3. Time Series Data

Date	Sales
2023-01-01	100
2023-02-01	120
2023-03-01	150
2023-04-01	130
2023-05-01	140

- Create a line plot of Sales over time.
- Generate a bar plot showing monthly average Sales.
- Plot a seasonal decomposition of Sales.
- Create a lag plot to analyze autocorrelation in Sales.
- Generate a time series plot with a smoothed line of Sales.

R Program :-

```
dates <- as.Date(c("2023-01-01", "2023-02-01", "2023-03-01", "2023-04-01", "2023-05-01"))

sales <- c(100, 120, 150, 130, 140)


# Create a line plot of Sales over time

plot(dates, sales, type="l", main="Sales Over Time", xlab="Date", ylab="Sales")


# Generate a bar plot showing monthly average Sales

barplot(sales, names.arg=format(dates, "%b"), main="Monthly Average Sales", xlab="Month", ylab="Sales")


# Plot a simplified seasonal decomposition of Sales

# Note: This is a simplified version as we don't have enough data for a proper seasonal decomposition

# We'll just plot the original series with some trend-like data for illustration

plot(dates, sales, type="l", main="Simplified Seasonal Decomposition of Sales", xlab="Date", ylab="Sales")

lines(dates, cumsum(sales)/seq_along(sales), col="red")  # Just an illustrative trend


# Create a lag plot to analyze autocorrelation in Sales
```

```
plot(sales[-length(sales)], sales[-1], main="Lag Plot of Sales", xlab="Sales(t)",
ylab="Sales(t+1)")


# Generate a time series plot with a smoothed line of Sales

plot(dates, sales, type="l", main="Sales Over Time with Smoothed Line", xlab="Date",
ylab="Sales")

lines(dates, lowess(sales)$y, col="red")
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> # Create a lag plot to analyze autocorrelation in Sales
> plot(sales[-length(sales)], sales[-1], main="Lag Plot of Sales", xlab="Sales(t)", ylab="Sa ..." ... [TRUNCATED]

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> plot(dates, sales, type="l", main="Sales Over Time with Smoothed Line", xlab="Date", y .... [TRUNCATED]

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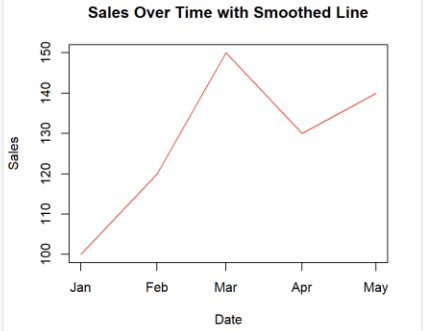

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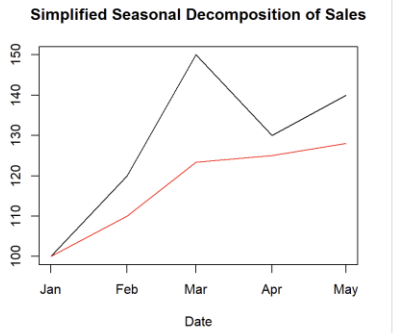

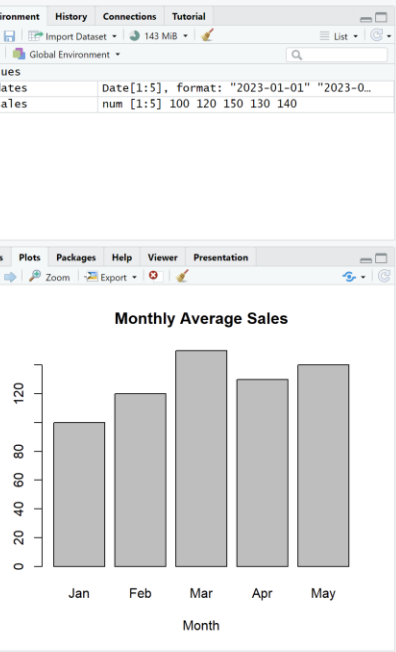

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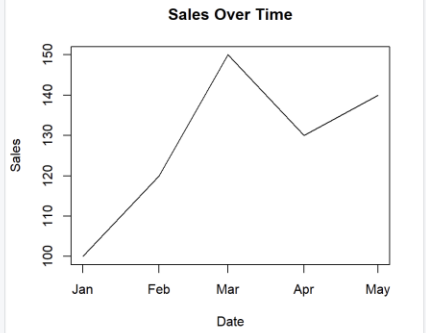

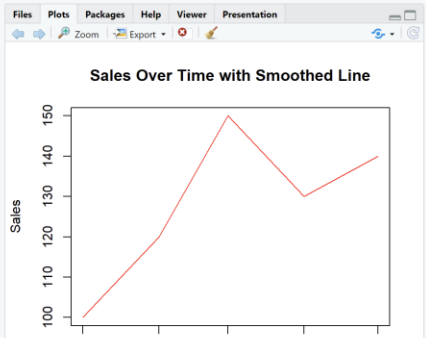

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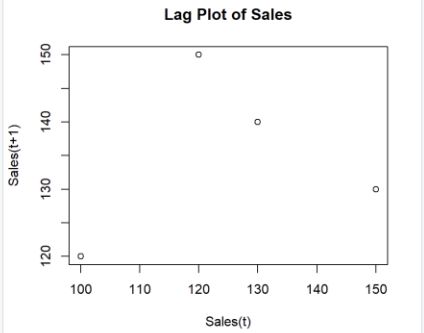

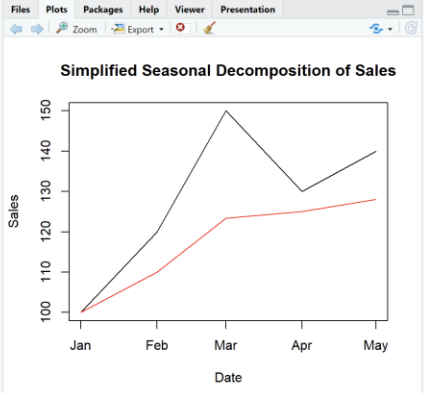

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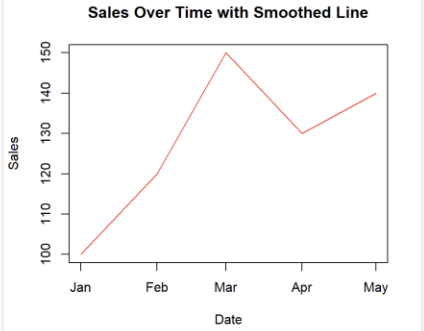

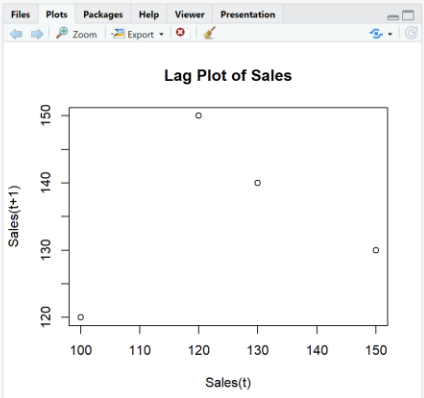

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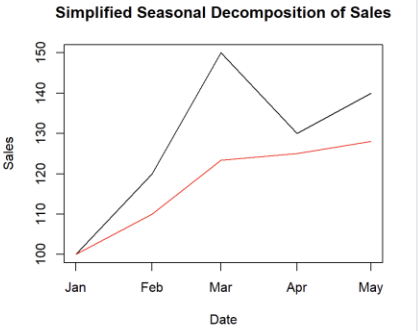

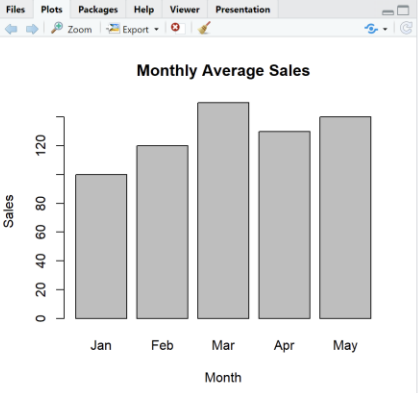

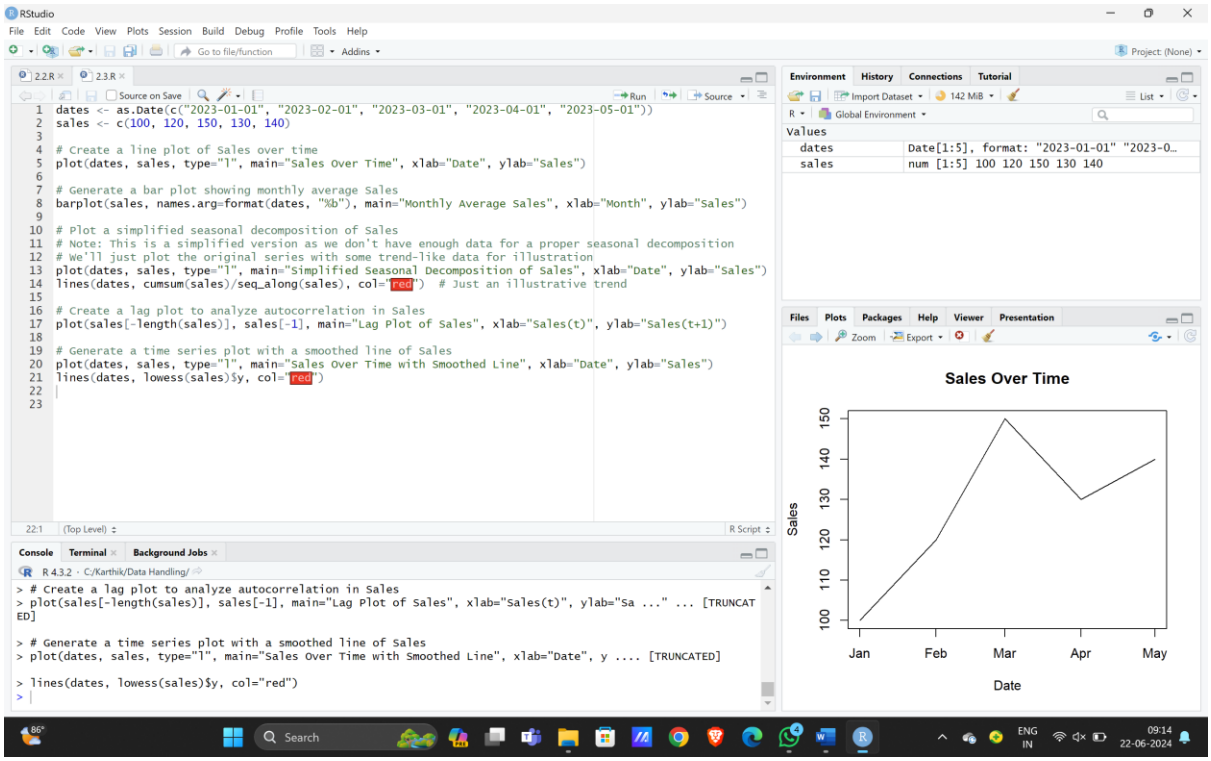
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
2.2.R
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Environment History Connections Tutorial
Values
dates Date[1:5], format: "2023-01-01" "2023-0…
sales num [1:5] 100 120 150 130 140
Files Plots Packages Help Viewer Presentation
Sales Over Time
Sales
100 110 120 130 140 150
Jan Feb Mar Apr May
Date
Console Terminal Background Jobs
R 4.3.2 · C:/Karthik/Data Handling/
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