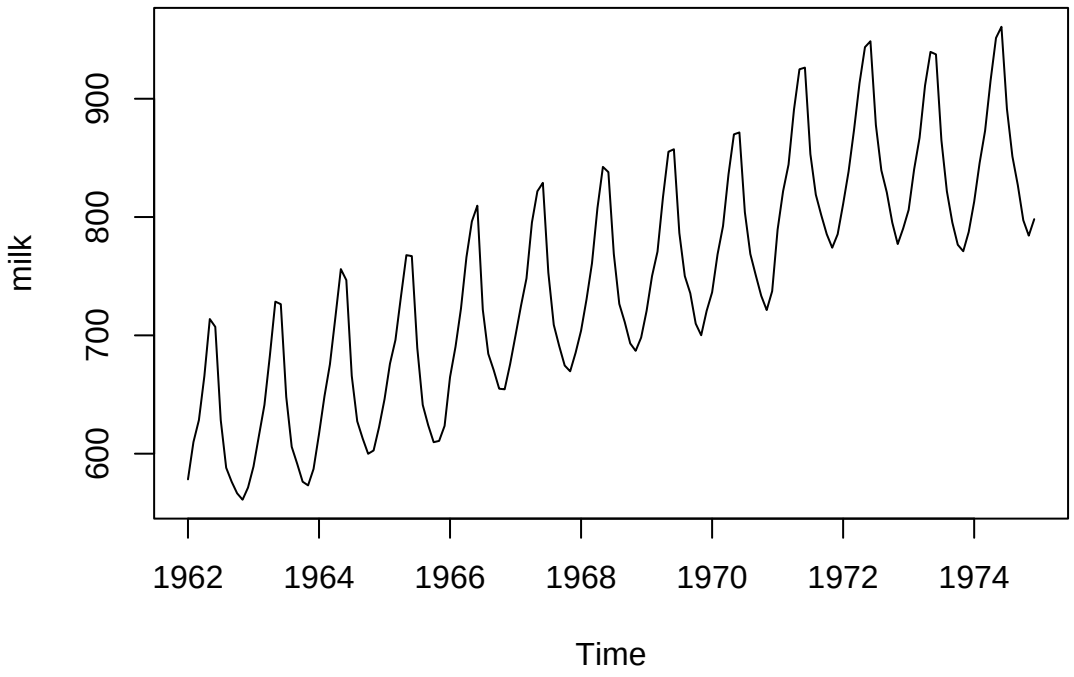
Lab Assignment 5

PSTAT W 174/274

1. We will analyze monthly milk production measured in pounds per from Jan. 1962 to Dec. 1975 from the package `tsdl` as Lab 4 (if you want to re-install `tsdl`, please refer to Lab 4). Let's denote the time series `milk` as X_t.

```
library(tsdl)
milk <- subset(tsdl, 12, "Agriculture")[[3]]
plot(milk)
```



(a) Explain why the series `milk` looks not stationary. To make series milk stationary, please difference at lag 12 and then at lag 1.

(b) Let Y_t be the series `ddmilk`, that is, $Y_t = (1 - B)(1 - B^{12})X_t$. Plot the ACF and PACF of Y_t with `lag.max = 50` and with `lag.max = 12`.

(c) Now, we assume that Y_t corresponds to a SARIMA model. Determine possible candidate models SARIMA$(p, d, q) \times (P, D, Q)_s$ for the series Y_t.

(d) Choose one stationary and invertible model for this data set, and write down your fitted model.