

Sheth I.u.j. And sir m.v. college of arts science and commerce

Practical no. 6 mod2

Aim: Performing paired t-tests using t.test(paired=TRUE) ®

The screenshot shows the RStudio interface. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. The left pane contains several tabs: im_Analytics, 4th.R*, Airline_Delay_Cause, Agriculture_price_dataset, 5th.R*, crime, Untitled3*, employee, and a Source tab. The main workspace shows the following R code and its output:

```
1 data <- read.csv("global_earthquakes_10yrs_M4.5_2025-12-10.csv")
2
3 head(data, 10)
  time latitude longitude depth mag magType nst gap dmin rms net
1 2015-12-30 23:20:56.840000+00:00 0.0229 123.8194 143.05 4.6 mb NA 51 1.488 0.83 us
2 2015-12-30 21:29:23.040000+00:00 -30.6777 -71.7346 25.62 4.5 mb NA 180 0.085 0.94 us
3 2015-12-30 19:50:48.210000+00:00 -40.5641 173.4219 142.40 4.6 mb NA 65 0.653 0.70 us
4 2015-12-30 18:26:34.610000+00:00 -24.4715 -175.8716 24.21 4.9 mb NA 77 5.097 0.99 us
5 2015-12-30 14:46:47.730000+00:00 -5.9568 154.9611 184.56 4.5 mb NA 94 3.292 0.76 us
6 2015-12-30 12:57:36.210000+00:00 33.8836 137.3211 338.23 4.5 mb NA 57 1.066 0.75 us
7 2015-12-30 12:50:12.930000+00:00 -18.0505 -178.7085 607.86 4.5 mb NA 192 3.098 0.67 us
8 2015-12-30 11:53:51.690000+00:00 40.9013 142.7915 51.54 4.5 mb NA 134 1.146 0.60 us
9 2015-12-30 11:08:36+00:00 -21.9779 -174.4701 46.15 5.0 mb NA 50 7.880 0.85 us
10 2015-12-30 10:46:44+00:00 19.3214 121.1273 28.55 4.5 mb NA 51 3.479 0.95 us
  id updated place type
1 us10004aif 2016-03-18T01:13:08.040Z 101 km SE of Gorontalo, Indonesia earthquake
2 us10004ahx 2016-03-18T01:13:08.040Z 52 km W of Ovalle, Chile earthquake
3 us10004agf 2022-08-02T02:00:26.953Z 61 km ENE of Takaka, New Zealand earthquake
4 us10004bu1 2016-11-10T22:06:33.391Z south of Tonga earthquake
5 us10004btx 2016-03-18T01:13:08.040Z 70 km NW of Panguna, Papua New Guinea earthquake
6 us10004aep 2016-03-18T01:13:08.040Z 79 km SSE of Toba, Japan earthquake
7 us10004bu0 2016-03-18T01:13:08.040Z 209 km E of Levuka, Fiji earthquake
8 us10004aeg 2016-03-18T01:13:08.040Z 117 km ENE of Hachinohe, Japan earthquake
9 us10004ae8 2016-11-10T22:06:32.298Z Tonga earthquake
10 us10004ae4 2016-03-18T01:13:08.040Z 78 km N of Namuac, Philippines earthquake
  horizontalError depthError magError magNst status locationSource magSource
1 6.4 6.7 0.083 43 reviewed us us
2 3.9 5.4 0.192 8 reviewed us us
3 7.3 6.3 0.097 34 reviewed us us
4 13.7 4.7 0.074 57 reviewed us us
5 11.6 8.2 0.101 29 reviewed us us
6 7.4 5.8 0.053 103 reviewed us us
```

The right pane shows the Global Environment browser with various objects listed:

- data: 80829 obs. of 22 vars
- data_full: 4573 obs. of 15 vars
- data1: 4573 obs. of 3 vars
- data2: 100000 obs. of 20 vars
- data3: 29999 obs. of 15 vars
- employee_s...: 50 obs. of 9 variables
- global_ear...: 80829 obs. of 22 vars
- market_data: 737392 obs. of 10 vars

The Files pane shows the project structure:

- Home
 - .Rhistory 1
 - 1st mod2.R 2
 - 2nd.R 5
 - 4th.R 2
 - 5th.R 7
 - 14th.R 1
 - Agriculture_price_dataset.csv 5
 - Airline_Delay_Cause.csv 4
 - Amazon.csv 1
 - amsterdam_weekdays.csv 2
 - apache-maven-3.9.11-bin 8
 - apache-maven-3.9.11-bin.zip 8
 - apache-tomcat-9.0.109-windows-x64 1
 - apache-tomcat-9.0.109-windows-x64 1

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RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

im_Analytics * 4th.R* Airline_Delay_Cause * Agriculture_price_dataset * Sth.R* crime * Untitled3* employee * Run Source Environment History Import R Global Enviro data 8 data_full 4 data1 4 data2 1 data3 2 employee_s... 5 global_ear... 8 market_data 7

R 4.5.2 · ~/ R Script

```
1 data <- read.csv("global_earthquakes_10yrs_M4.5_2025-12-10.csv")
2
3
4
5
6 us10004aep 2016-03-18T01:13:08.040Z      79 km SSE of Toba, Japan earthquake
7 us10004bu0 2016-03-18T01:13:08.040Z      209 km E of Levuka, Fiji earthquake
8 us10004aeg 2016-03-18T01:13:08.040Z      117 km ENE of Hachinohe, Japan earthquake
9 us10004ae8 2016-11-10T22:06:32.298Z      Tonga earthquake
10 us10004ae4 2016-03-18T01:13:08.040Z      78 km N of Namuac, Philippines earthquake
horizontalError depthError magError magNst status locationSource magSource
1          6.4       6.7   0.083    43 reviewed      us      us
2          3.9       5.4   0.192     8 reviewed      us      us
3          7.3       6.3   0.097    34 reviewed      us      us
4         13.7       4.7   0.074    57 reviewed      us      us
5         11.6       8.2   0.101    29 reviewed      us      us
6          7.4       5.8   0.053   103 reviewed      us      us
7         14.2      12.7   0.140    15 reviewed      us      us
8          7.5       7.7   0.136    20 reviewed      us      us
9          8.5       5.4   0.043   177 reviewed      us      us
10         7.7       4.7   0.085    43 reviewed      us      us
>
> # Paired t-test using two columns from the CSV
> t.test(data$depth, data$mag, paired = TRUE)

Paired t-test

data: data$depth and data$mag
t = 143.57, df = 80828, p-value < 2.2e-16
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 56.51354 58.07787
sample estimates:
mean difference
 57.29571

> |
```

Files Plots Packages .Rhistory 1st mod2.R 2nd.R 4th.R 5th.R 14th.R Agriculture_p Airline_Delay Amazon.csv amsterdam_v apache-mave apache-mave apache-tomc apache-tomc