7) The observation with the highest leverage is the 21th observation and it is high leverage point since the leverage of 21th observation is 0.640685, which is bigger than 0.440678 based on the result of question 6. When comparing its explanatory variables with the explanatory variables of other points, we find that its explanatory variable TENURE is 41, which is relatively larger than other observations' TENURE. Also, its explanatory variable log(PROF) is 3.401197, which is relatively smaller than other observations' log(PROF). Thus, the TENURE and log(PROF) of this observation is extreme relative to these two explanatory variables of the other observations. This means that the number of years employed by the firm and the profits of the firm before taxes in millions of dollars of the 21th observation are extreme relative to these two explanatory variables of the other observations, which are the possible causes for why the observation with the highest leverage is 21th observation .

```
# 7)
highestindex <- which.max(hii)
highestindex
AGE
EDUCATN
bg
TENURE
EXPER
log(SALES)
log(VAL)
log(PCNTOWN)
log(PROF)
```

```
> # 7)
> highestindex <- which.max(hii)
> highestindex
21
21
> AGE
 [1] 59 50 61 59 62 55 63 37 47 61 54 65 56 47 62 63 71 64 62 51 64 60 56 60 57 60 60 55 51 56 48 57 60 50 74 57 51
[38] 60 60 64 49 62 64 55 55 53 59 56 60 63 50 60 64 45 60 64 62 54 52
> EDUCATN
 [1] 1 2 2 1 2 2 1 2 2 1 2 1 2 2 1 2 1 1 2 2 2 2 2 2 1 0 2 2 2 2 2 2 2 2 1 2 1 1 2 1 2 1 0 2 1 1 1 2 1 1 2 2 2 2 2 2
[57] 2 1 2
> bg
 [1] 2 5 2 5 5 2 5 1 1 2 1 5 3 1 5 5 1 5 3 3 4 4 2 3 2 5 1 1 2 3 3 1 1 3 1 4 2 3 4 4 1 3 3 1 5 2 5 5 5 5 1 1 4 5 3 1
[57] 4 2 5
Levels: 1 2 3 4 5
> TENURE
 [1] 37  4 24 34 25  2 14 11 21 41 28 29  5 14 30 36 46 28 13 16 41  9 33 36 29 42 36 11 17  2 17  3 37 27  3 27 23
[38] 38 36 39 18 37 28 30 32 31 38 30 36 41  5 30 15 11 34 39 34 31 12
```

```
> EXPER
 [1] 21.0  4.0 24.0  4.0  5.0  1.0 14.0  1.0  1.0 17.0 28.0 23.0  5.0  2.0  3.0  7.0 34.0 14.0  8.0  9.0  5.0  2.0
[23]  4.0  3.0  5.0  1.0  5.0 11.0 12.0  5.0  1.0  3.0 10.0  9.0  3.0 13.0  3.0 11.0 15.0 30.0  9.0 10.0 28.0  7.0
[45] 17.0  9.0  0.5  9.0 20.0  8.0  1.0  8.0 15.0 11.0 14.0 35.0 12.0 15.0  2.0
> log(SALES)
 [1] 8.064636 7.387709 6.543912 7.349874 9.033484 7.101676 8.544225 5.840642 6.785588 7.268920 8.094684 7.427144
[13] 7.696667 6.475433 6.505784 9.743143 6.727432 7.841886 7.843456 7.920810 8.400884 7.045777 9.841984 7.347300
[25] 9.198875 7.101676 7.858641 7.119636 6.759255 7.896925 7.338888 6.493754 8.432506 8.031710 6.163315 7.895808
[37] 6.359574 9.356344 8.399310 8.207947 8.529319 8.247220 6.738152 8.384119 9.445492 9.687506 9.862457 8.089176
[49] 9.027739 9.288967 6.988413 7.648263 7.336286 6.028279 9.612400 6.198479 7.765993 7.768956 9.968854
> log(VAL)
 [1]  5.1984970  0.1823216  2.7343675 -1.6094379  1.2237754  1.1314021  6.2807703  2.5572273  1.2809338  3.4210000
[11]  7.4318919  2.1860513 -0.3566749 -1.6094379  0.9555114  1.8405496  2.2617631  1.2237754 -1.2039728 -1.2039728
[21]  1.3862944 -1.2039728  1.5686159 -0.1053605  2.2721259  4.4496853  0.8754687  1.1939225  0.0000000  0.0000000
[31] -1.6094379  1.4109870  1.9315214  3.4372078 -2.3025851  0.3364722  1.9459101  5.7560586  0.6931472  3.8394523
[41]  0.2623643  1.2809338  5.3986151  0.7419373  3.5610461  1.4350845 -0.9162907  3.8979241  4.8865826  1.7749524
[51] -1.2039728 -0.3566749  0.6418539  0.9555114  2.4423470  3.7612001 -1.6094379  4.2682979  1.4350845
> log(PCNTOWN)
 [1]  1.90210753 -2.30258509 -0.05129329 -4.60517019 -3.21887582  0.19062036  1.38379123  1.42310833 -1.96611286
[10]  0.80200159  3.52753630 -0.11653382 -3.50655790 -3.91202301 -1.77195684 -3.21887582 -0.18632958 -1.56064775
[19] -4.60517019 -4.60517019 -3.21887582 -3.91202301 -3.50655790 -3.50655790 -1.66073121  2.87130220 -2.40794561
[28] -0.84397007 -2.30258509 -2.65926004 -4.60517019 -1.77195684 -0.99425227  0.59332685 -2.65926004 -3.50655790
[37] -0.18632958 -0.52763274 -3.21887582  0.92425890 -2.65926004 -2.99573227  1.38128182 -3.21887582 -1.23787436
[46] -2.40794561 -4.60517019 -0.38566248  2.10535292 -3.21887582 -3.50655790 -3.91202301 -2.12026354 -1.77195684
[55] -2.81341072  2.68716699 -4.60517019  2.31154483 -1.34707365
> log(PROF)
 [1] 4.912655 3.988984 3.951244 5.129899 6.692084 2.302585 5.517453 3.367296 4.927254 4.406719 5.758902 3.784190
[13] 5.411646 4.174387 4.394449 6.563856 4.595120 4.143135 5.723585 5.468060 3.401197 4.912655 6.848005 5.347108
[25] 5.849325 3.761200 5.442418 3.091042 4.727388 4.394449 5.241747 4.369448 5.010635 4.584967 1.791759 5.932245
[37] 4.406719 7.388946 6.033086 4.770685 2.639057 6.369901 4.510860 5.966147 6.572283 5.707110 6.224558 5.739793
[49] 4.406719 7.061334 3.988984 5.774552 4.976734 3.871201 6.752270 3.367296 5.579730 4.007333 4.615121
```