ISyE6416HW2

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```r
pricing <- glm(Price ~ factor(Location) + MLS + factor(Bedrooms) + factor(Bathrooms) + Size +
               Price.SQ.Ft, data = house)
summary(pricing)
```

```
##
## Call:
## glm(formula = Price ~ factor(Location) + MLS + factor(Bedrooms) +
##     factor(Bathrooms) + Size + Price.SQ.Ft, data = house)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -717494   -23544     3256    30639  1846488
##
## Coefficients: (1 not defined because of singularities)
##                                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      -7.970e+05  2.292e+05  -3.476 0.000539 ***
## factor(Location) Atascadero      -2.580e+05  5.480e+04  -4.707 3.02e-06 ***
## factor(Location) Bradley          4.551e+04  1.323e+05   0.344 0.730892
## factor(Location) Cambria         -1.345e+05  5.296e+04  -2.539 0.011317 *
## factor(Location) Cayucos         -2.663e+05  9.635e+04  -2.764 0.005858 **
## factor(Location) Creston         -2.277e+05  1.308e+05  -1.741 0.082094 .
## factor(Location) Grover Beach    -2.080e+05  9.622e+04  -2.162 0.030960 *
## factor(Location) Lompoc          -1.060e+05  1.331e+05  -0.797 0.425920
## factor(Location) Los Osos        -1.358e+05  6.342e+04  -2.141 0.032616 *
## factor(Location) Morro Bay       -2.300e+05  7.276e+04  -3.161 0.001641 **
## factor(Location) Nipomo          -1.100e+05  8.237e+04  -1.335 0.182267
## factor(Location) Oceano          -1.071e+06  1.419e+05  -7.550 1.34e-13 ***
## factor(Location) Out Of Area     -4.825e+04  1.341e+05  -0.360 0.719174
## factor(Location) Paso Robles     -2.064e+05  4.967e+04  -4.154 3.66e-05 ***
## factor(Location) Pismo Beach     -2.460e+05  5.763e+04  -4.269 2.23e-05 ***
## factor(Location) San Luis Obispo  5.313e+04  8.779e+04   0.605 0.545252
## factor(Location) San Miguel      -1.845e+05  1.312e+05  -1.406 0.160074
## factor(Location) Santa Maria-Orcutt -1.558e+05  5.178e+04  -3.009 0.002718 **
## factor(Location) Solvang         -1.646e+05  9.674e+04  -1.701 0.089383 .
## factor(Location) Templeton       -1.994e+05  1.309e+05  -1.523 0.128216
## factor(Location)Arroyo Grande    -2.117e+05  4.459e+04  -4.748 2.49e-06 ***
## factor(Location)Atascadero       -1.942e+05  4.158e+04  -4.672 3.58e-06 ***
## factor(Location)Avila Beach      -4.375e+05  8.368e+04  -5.229 2.25e-07 ***
## factor(Location)Bakersfield      -8.860e+04  1.322e+05  -0.670 0.503038
## factor(Location)Bradley          -4.178e+05  8.394e+04  -4.977 8.11e-07 ***
## factor(Location)Buellton         -2.042e+05  5.258e+04  -3.883 0.000113 ***
## factor(Location)Cambria          -3.146e+05  5.650e+04  -5.568 3.66e-08 ***
## factor(Location)Cayucos           1.243e+05  1.332e+05   0.933 0.351256
## factor(Location)Coalinga         -1.265e+05  6.224e+04  -2.032 0.042562 *
## factor(Location)Creston          -1.788e+05  1.315e+05  -1.359 0.174447
## factor(Location)Greenfield       -1.772e+05  1.322e+05  -1.341 0.180319
## factor(Location)Grover Beach     -2.221e+05  4.680e+04  -4.745 2.53e-06 ***
```

```
## factor(Location)Guadalupe         -6.532e+04  7.556e+04  -0.865 0.387601
## factor(Location)King City         -1.962e+05  8.382e+04  -2.341 0.019525 *
## factor(Location)Lockwood          -2.237e+05  1.311e+05  -1.707 0.088352 .
## factor(Location)Lompoc            -1.565e+05  4.620e+04  -3.387 0.000746 ***
## factor(Location)Los Alamos        -1.938e+05  8.298e+04  -2.336 0.019775 *
## factor(Location)Los Osos          -1.756e+05  4.747e+04  -3.700 0.000232 ***
## factor(Location)Morro Bay         -1.760e+05  5.255e+04  -3.348 0.000855 ***
## factor(Location)New Cuyama        -2.620e+04  1.341e+05  -0.195 0.845202
## factor(Location)Nipomo            -1.819e+05  4.371e+04  -4.160 3.56e-05 ***
## factor(Location)Oceano            -1.448e+05  5.518e+04  -2.624 0.008882 **
## factor(Location)Out Of Area       -1.330e+05  8.284e+04  -1.606 0.108775
## factor(Location)Paso Robles       -1.842e+05  4.086e+04  -4.508 7.64e-06 ***
## factor(Location)Pismo Beach       -2.749e+05  5.341e+04  -5.146 3.44e-07 ***
## factor(Location)San Luis Obispo   -2.228e+05  5.054e+04  -4.409 1.20e-05 ***
## factor(Location)San Miguel        -1.626e+05  5.147e+04  -3.158 0.001654 **
## factor(Location)San Simeon        -1.783e+05  1.316e+05  -1.355 0.175888
## factor(Location)Santa Margarita    1.109e+05  1.388e+05   0.799 0.424700
## factor(Location)Santa Maria-Orcutt -1.548e+05  4.031e+04  -3.840 0.000134 ***
## factor(Location)Santa Ynez        -1.513e+05  6.781e+04  -2.232 0.025935 *
## factor(Location)Soledad           -1.458e+05  8.361e+04  -1.744 0.081532 .
## factor(Location)Solvang           -2.076e+05  5.815e+04  -3.570 0.000381 ***
## factor(Location)Templeton         -2.551e+05  5.352e+04  -4.766 2.28e-06 ***
## MLS                                8.646e-01  1.290e+00   0.670 0.502935
## factor(Bedrooms)1                  2.810e+05  1.012e+05   2.776 0.005640 **
## factor(Bedrooms)2                  3.744e+05  9.476e+04   3.951 8.56e-05 ***
## factor(Bedrooms)3                  3.948e+05  9.529e+04   4.143 3.84e-05 ***
## factor(Bedrooms)4                  3.763e+05  9.644e+04   3.902 0.000105 ***
## factor(Bedrooms)5                  3.302e+05  1.003e+05   3.291 0.001048 **
## factor(Bedrooms)6                  3.753e+05  1.182e+05   3.176 0.001558 **
## factor(Bedrooms)7                 -2.873e+05  1.689e+05  -1.701 0.089335 .
## factor(Bedrooms)10                 1.779e+05  1.637e+05   1.087 0.277505
## factor(Bathrooms)2                 1.644e+04  2.056e+04   0.799 0.424287
## factor(Bathrooms)3                 1.418e+04  2.425e+04   0.585 0.558871
## factor(Bathrooms)4                 9.710e+04  3.695e+04   2.628 0.008776 **
## factor(Bathrooms)5                 6.234e+05  6.528e+04   9.550  < 2e-16 ***
## factor(Bathrooms)6                 2.911e+05  1.051e+05   2.768 0.005782 **
## factor(Bathrooms)7                 8.753e+04  1.102e+05   0.794 0.427449
## factor(Bathrooms)11                       NA         NA      NA       NA
## Size                               2.226e+02  1.072e+01  20.766  < 2e-16 ***
## Price.SQ.Ft                        2.015e+03  6.665e+01  30.235  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 15749018962)
##
##     Null deviance: 9.5026e+13  on 780  degrees of freedom
## Residual deviance: 1.1182e+13  on 710  degrees of freedom
## AIC: 20624
##
## Number of Fisher Scoring iterations: 2
```

After running glm on categorical and continuous variables, we could infer some of useful Our model is $Price = \beta_0 + \beta_1 MLS + \beta_2 Bedrooms + \beta_3 Bathrooms + \beta_4 Size + \beta_5 Price.SQ.Ft+$ different location with different coeeficients. From the above output, if the p-value (***) of each categorical is greater than critical

region. That is, we will think this location has influence on house price. And for the number of bathrooms or bedrooms, 5 bathrooms, 2 bedrooms to 4 bedrooms have influence on house price. As for other continuous varibles, we could clearly see size and price.sq.ft has stronger imapct on price. Furthermore, after searching these locations, we could easily find if the location is city, those p-values are possibly less than critical region. And most of locations is near ocean.