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1 rm(list=ls()) # Clear the Environment / History
2
3 set.seed(135343466) # <- fix the seed so the results are reproducible!
4 library(TSA)
5
6 # 1. (2 marks) The color dataset in the TSA package gives the values of a colour property
7 # from 35 consecutive batches in an industrial process. Suppose we decide to fit an AR(1)
8 # model to this dataset.
9 data(color)
10 # (a) Fit the AR(1) model to this dataset, using the Maximum Likelihood Estimation
11 # approach within the ar() function. Give the estimates of PI and MU.
12 # (Hint: We will need the argument method= "mle" in the ar( ) function.)
13 AR1.model.MLE = ar(color, order.max=1, AIC=F, method='mle')
14 AR1.model.MLE
15 #PI = 0.57
16
17 # Estimate of mu
18 AR1.model.MLE$x.mean
19 #mu = 74.34
20
21 # (b) Write out the full equation(s) you could use to estimate  $\sigma^2$ 
22 #  $e$ , using the estimates
23 # of PI and MU. Make sure to plug the estimates of PI and MU into the equation. You do
24 # not have to actually evaluate this estimate, since the dataset is somewhat large.
25
26 #  $Y_t - 74.34 = 0.57 * (Y_{t-1} - 74.34) + e_t$ ,
27 # where  $E(Y_t) = \mu$ .
28

```