md = read.csv("G:/elance\_deepti/AssignmentExperts/2018/April/data\_new.csv", header = TRUE, sep = ",", stringsAsFactors = FALSE)

md$strDate <- as.Date(md$PerDate)

summary(md)

plot(md$strDate,md$PureNumber, type = "l", xlab = "Period", ylab = "Numbers", col = "blue")

md$trend = rep(1:1000, length.out=nrow(md))

model1 <- lm(md$PureNumber ~ md$trend, data=md)

summary(model1)

plot(residuals(model1) , type = "l", ylab = "Res", col = "blue")

model2 <- lm(md$PureNumber ~ poly(md$trend,2), data=md)

summary(model2)

plot(residuals(model2) , type = "l", ylab = "Res", col = "blue")

model3 <- lm(md$PureNumber ~ poly(md$trend,3), data=md)

summary(model3)

plot(residuals(model3) , type = "l", ylab = "Res", col = "blue")

month <- as.numeric(format(md$strDate, "%m"))

md$month <- t(sapply(month, "==", c(1:12,0)))+0

md$month <-md$month[,-13]

dimnames(md$month) <- list(NULL, c("Jan", "Feb", "Mar", "Apr", "May", "June", "July", "Aug", "Sep", "Oct", "Nov", "Dec"))

model3 <- lm(md$PureNumber ~ poly(md$trend,2)+ md$month[,03] +md$month[,08], data=md)

summary(model3)

plot(residuals(model3) , type = "l", ylab = "Res", col = "blue")

AIC(model1)

BIC(model1)

AIC(model2)

BIC(model2)

AIC(model3)

BIC(model3)

acf(model1)

pacf(model1)

dwtest(model1)

acf(model2)

pacf(model2)

dwtest(model2)

acf(model3)

pacf(model3)

dwtest(model3)

fc1 <- predict(model1, h=24, se.fit = TRUE)

fc2 <- predict(model2, h=24, se.fit = TRUE)

fc3 <- predict(model3, h=24, se.fit = TRUE)

md$Number <- log(md$PureNumber)

model4 <- lm(md$Number ~ md$trend, data=md)

summary(model4)

plot(residuals(model4) , type = "l", ylab = "Res", col = "blue")

fc4 <- predict(model4, h=24, se.fit = TRUE)

fc4$forecast <- exp(fc4$fit)