserve : num -0.3 -1.03 -1.53 1.61 -4.44 ...  
 \$ Earths.Required : num 0.46 1.27 1.22 0.54 3.11 1.82 1.29 6.86

Environment History Connections Tutorial  
Global Environment  
chi\_result List of 9  
clean\_exact 55 obs. of 3 variables  
combined\_data 100 obs. of 2 variables  
countries 188 obs. of 21 variables  
cyl\_pivot 32 obs. of 4 variables  
describe\_vars 18249 obs. of 6 variables  
df 32 obs. of 4 variables  
duplicates\_report 13 obs. of 4 variables  
Files Plots Packages Help Viewer Presentation  
New Folder New File Delete Rename More  
Home Name Size Modified  
Telco.csv 954.6 KB Dec 1, 2025, 11:15 AM  
tips.csv 8 KB Nov 24, 2025, 12:55 PM  
titanic\_submission.csv 2.8 KB Dec 1, 2025, 12:27 PM  
tmdb\_5000\_movies.csv 5.4 MB Dec 1, 2025, 10:57 AM  
utils.js 497 B Nov 21, 2025, 2:14 PM  
Virtual Machines  
wine\_dataset.csv 11.2 KB Nov 24, 2025, 12:45 PM  
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Practical\_No\_7M2.R 191 B Jan 5, 2026, 9:51 AM  
cars.csv 7.2 MB Jan 5, 2026, 9:42 AM  
countries.csv 22 KB Jan 5, 2026, 9:36 AM  
Indian Liver Patient Dataset (ILPD).csv 23.3 KB Jan 5, 2026, 9:35 AM  
Practical\_No\_8M2.R 235 B Jan 5, 2026, 9:55 AM  
Practical\_No\_9M2.R 380 B Jan 5, 2026, 10:09 AM  
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> data.quality  
> countries\$continent <- as.factor(countries\$continent)  
Error in `<-data.frame`(`\*tmp\*`, continent, value = integer(0)) :  
replacement has 0 rows, data has 188  
  
> countries\$income\_level <- as.factor(countries\$income\_level)  
Error in `<-data.frame`(`\*tmp\*`, income\_level, value = integer(0)) :  
replacement has 0 rows, data has 188  
  
> contingency\_table <- table(countries\$continent, countries\$income\_level)  
> print(contingency\_table)  
< table of extent 0 x 0 >  
> chi\_result <- chisq.test(contingency\_table)  
Error in chisq.test(contingency\_table) :  
at least one entry of 'x' must be positive  
  
> print(chi\_result)  
Error: object 'chi\_result' not found  
  
> print(chi\_result\$expected)  
Error: object 'chi\_result' not found  
  
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Name:- Mithil Kadam  
Roll No. S083  
Subject:- Data Analysis With SAS / SPSS / R

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```
a"...
$ Region : chr "Middle East/Central Asia" "Northern/Eastern Europe" "Africa" "Africa" ...
$ Population..millions. : num 29.82 3.16 38.48 20.82 0.09 ...
$ HDI : num 0.46 0.73 0.73 0.52 0.78 0.83 0.73 NA 0.9 ...
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$ Earths.Required : num 0.46 1.27 1.22 0.54 3.11 1.82 1.29 6.86 ...
5.37 3.5 ...
$ Countries.Required : num 1.6 1.87 3.61 0.37 5.7 ...
$ Data.Quality : chr "6" "6" "5" "6" ...
> countries$Region <- as.factor(countries$Region)
> countries$data.Quality <- as.factor(countries$data.Quality)
```

Environment History Connections Tutorial

Project: (None)

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- Telco.csv
- tips.csv
- titanic\_submission.csv
- tmdb\_5000\_movies.csv
- utils.js
- Virtual Machines
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- cars.csv
- countries.csv
- Indian Liver Patient Dataset (ILPD).csv
- Practical\_No\_BM2.R
- Practical\_No\_9M2.R

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Source

Console Terminal Background Jobs

```
> countries$Region <- as.factor(countries$Region)
> countries$data.Quality <- as.factor(countries$data.Quality)
> contingency_table <- table(countries$Region, countries$data.quality)
> print(contingency_table)
```

	2	3B	3L	3T	4	5	6
Africa	1	7	4	1	20	18	
Asia-Pacific	1	8	3	2	0	6	13
European Union	0	0	0	2	0	16	8
Latin America	4	8	6	1	0	13	7
Middle East/Central Asia	0	6	5	0	5	7	
North America	0	0	0	1	0	1	1
Northern/Eastern Europe	0	0	0	0	1	5	6

```
> chi_result <- chisq.test(contingency_table)

Warning message:
In chisq.test(contingency_table) :
  Chi-squared approximation may be incorrect

> print(chi_result)

Pearson's Chi-squared test

data: contingency_table
X-squared = 59.843, df = 36, p-value = 0.007542

> print(chi_result$expected)
```

	2	3B	3L	3T	4
Africa	1.65957447	8.021277	4.978723	1.9361702	0.55319149
Asia-Pacific	1.05319149	5.090426	3.159574	1.2287234	0.35106383
European Union	0.82978723	4.010638	2.489362	0.9680851	0.27659574
Latin America	1.24468085	6.015957	3.734043	1.4521277	0.41489362
Middle East/Central Asia	0.73404255	3.547872	2.202128	0.8563830	0.24468085
North America	0.09574468	0.462766	0.287234	0.1117021	0.03191489
Northern/Eastern Europe	0.38297872	1.851064	1.148936	0.4468085	0.12765957

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Project: (None)

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Console Terminal Background Jobs

```
R - R 4.5.2 - ~/R
Northern/Eastern Europe
> chi_result <- chisq.test(contingency_table)

Warning message:
In chisq.test(contingency_table) :
  Chi-squared approximation may be incorrect

> print(chi_result)

Pearson's Chi-squared test

data: contingency_table
X-squared = 59.843, df = 36, p-value = 0.007542

> print(chi_result$expected)

          2      3B      3L      3T      4
Africa     1.65957447 8.021277 4.978723 1.9361702 0.55319149
Asia-Pacific 1.05319149 5.090426 3.159574 1.2287234 0.35106383
European Union 0.82978723 4.010638 2.489362 0.9680851 0.27659574
Latin America 1.24468085 6.015957 3.734043 1.4521277 0.41489362
Middle East/Central Asia 0.73404255 3.547872 2.202128 0.8563830 0.24468085
North America 0.09574468 0.462766 0.287234 0.1117021 0.03191489
Northern/Eastern Europe 0.38297872 1.851064 1.148936 0.4468085 0.12765957

          5      6
Africa     18.255319 16.5957447
Asia-Pacific 11.585106 10.5319149
European Union 9.127660 8.2978723
Latin America 13.691489 12.4468085
Middle East/Central Asia 8.074468 7.3404255
North America 1.053191 0.9574468
Northern/Eastern Europe 4.212766 3.8297872
```

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