Chapter 3 Problem 10

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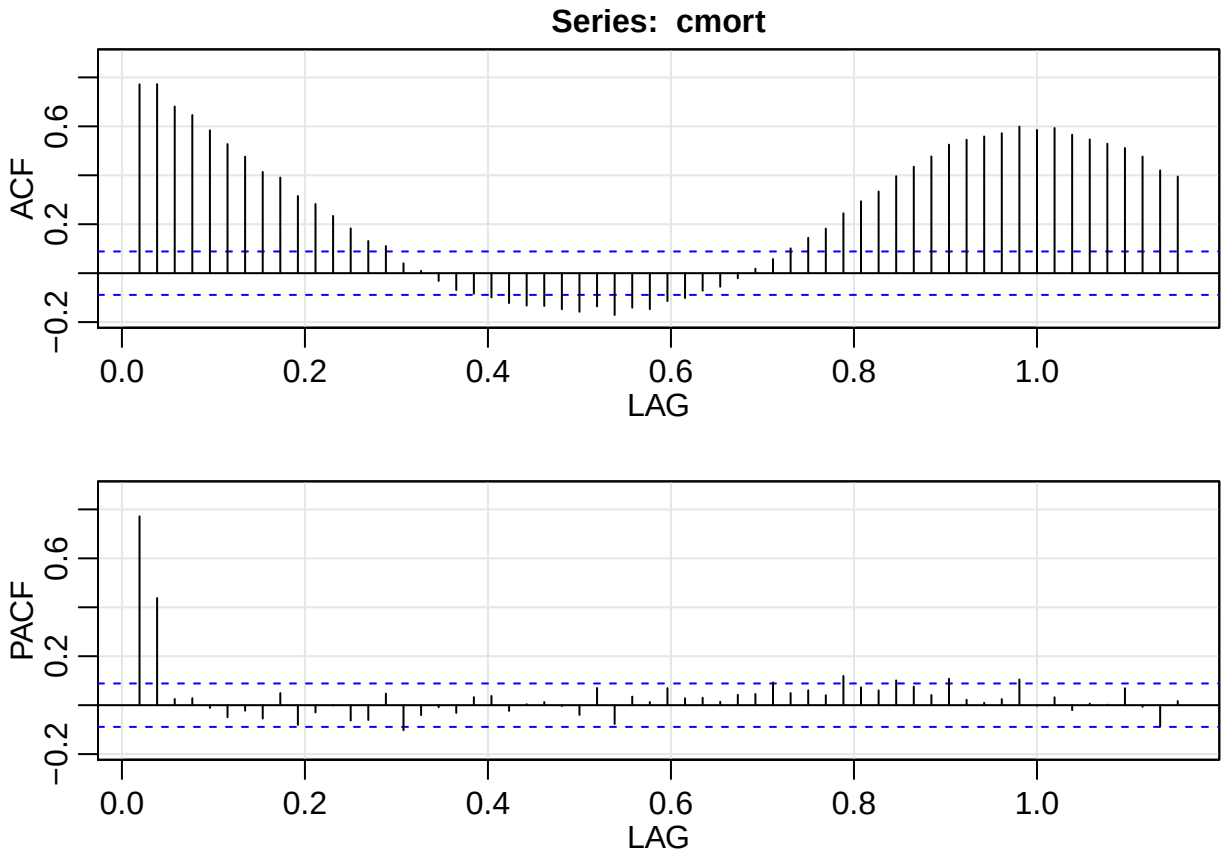
Let x_t represent the cardiovascular mortality series (`cmort`) discussed in Chapter 2, Example 2.2. Fit an AR(2) to x_t using linear regression as in Example 3.17. Assuming the fitted model is the true model, find the forecasts over a four-week horizon, x^n_{n+m}, for m = 1, 2, 3, 4, and the corresponding 95% prediction intervals.

```
library(astsa)
data(cmort)
acf2(cmort,60)
```




```
##          ACF  PACF
##  [1,]  0.77  0.77
##  [2,]  0.77  0.44
##  [3,]  0.68  0.03
##  [4,]  0.65  0.03
##  [5,]  0.58 -0.01
##  [6,]  0.53 -0.05
##  [7,]  0.48 -0.02
##  [8,]  0.41 -0.05
##  [9,]  0.39  0.05
## [10,]  0.32 -0.08
## [11,]  0.28 -0.03
## [12,]  0.23  0.00
## [13,]  0.18 -0.06
```

```
## [14,]  0.13 -0.06
## [15,]  0.11  0.05
## [16,]  0.04 -0.10
## [17,]  0.01 -0.04
## [18,] -0.03 -0.01
## [19,] -0.07 -0.03
## [20,] -0.08  0.03
## [21,] -0.10  0.04
## [22,] -0.12 -0.02
## [23,] -0.13  0.00
## [24,] -0.13  0.01
## [25,] -0.15  0.00
## [26,] -0.16 -0.04
## [27,] -0.14  0.07
## [28,] -0.17 -0.08
## [29,] -0.14  0.03
## [30,] -0.15  0.01
## [31,] -0.11  0.07
## [32,] -0.10  0.03
## [33,] -0.07  0.03
## [34,] -0.06  0.01
## [35,] -0.02  0.04
## [36,]  0.02  0.05
## [37,]  0.06  0.09
## [38,]  0.10  0.05
## [39,]  0.14  0.06
## [40,]  0.18  0.04
## [41,]  0.24  0.12
## [42,]  0.29  0.07
## [43,]  0.33  0.06
## [44,]  0.40  0.10
## [45,]  0.44  0.08
## [46,]  0.48  0.04
## [47,]  0.53  0.11
## [48,]  0.55  0.02
## [49,]  0.56  0.01
## [50,]  0.57  0.02
## [51,]  0.60  0.10
## [52,]  0.58  0.00
## [53,]  0.59  0.03
## [54,]  0.57 -0.02
## [55,]  0.55  0.01
## [56,]  0.53  0.00
## [57,]  0.51  0.07
## [58,]  0.48 -0.01
## [59,]  0.42 -0.09
## [60,]  0.39  0.02
```

```
regr = ar.ols(cmort,order=2, demean=FALSE, intercept=TRUE)
regr$asy.se.coef # standard errors of the estimates
```

```
## $x.mean
## [1] 2.393673
##
## $ar
```

```
## [1] 0.03979433 0.03976163
```