```r
#Q2: (2 marks) The retail dataset gives the monthly total retail sales (in billions of pounds) in the UK, from 1986 to 2007. The plot is shown below: Time


# (a) Fit the model using the code above. Show the table of parameter estimates you get as a result.
data(retail)
month. = season(retail)
month.retail = lm(retail ~ month.-1 + time(retail))
summary(month.retail)
```

```
> summary(month.retail)

Call:
lm(formula = retail ~ month. - 1 + time(retail))

Residuals:
     Min       1Q   Median       3Q      Max
-19.8950  -2.4440  -0.3518   2.1971  16.2045

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
month.January   -7.249e+03  8.724e+01  -83.10   <2e-16 ***
month.February  -7.252e+03  8.724e+01  -83.13   <2e-16 ***
month.March     -7.249e+03  8.725e+01  -83.09   <2e-16 ***
month.April     -7.246e+03  8.723e+01  -83.07   <2e-16 ***
month.May       -7.246e+03  8.723e+01  -83.07   <2e-16 ***
month.June      -7.246e+03  8.723e+01  -83.07   <2e-16 ***
month.July      -7.243e+03  8.724e+01  -83.03   <2e-16 ***
month.August    -7.246e+03  8.724e+01  -83.06   <2e-16 ***
month.September -7.246e+03  8.725e+01  -83.05   <2e-16 ***
month.October   -7.241e+03  8.725e+01  -82.99   <2e-16 ***
month.November  -7.229e+03  8.725e+01  -82.85   <2e-16 ***
month.December  -7.197e+03  8.726e+01  -82.48   <2e-16 ***
time(retail)     3.670e+00  4.369e-02   84.00   <2e-16 ***
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.278 on 242 degrees of freedom
Multiple R-squared:  0.9979,    Adjusted R-squared:  0.9978
F-statistic:  8791 on 13 and 242 DF,  p-value: < 2.2e-16
```

```r
# (b) what is the estimate of the mean trend at t = 1987:167? (Hint: First determine which month this corresponds to.)
# 1987.167 - 1986.000 = 1.167
# 1.167 / 0.083 = 14.0xx -> 14 months later from 1986 January -> 1987 March
#y = -7249 + 3.67 * 1987.167
#  = 43.90289
```