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