Project 1 - Animal Crossing

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Importing data sets

```
df <- read.csv("D:/College/DSC680/Project 1/df_ordinal.csv")
df2 <- read.csv("D:/College/DSC680/Project 1/df_dummy.csv")
```

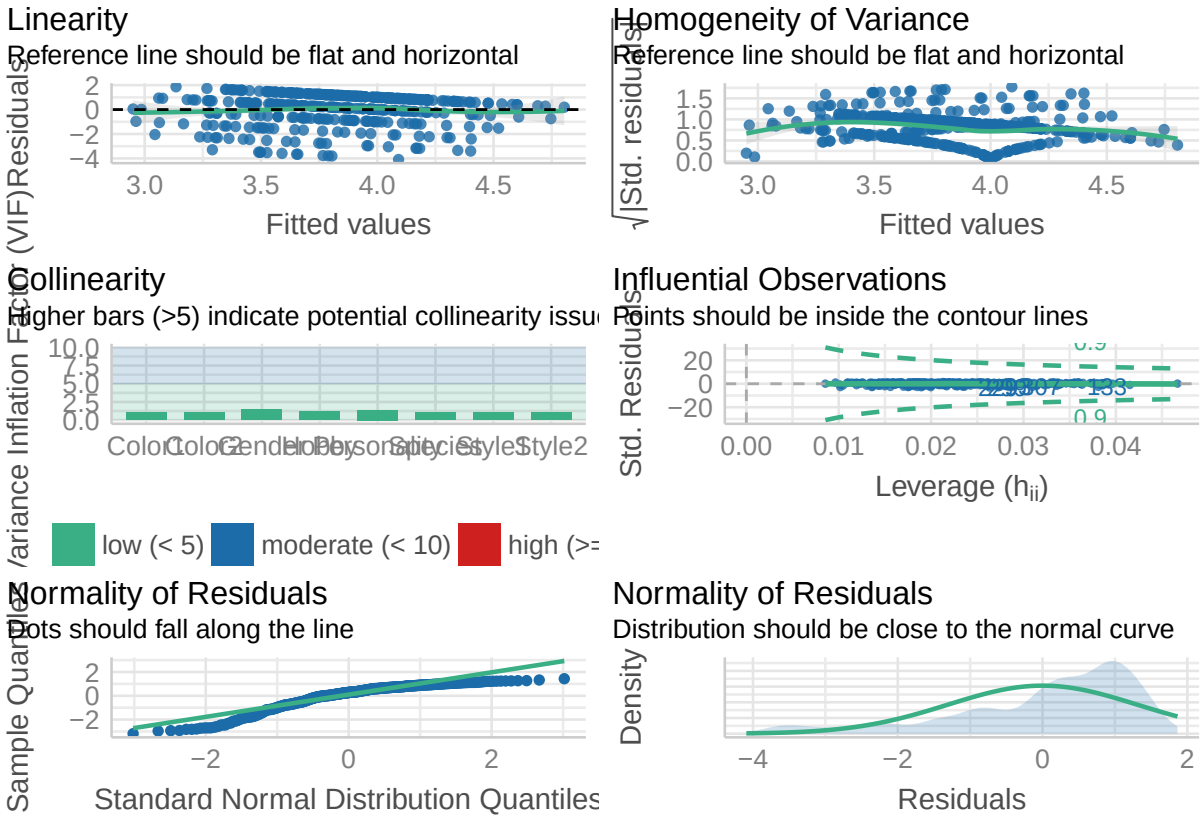
Regression Models

Regression using ordinal encoded data set

```
##
## Call:
## lm(formula = Tier ~ Species + Gender + Personality + Hobby +
##     Style1 + Style2 + Color1 + Color2, data = df)
##
## Coefficients:
## (Intercept)      Species       Gender  Personality        Hobby       Style1
##   3.8904550   -0.0026600    0.4908682    0.0366485   -0.1504016   -0.0644005
##      Style2       Color1       Color2
##  -0.0247950    0.0348579    0.0003534

## # R2 for Linear Regression
##        R2: 0.064
##   adj. R2: 0.045

## # Indices of model performance
##
## AIC      |      BIC |    R2 | R2 (adj.) |  RMSE | Sigma
## ----------------------------------------------------------
## 1335.851 | 1375.538 | 0.064 |     0.045 | 1.302 | 1.317
```



Regression using dummy encoded data set

```
##
## Call:
## lm(formula = Tier_x ~ Species_Alligator + Species_Anteater +
##     Species_Bear + Species_Bird + Species_Bull + Species_Cat +
##     Species_Chicken + Species_Cow + Species_Cub + Species_Deer +
##     Species_Dog + Species_Duck + Species_Eagle + Species_Elephant +
##     Species_Frog + Species_Goat + Species_Gorilla + Species_Hamster +
##     Species_Hippo + Species_Horse + Species_Kangaroo + Species_Koala +
##     Species_Lion + Species_Monkey + Species_Mouse + Species_Octopus +
##     Species_Ostrich + Species_Penguin + Species_Pig + Species_Rabbit +
##     Species_Rhino + Species_Sheep + Species_Squirrel + Species_Tiger +
##     Species_Wolf + Gender_Female + Gender_Male + Personality_Big.Sister +
##     Personality_Cranky + Personality_Jock + Personality_Lazy +
##     Personality_Normal + Personality_Peppy + Personality_Smug +
##     Personality_Snooty + Hobby_Education + Hobby_Fashion + Hobby_Fitness +
##     Hobby_Music + Hobby_Nature + Hobby_Play + Style.1_Active +
##     Style.1_Cool + Style.1_Cute + Style.1_Elegant + Style.1_Gorgeous +
##     Style.1_Simple + Style.2_Active + Style.2_Cool + Style.2_Cute +
##     Style.2_Elegant + Style.2_Gorgeous + Style.2_Simple + Color.1_Beige +
##     Color.1_Black + Color.1_Blue + Color.1_Brown + Color.1_Colorful +
##     Color.1_Gray + Color.1_Green + Color.1_Light.blue + Color.1_Orange +
##     Color.1_Pink + Color.1_Purple + Color.1_Red + Color.1_White +
##     Color.1_Yellow + Color.2_Beige + Color.2_Black + Color.2_Blue +
##     Color.2_Brown + Color.2_Colorful + Color.2_Gray + Color.2_Green +
```

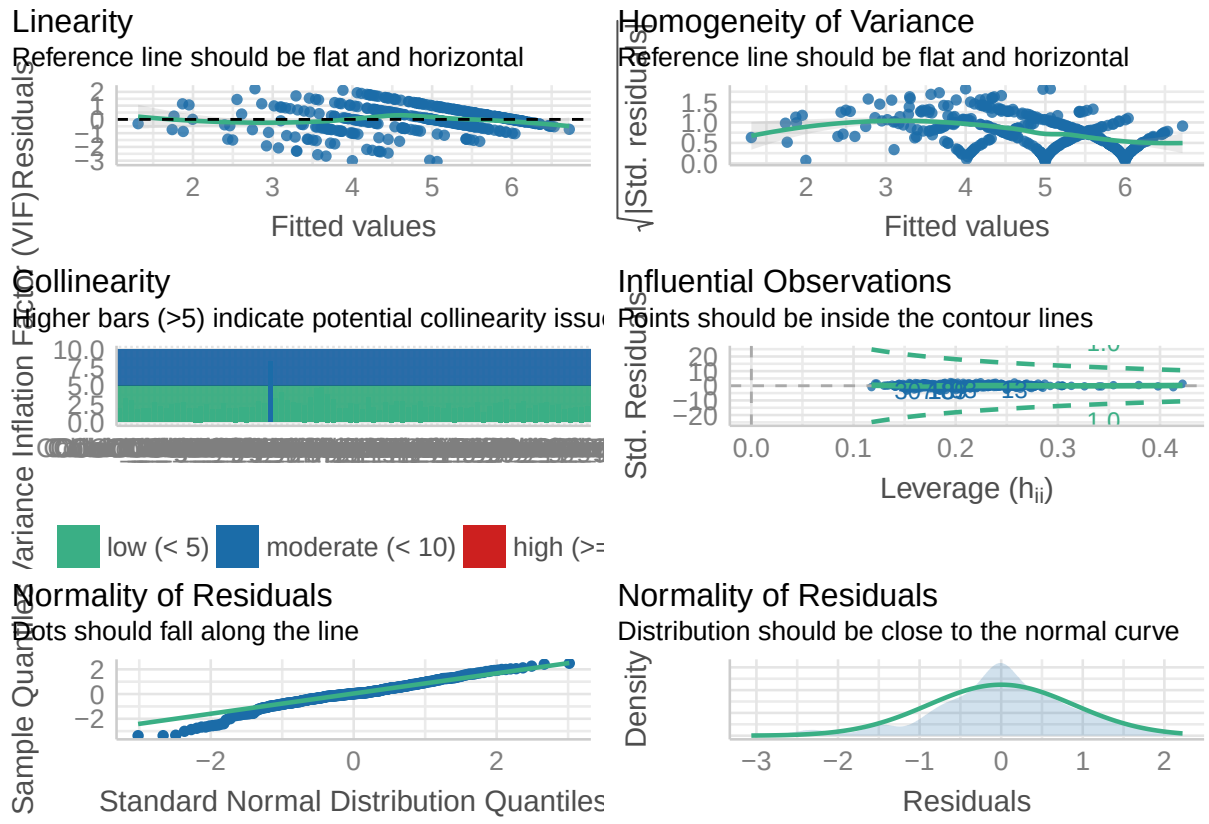
```
##     Color.2_Light.blue + Color.2_Orange + Color.2_Pink + Color.2_Purple +
##     Color.2_Red + Color.2_White + Color.2_Yellow + Species +
##     Gender + Personality + Hobby + Style.1 + Style.2 + Color.1 +
##     Color.2, data = df2)
##
## Coefficients:
##            (Intercept)       Species_Alligator        Species_Anteater
##               2.728449               2.070165               2.421760
##           Species_Bear           Species_Bird           Species_Bull
##               2.551394               2.598045               2.556872
##            Species_Cat        Species_Chicken            Species_Cow
##               0.374662               2.705822               2.724388
##            Species_Cub           Species_Deer            Species_Dog
##               1.332584               0.180023               1.243010
##           Species_Duck          Species_Eagle       Species_Elephant
##               2.031863               2.080180               2.130552
##           Species_Frog           Species_Goat        Species_Gorilla
##               2.004999               0.994815               2.829632
##        Species_Hamster          Species_Hippo          Species_Horse
##               1.708630               2.813326               1.974066
##       Species_Kangaroo          Species_Koala           Species_Lion
##               2.792055               2.102424               2.674064
##         Species_Monkey          Species_Mouse        Species_Octopus
##               2.393619               2.677553              -0.567224
##        Species_Ostrich        Species_Penguin            Species_Pig
##               1.853654               1.675947               2.700840
##         Species_Rabbit          Species_Rhino          Species_Sheep
##               1.719537               1.597957               1.406907
##       Species_Squirrel          Species_Tiger           Species_Wolf
##               1.390678               2.348107                     NA
##          Gender_Female            Gender_Male  Personality_Big.Sister
##               0.495072                     NA              -0.589871
##     Personality_Cranky       Personality_Jock       Personality_Lazy
##               0.327315               0.044348               0.325008
##     Personality_Normal      Personality_Peppy       Personality_Smug
##               0.033590              -0.224618                     NA
##     Personality_Snooty        Hobby_Education          Hobby_Fashion
##                     NA               0.195844               0.706014
##          Hobby_Fitness           Hobby_Music           Hobby_Nature
##              -0.119789               0.071133              -0.010461
##             Hobby_Play         Style.1_Active           Style.1_Cool
##                     NA               0.494841               0.035698
##           Style.1_Cute        Style.1_Elegant       Style.1_Gorgeous
##              -0.721030              -0.412348              -0.001066
##         Style.1_Simple         Style.2_Active           Style.2_Cool
##                     NA               0.226693               0.328003
##           Style.2_Cute        Style.2_Elegant       Style.2_Gorgeous
##              -0.813865               0.098712               0.383250
##         Style.2_Simple          Color.1_Beige          Color.1_Black
##                     NA              -0.849680              -0.572373
##           Color.1_Blue          Color.1_Brown       Color.1_Colorful
##               0.077205              -0.094731              -0.266459
##           Color.1_Gray          Color.1_Green     Color.1_Light.blue
##               0.070819               0.114690              -0.318804
```

```
##         Color.1_Orange           Color.1_Pink         Color.1_Purple
##              -0.019470              -0.003583               0.091552
##            Color.1_Red          Color.1_White         Color.1_Yellow
##               0.238145              -0.487561                     NA
##          Color.2_Beige          Color.2_Black           Color.2_Blue
##               0.277570              -0.222363              -0.222533
##          Color.2_Brown       Color.2_Colorful           Color.2_Gray
##              -0.022671               0.259606               0.485957
##          Color.2_Green     Color.2_Light.blue          Color.2_Orange
##               0.159663              -0.144513               0.317648
##           Color.2_Pink         Color.2_Purple            Color.2_Red
##              -0.227494              -0.005937               0.088630
##          Color.2_White         Color.2_Yellow       SpeciesAnteater
##              -0.002148                     NA                     NA
##            SpeciesBear            SpeciesBird            SpeciesBull
##                     NA                     NA                     NA
##             SpeciesCat          SpeciesChicken             SpeciesCow
##                     NA                     NA                     NA
##             SpeciesCub            SpeciesDeer             SpeciesDog
##                     NA                     NA                     NA
##            SpeciesDuck           SpeciesEagle        SpeciesElephant
##                     NA                     NA                     NA
##            SpeciesFrog            SpeciesGoat         SpeciesGorilla
##                     NA                     NA                     NA
##         SpeciesHamster           SpeciesHippo           SpeciesHorse
##                     NA                     NA                     NA
##       SpeciesKangaroo           SpeciesKoala             SpeciesLion
##                     NA                     NA                     NA
##          SpeciesMonkey           SpeciesMouse         SpeciesOctopus
##                     NA                     NA                     NA
##         SpeciesOstrich         SpeciesPenguin              SpeciesPig
##                     NA                     NA                     NA
##           SpeciesRabbit            SpeciesRhino           SpeciesSheep
##                     NA                     NA                     NA
##       SpeciesSquirrel            SpeciesTiger             SpeciesWolf
##                     NA                     NA                     NA
##            GenderMale       PersonalityCranky         PersonalityJock
##                     NA                     NA                     NA
##       PersonalityLazy       PersonalityNormal        PersonalityPeppy
##                     NA                     NA                     NA
##       PersonalitySmug       PersonalitySnooty          HobbyFashion
##                     NA                     NA                     NA
##          HobbyFitness             HobbyMusic           HobbyNature
##                     NA                     NA                     NA
##           HobbyPlay            Style.1Cool            Style.1Cute
##                     NA                     NA                     NA
##         Style.1Elegant         Style.1Gorgeous          Style.1Simple
##                     NA                     NA                     NA
##          Style.2Cool            Style.2Cute         Style.2Elegant
##                     NA                     NA                     NA
##       Style.2Gorgeous          Style.2Simple           Color.1Black
##                     NA                     NA                     NA
##           Color.1Blue           Color.1Brown        Color.1Colorful
##                     NA                     NA                     NA
```

```
##            Color.1Gray           Color.1Green      Color.1Light blue
##                     NA                     NA                     NA
##          Color.1Orange            Color.1Pink          Color.1Purple
##                     NA                     NA                     NA
##             Color.1Red           Color.1White          Color.1Yellow
##                     NA                     NA                     NA
##           Color.2Black            Color.2Blue           Color.2Brown
##                     NA                     NA                     NA
##        Color.2Colorful           Color.2Gray           Color.2Green
##                     NA                     NA                     NA
##      Color.2Light blue          Color.2Orange            Color.2Pink
##                     NA                     NA                     NA
##          Color.2Purple             Color.2Red           Color.2White
##                     NA                     NA                     NA
##          Color.2Yellow
##                     NA
```

```
## # R2 for Linear Regression
##        R2: 0.562
##   adj. R2: 0.446
```

```
## # Indices of model performance
##
## AIC      |      BIC |    R2 | R2 (adj.) |  RMSE | Sigma
## ----------------------------------------------------------
## 1186.766 | 1520.137 | 0.562 |     0.446 | 0.890 | 1.003
```



Compare Performance

```
## Warning: When comparing models, please note that probably not all models were fit from
##   same data.

## # Comparison of Model Performance Indices
##
## Name | Model |      AIC |  AIC_wt |      BIC |  BIC_wt |    R2 | R2 (adj.) |  RMSE | Sigma
## ---------------------------------------------------------------------------------------
## reg  |    lm | 1335.851 | < 0.001 | 1375.538 |    1.00 | 0.064 |     0.045 | 1.302 | 1.317
## reg2 |    lm | 1186.766 |    1.00 | 1520.137 | < 0.001 | 0.562 |     0.446 | 0.890 | 1.003
```