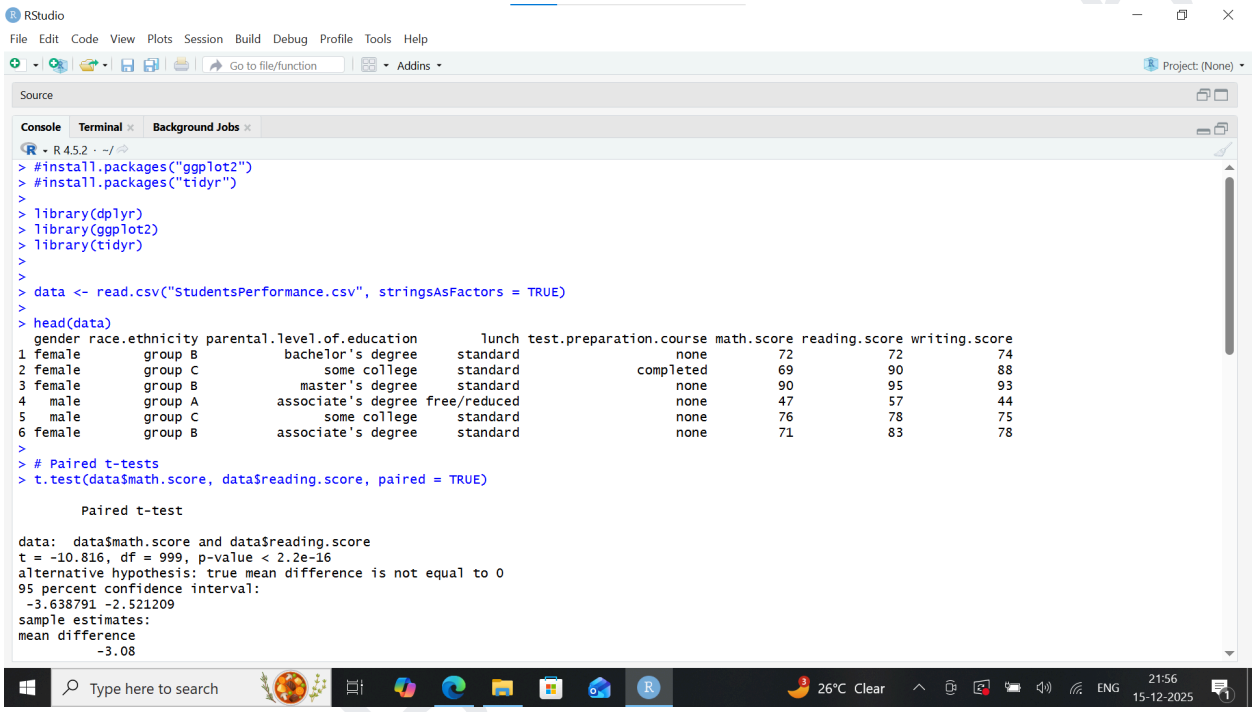
SHETH L.U.J. AND SIR M.V. COLLEGE OF ARTS SCIENCE AND COMMERCE

SUBJECT : R Programming

Practical No 6 Module II

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

Output :



NAME : SHUBHAM SANJAY KARAPE

ROLL NO : S085

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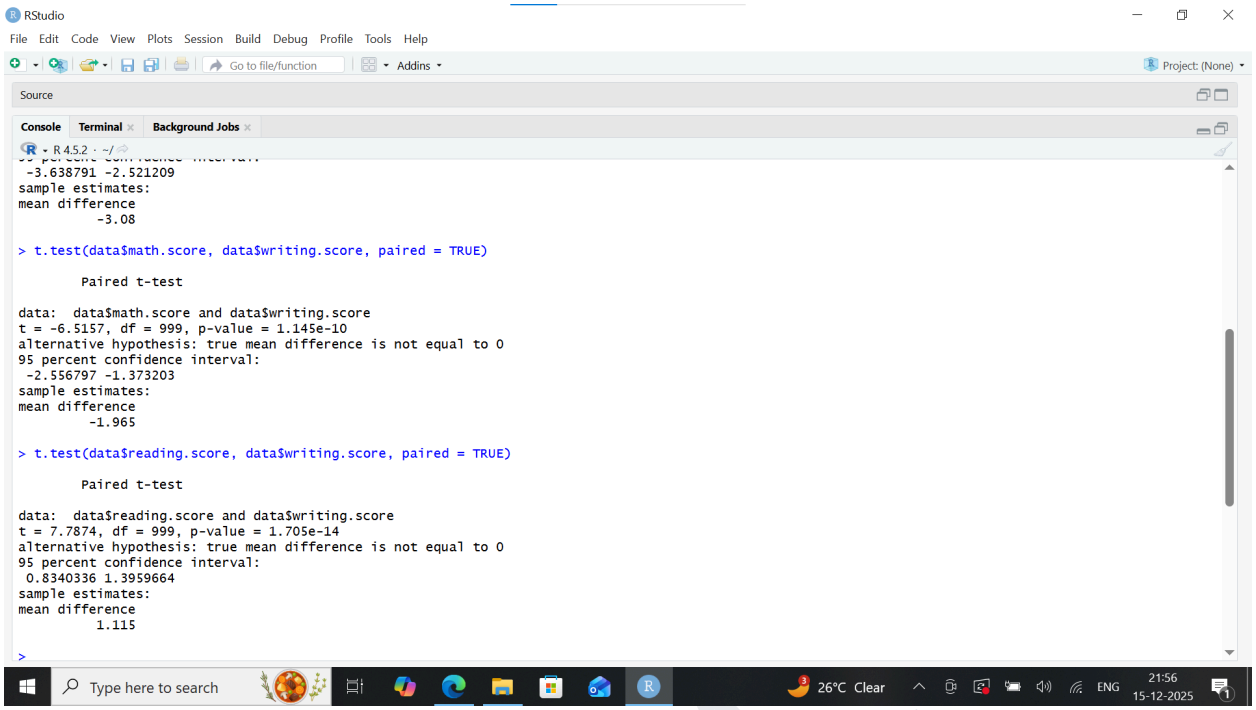
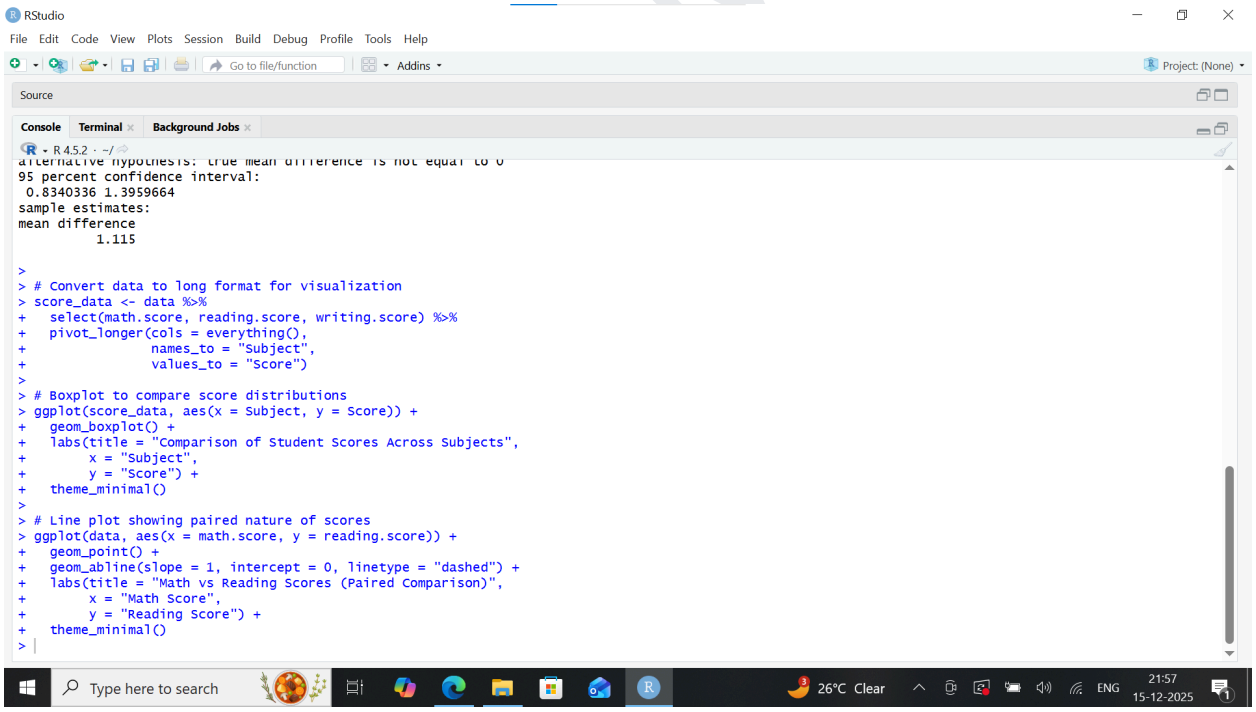


```
 -3.638791 -2.521209
sample estimates:
mean difference
          -3.08

> t.test(data$math.score, data$writing.score, paired = TRUE)

        Paired t-test

data:  data$math.score and data$writing.score
t = -6.5157, df = 999, p-value = 1.145e-10
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 -2.556797 -1.373203
sample estimates:
mean difference
         -1.965

> t.test(data$reading.score, data$writing.score, paired = TRUE)

        Paired t-test

data:  data$reading.score and data$writing.score
t = 7.7874, df = 999, p-value = 1.705e-14
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 0.8340336 1.3959664
sample estimates:
mean difference
          1.115

>
```



```
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 0.8340336 1.3959664
sample estimates:
mean difference
          1.115

>
> # Convert data to long format for visualization
> score_data <- data %>%
+   select(math.score, reading.score, writing.score) %>%
+   pivot_longer(cols = everything(),
+                names_to = "Subject",
+                values_to = "Score")
>
> # Boxplot to compare score distributions
> ggplot(score_data, aes(x = Subject, y = Score)) +
+   geom_boxplot() +
+   labs(title = "Comparison of Student Scores Across Subjects",
+        x = "Subject",
+        y = "Score") +
+   theme_minimal()
>
> # Line plot showing paired nature of scores
> ggplot(data, aes(x = math.score, y = reading.score)) +
+   geom_point() +
+   geom_abline(slope = 1, intercept = 0, linetype = "dashed") +
+   labs(title = "Math vs Reading Scores (Paired Comparison)",
+        x = "Math Score",
+        y = "Reading Score") +
+   theme_minimal()
>
```

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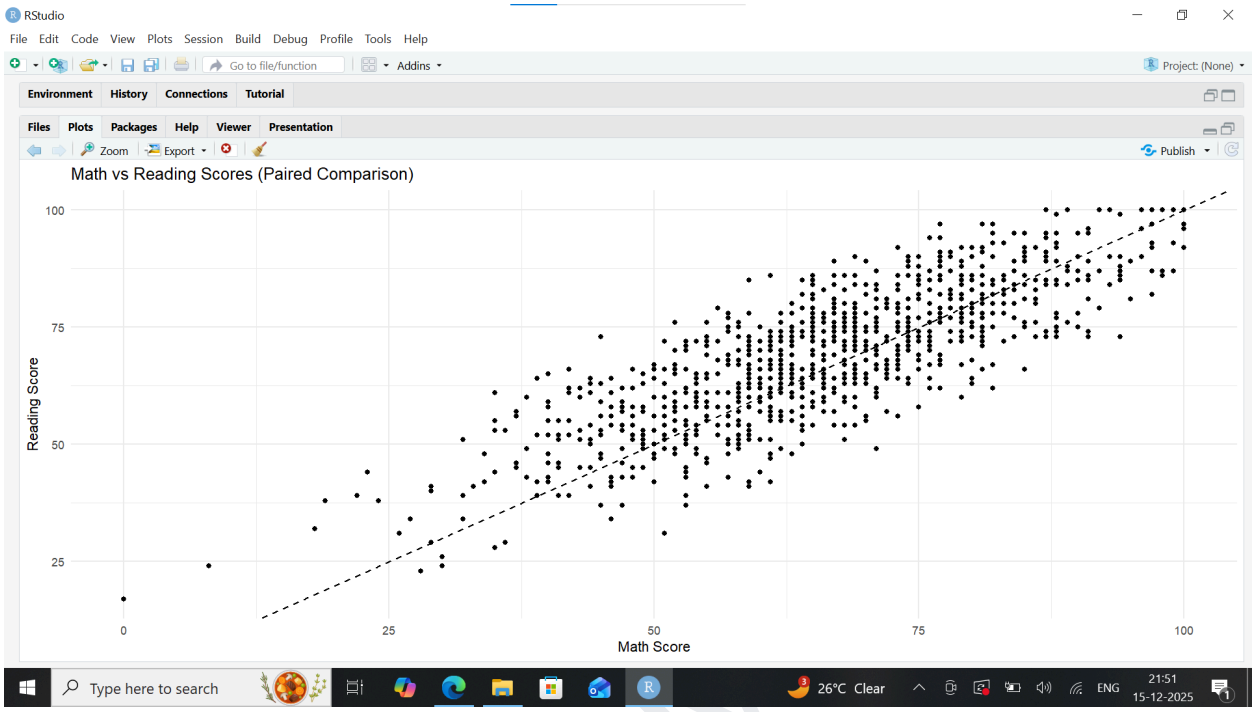

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