Capstone Project

Assignment 2

Course code: CSA

Course : DWDM

S.No: 23

Name : K.VIVEK REDDY

Reg. No: 192210103

Slot : c

Title : FORECASTING DEMAND FOR RETAIL INVENTORY MANAGEMENT SYSTEM

Assignment Release Date :

Assignment Preliminary Stage (Assignment 2) submission Date :

Mentor Name : Dr.Murphy.M

Mentor Phone number and Department : Electro Chemistry

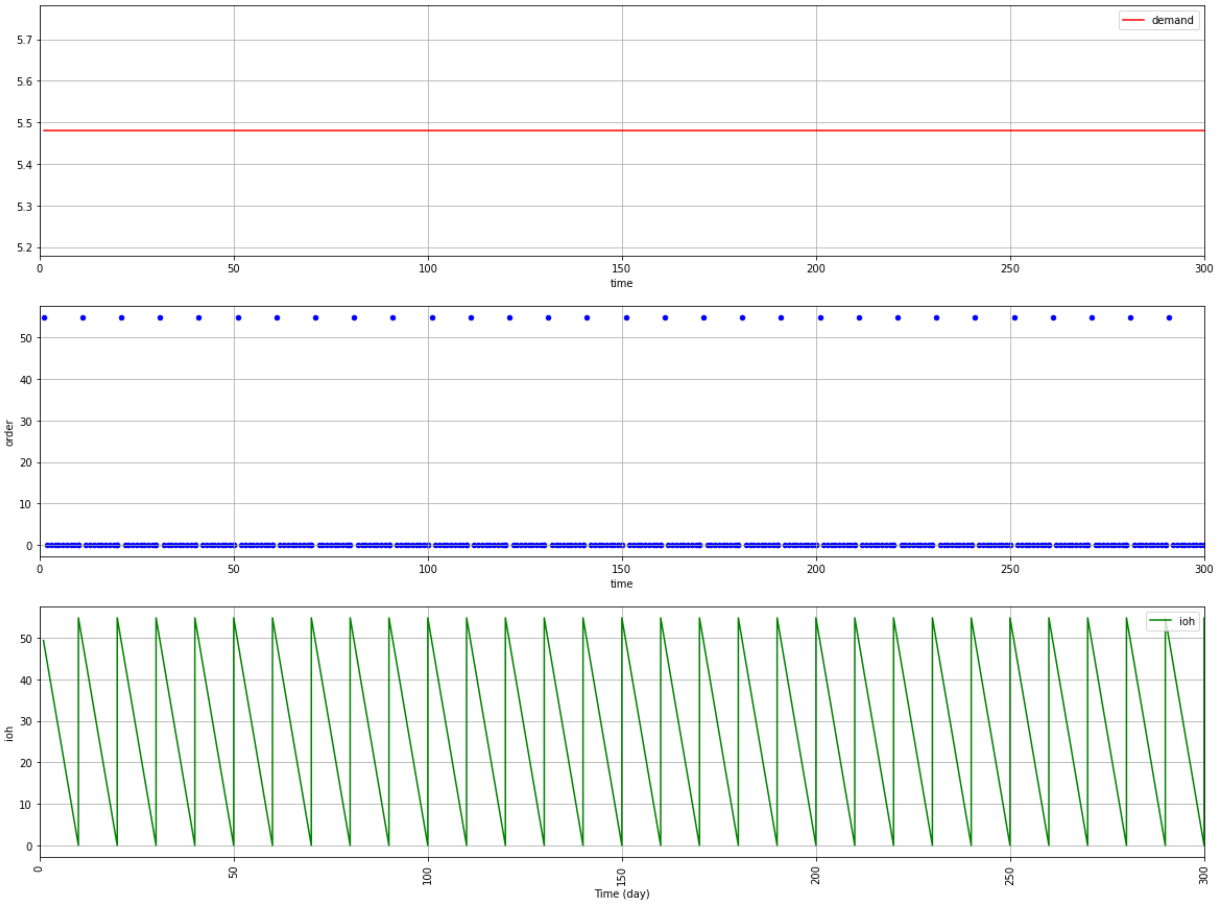
CODE:

```
# Load necessary libraries
install.packages("ggplot2")

library(ggplot2)

# Parameters
D <- 2000  # Total Demand (units/year)
T_total <- 365  # Total Time (days)
D_day <- D / T_total  # Demand per day (unit/day)
T <- 10  # Replenishment Period
Q <- D_day * T  # Order Quantity

# Functions
# Deterministic constant demand
demand <- function(D) {
  return(D)
}

# Order every cycle time
order <- function(t, T, Q) {
  if (((t - 1) %% T) == 0 || t == 1) {
    result <- Q
  } else {
    result <- 0
  }
  return(result)
```

```
}

# Simulation function
sim <- function(Q, T, D_day, T_total) {
  df_sim <- data.frame('time' = 1:T_total)
  df_sim$demand <- sapply(df_sim$time, function(t) demand(D_day))
  df_sim$order <- sapply(df_sim$time, function(t) order(t, T, Q))
  df_sim$ioh <- cumsum(df_sim$order) - cumsum(df_sim$demand)
  return(df_sim)
}

# Run simulation
df_sim <- sim(Q, T, D_day, T_total)

# Plot
ggplot(df_sim, aes(x = time)) +
  geom_line(aes(y = demand), color = "red") +
  geom_point(aes(y = order), color = "blue") +
  geom_line(aes(y = ioh), color = "green") +
  labs(title = "Retail Inventory Management Simulation",
       x = "Time (day)", y = "Units") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 90, vjust = 0.5, hjust = 1)) +
  ylim(0, max(max(df_sim$demand), max(df_sim$order), max(df_sim$ioh))) +
  scale_colour_manual(values=c("red", "blue", "green")) +
  theme(plot.title = element_text(hjust = 0.5))
```

OUTPUT:

Data	
df_sim	365 obs. of 4 variables
$ time : int	1 2 3 4 5 6 7 8 9 10 ...
$ demand: num	5.48 5.48 5.48 5.48 5.48 ...
$ order : num	54.8 0 0 0 0 ...
$ ioh : num	49.3 43.8 38.4 32.9 27.4 ...
source_data	3 obs. of 2 variables
$ Source: chr	"Source1" "Source2" "Source3"
$ Count : num	100 200 150
Values	
D	2000
D_day	5.47945205479452
Q	54.7945205479452
T	10
T_total	365
Functions	
ClassifierTrain	function (train_features, train_class)
demand	function (D)
MakeFeatureWordsDict	function (all_words_tf_dict, stopwords_set, writewords_...
MakeTextMining	function (posts, time_col, content_col, source_col, t_s...
MakeTextMining_Calen...	function (posts, time_col, content_col, source_col, t_s...
MakeTextMining_Class...	function (posts, time_col, content_col, source_col, t_s...
order	function (t, T, Q)
sim	function (Q, T, D_day, T_total)
TextFeature	function (words_feature, textseg_list)
TextSeg	function (text, lag)


demand
5.7
5.6
5.5
5.4
5.3
5.2
0
50
100
150
200
250
300
time

order
50
40
30
20
10
0
0
50
100
150
200
250
300
time

ioh
ioh
50
40
30
20
10
0
0
50
100
150
200
250
300
Time (day)