assignment

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```
asg_two_data=read.csv("https://raw.githubusercontent.com/abhirishisb/ISB_DAM/
master/cornwellrupert.csv")
asg_two_data$EXP2=asg_two_data$EXP^2
attach(asg_two_data)

#Model 1

M1=summary(lm(LWAGE~WKS+SOUTH))
M1

##
## Call:
## lm(formula = LWAGE ~ WKS + SOUTH)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.89477 -0.28550  0.01296  0.27659  1.95979
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.461187   0.064520 100.143  < 2e-16 ***
## WKS          0.005745   0.001370   4.195 2.78e-05 ***
## SOUTH       -0.185315   0.015474 -11.976  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4531 on 4162 degrees of freedom
## Multiple R-squared:  0.03662,    Adjusted R-squared:  0.03616
## F-statistic: 79.11 on 2 and 4162 DF,  p-value: < 2.2e-16

#Model 2
M2=summary(lm(LWAGE~WKS+SOUTH+SMSA+MS))
M2

##
## Call:
## lm(formula = LWAGE ~ WKS + SOUTH + SMSA + MS)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.85401 -0.28842  0.00999  0.26435  1.78547
##
```

```
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.106875   0.061563  99.197  < 2e-16 ***
## WKS          0.003528   0.001276   2.764  0.00573 **
## SOUTH       -0.139571   0.014544  -9.596  < 2e-16 ***
## SMSA         0.229891   0.013940  16.491  < 2e-16 ***
## MS           0.361632   0.016947  21.339  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4212 on 4160 degrees of freedom
## Multiple R-squared:  0.1678, Adjusted R-squared:  0.167
## F-statistic: 209.6 on 4 and 4160 DF,  p-value: < 2.2e-16

#Model 3
M3=summary(lm(LWAGE~WKS+SOUTH+SMSA+MS+EXP+EXP2))
M3

##
## Call:
## lm(formula = LWAGE ~ WKS + SOUTH + SMSA + MS + EXP + EXP2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.91843 -0.27706 -0.01287  0.26207  2.00249
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5.7615513  0.0631177  91.283  < 2e-16 ***
## WKS          0.0035068  0.0012380   2.833  0.00464 **
## SOUTH       -0.1344707  0.0140917  -9.543  < 2e-16 ***
## SMSA         0.2246981  0.0135314  16.606  < 2e-16 ***
## MS           0.3200650  0.0166714  19.198  < 2e-16 ***
## EXP          0.0377823  0.0025072  15.069  < 2e-16 ***
## EXP2        -0.0007154  0.0000552 -12.961  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4079 on 4158 degrees of freedom
## Multiple R-squared:  0.2201, Adjusted R-squared:  0.219
## F-statistic: 195.6 on 6 and 4158 DF,  p-value: < 2.2e-16

#Model 4
M4=summary(lm(LWAGE~WKS+SOUTH+SMSA+MS+EXP+EXP2+OCC+IND+UNION))
M4

##
## Call:
## lm(formula = LWAGE ~ WKS + SOUTH + SMSA + MS + EXP + EXP2 + OCC +
##     IND + UNION)
##
```

```
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.03101 -0.25501 -0.00924  0.24810  2.17443
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5.880e+00  6.035e-02  97.428  < 2e-16 ***
## WKS          4.461e-03  1.180e-03   3.780 0.000159 ***
## SOUTH       -1.137e-01  1.345e-02  -8.453  < 2e-16 ***
## SMSA         1.586e-01  1.303e-02  12.173  < 2e-16 ***
## MS           3.203e-01  1.585e-02  20.213  < 2e-16 ***
## EXP          3.611e-02  2.357e-03  15.318  < 2e-16 ***
## EXP2        -6.550e-04  5.186e-05 -12.629  < 2e-16 ***
## OCC         -3.176e-01  1.349e-02 -23.538  < 2e-16 ***
## IND          3.213e-02  1.277e-02   2.516 0.011894 *
## UNION        6.975e-02  1.392e-02   5.009 5.69e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3823 on 4155 degrees of freedom
## Multiple R-squared:  0.3155, Adjusted R-squared:  0.314
## F-statistic: 212.7 on 9 and 4155 DF,  p-value: < 2.2e-16

#Model 5
M5=summary(lm(LWAGE~WKS+SOUTH+SMSA+MS+EXP+EXP2+OCC+IND+UNION+FEM+BLK+ED))
M5

##
## Call:
## lm(formula = LWAGE ~ WKS + SOUTH + SMSA + MS + EXP + EXP2 + OCC +
##     IND + UNION + FEM + BLK + ED)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.18965 -0.23536 -0.00988  0.22906  2.08738
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5.251e+00  7.129e-02  73.662  < 2e-16 ***
## WKS          4.216e-03  1.081e-03   3.899 9.82e-05 ***
## SOUTH       -5.564e-02  1.253e-02  -4.441 9.17e-06 ***
## SMSA         1.517e-01  1.207e-02  12.567  < 2e-16 ***
## MS           4.845e-02  2.057e-02   2.355   0.0185 *
## EXP          4.010e-02  2.159e-03  18.574  < 2e-16 ***
## EXP2        -6.734e-04  4.744e-05 -14.193  < 2e-16 ***
## OCC         -1.400e-01  1.466e-02  -9.553  < 2e-16 ***
## IND          4.679e-02  1.179e-02   3.967 7.39e-05 ***
## UNION        9.263e-02  1.280e-02   7.237 5.45e-13 ***
## FEM         -3.678e-01  2.510e-02 -14.655  < 2e-16 ***
## BLK         -1.669e-01  2.204e-02  -7.574 4.45e-14 ***
```

```
## ED           5.670e-02  2.613e-03  21.702  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3494 on 4152 degrees of freedom
## Multiple R-squared:  0.4286, Adjusted R-squared:  0.427
## F-statistic: 259.5 on 12 and 4152 DF,  p-value: < 2.2e-16
```

```
coef(M1);coef(M2);coef(M3);coef(M4);coef(M5)
```

```
##                 Estimate  Std. Error    t value     Pr(>|t|)
## (Intercept)  6.461187165 0.064519599 100.143014 0.000000e+00
## WKS          0.005745418 0.001369539   4.195149 2.783742e-05
## SOUTH       -0.185315087 0.015474363 -11.975620 1.622788e-32
```

```
##                 Estimate  Std. Error   t value     Pr(>|t|)
## (Intercept)  6.106874998 0.061563021 99.197131 0.000000e+00
## WKS          0.003528445 0.001276383  2.764409 5.727712e-03
## SOUTH       -0.139570804 0.014544428 -9.596170 1.385991e-21
## SMSA         0.229890711 0.013940195 16.491212 3.101809e-59
## MS           0.361632118 0.016947082 21.338902 5.795231e-96
```

```
##                  Estimate   Std. Error    t value     Pr(>|t|)
## (Intercept)  5.7615513131 6.311768e-02  91.282690 0.000000e+00
## WKS          0.0035068213 1.238005e-03   2.832640 4.638759e-03
## SOUTH       -0.1344707314 1.409166e-02  -9.542575 2.302148e-21
## SMSA         0.2246980989 1.353144e-02  16.605629 5.226222e-60
## MS           0.3200649489 1.667138e-02  19.198469 8.918210e-79
## EXP          0.0377823146 2.507234e-03  15.069323 5.273898e-50
## EXP2        -0.0007154264 5.519902e-05 -12.960852 1.085721e-37
```

```
##                  Estimate   Std. Error    t value      Pr(>|t|)
## (Intercept)  5.8802364337 6.035439e-02  97.428474  0.000000e+00
## WKS          0.0044612967 1.180097e-03   3.780449  1.587436e-04
## SOUTH       -0.1136763426 1.344857e-02  -8.452672  3.890145e-17
## SMSA         0.1585789272 1.302696e-02  12.173136  1.598596e-33
## MS           0.3203284434 1.584772e-02  20.212905  9.840807e-87
## EXP          0.0361095011 2.357291e-03  15.318219  1.446948e-51
## EXP2        -0.0006550021 5.186458e-05 -12.629083  6.616108e-36
## OCC         -0.3176203748 1.349408e-02 -23.537754 4.202888e-115
## IND          0.0321346501 1.277024e-02   2.516371  1.189442e-02
## UNION        0.0697536098 1.392442e-02   5.009444  5.685524e-07
```

```
##                 Estimate   Std. Error    t value     Pr(>|t|)
## (Intercept)  5.251123587 7.128679e-02  73.661941 0.000000e+00
## WKS          0.004216089 1.081366e-03   3.898854 9.817530e-05
## SOUTH       -0.055637368 1.252710e-02  -4.441359 9.171786e-06
## SMSA         0.151667119 1.206870e-02  12.566976 1.413822e-35
## MS           0.048448508 2.056867e-02   2.355452 1.854646e-02
## EXP          0.040104650 2.159175e-03  18.574060 4.833740e-74
## EXP2        -0.000673377 4.744313e-05 -14.193353 1.100270e-44
```

```
## OCC          -0.140009344 1.465670e-02  -9.552583 2.096044e-21
## IND           0.046788640 1.179350e-02   3.967324 7.391049e-05
## UNION         0.092626749 1.279951e-02   7.236742 5.447452e-13
## FEM          -0.367785217 2.509705e-02 -14.654519 1.894250e-47
## BLK          -0.166937634 2.204219e-02  -7.573550 4.449422e-14
## ED            0.056704208 2.612826e-03  21.702252 5.134073e-99

cbind(M1$r.squared,M2$r.squared,M3$r.squared,M4$r.squared,M5$r.squared)

##            [,1]      [,2]      [,3]      [,4]      [,5]
## [1,] 0.03662265 0.1677582 0.2201472 0.3154548 0.4286133

cbind(M1$fstatistic,M2$fstatistic,M3$fstatistic,M4$fstatistic,M5$fstatistic)

##              [,1]      [,2]      [,3]      [,4]      [,5]
## value   79.10892  209.6368  195.6292  212.7471  259.5444
## numdf    2.00000    4.0000    6.0000    9.0000   12.0000
## dendf 4162.00000 4160.0000 4158.0000 4155.0000 4152.0000
```