uhuru dataset

2022-10-04

1. Describing the data that we are using

we are using the dataset from this study

2. reading the data table into R

First make sure we are in the correct working directory "getwd()" "/Users/atziri/Bio 195-197/Data Science"

if it is not right set the working directory with 'setwd()'

```
read.csv(file = "/Users/atziri/Bio 195-197/Data Science/raw-data/ACACIA_DREPANOLOBIUM_SURVEY.txt", sep
```

```
##       SURVEY YEAR   SITE BLOCK TREATMENT    PLOT    ID HEIGHT AXIS1 AXIS2 CIRC
## 1          1 2012 SOUTH     1     TOTAL S1TOTAL   581   2.25  2.75  2.15 20.0
## 2          1 2012 SOUTH     1     TOTAL S1TOTAL   582   2.65  4.10  3.90 28.0
## 3          1 2012 SOUTH     1     TOTAL S1TOTAL  3111    1.5  1.70  0.85 17.0
## 4          1 2012 SOUTH     1     TOTAL S1TOTAL  3112   2.01  1.80  1.60 12.0
## 5          1 2012 SOUTH     1     TOTAL S1TOTAL  3113   1.75  1.84  1.42 13.0
## 6          1 2012 SOUTH     1     TOTAL S1TOTAL  3114   1.65  1.62  0.85 15.0
## 7          1 2012 SOUTH     1     TOTAL S1TOTAL  3115    1.2  1.95  0.90  9.0
## 8          1 2012 SOUTH     1     TOTAL S1TOTAL  3199   1.45  2.00  1.75 12.2
## 9          1 2012 SOUTH     1      MESO   S1MESO   941   1.87  2.15  1.82 13.0
## 10         1 2012 SOUTH     1      MESO   S1MESO   942   2.38  5.55  4.82 35.0
## 11         1 2012 SOUTH     1      MESO   S1MESO   943   2.58  4.90  4.24 24.0
## 12         1 2012 SOUTH     1      MESO   S1MESO   944   2.65  3.75  3.10 27.0
## 13         1 2012 SOUTH     1      MESO   S1MESO   946   2.35  2.34  2.05 20.0
## 14         1 2012 SOUTH     1      MESO   S1MESO   947   1.88  2.10  1.85 28.0
## 15         1 2012 SOUTH     1      MESO   S1MESO  3116   2.32  3.05  2.63 30.0
## 16         1 2012 SOUTH     1      MESO   S1MESO  3117   2.39  2.21  2.10 13.0
## 17         1 2012 SOUTH     1      MESO   S1MESO  3118    2.2  1.80  1.50 10.0
## 18         1 2012 SOUTH     1      MESO   S1MESO  3119   1.05  0.90  0.55  8.0
## 19         1 2012 SOUTH     1      MESO   S1MESO  3120      2  1.25  1.20 10.0
## 20         1 2012 SOUTH     1      MESO   S1MESO  3131   1.28  1.14  1.00 10.0
## 21         1 2012 SOUTH     2      OPEN    S2OPEN   341   dead    NA    NA   NA
## 22         1 2012 SOUTH     2     TOTAL S2TOTAL  3178    1.4  2.50  2.15 18.0
## 23         1 2012 SOUTH     2     TOTAL S2TOTAL   101    1.9  3.31  2.65 15.0
## 24         1 2012 SOUTH     2     TOTAL S2TOTAL   102   1.75  2.70  2.55 16.0
## 25         1 2012 SOUTH     2     TOTAL S2TOTAL   103    1.8  2.75  2.30 16.0
## 26         1 2012 SOUTH     2     TOTAL S2TOTAL   104    2.7  4.05  4.00 35.2
## 27         1 2012 SOUTH     2     TOTAL S2TOTAL   105   2.02  2.85  1.49 17.0
## 28         1 2012 SOUTH     2     TOTAL S2TOTAL   108    1.9  3.10  2.85 19.0
## 29         1 2012 SOUTH     2     TOTAL S2TOTAL   109   1.85  2.45  1.90 19.0
## 30         1 2012 SOUTH     2     TOTAL S2TOTAL   110   1.65  1.90  1.54 17.0
```

```
## 31      1 2012 SOUTH      2      TOTAL S2TOTAL  111    1.4  2.35  1.45 14.0
## 32      1 2012 SOUTH      2      TOTAL S2TOTAL  113    2.5  3.25  2.30 22.0
## 33      1 2012 SOUTH      2      TOTAL S2TOTAL  115    2.05 5.40  4.50 33.0
## 34      1 2012 SOUTH      2      TOTAL S2TOTAL  116    2.26 3.50  3.10 33.0
## 35      1 2012 SOUTH      2      TOTAL S2TOTAL  117    2.13 2.40  2.30 20.0
## 36      1 2012 SOUTH      2      TOTAL S2TOTAL  118    1.8  3.15  2.55 22.0
## 37      1 2012 SOUTH      2      TOTAL S2TOTAL 1211    1.85 2.00  2.27 20.0
## 38      1 2012 SOUTH      2      TOTAL S2TOTAL 1212    1.5  2.15  1.80 15.0
## 39      1 2012 SOUTH      2      TOTAL S2TOTAL 1213    1.87 2.34  2.05 13.0
## 40      1 2012 SOUTH      2      TOTAL S2TOTAL 1214    1.58 1.28  0.75 11.0
## 41      1 2012 SOUTH      2      TOTAL S2TOTAL 1215    2.05 2.10  1.75 17.0
## 42      1 2012 SOUTH      2      TOTAL S2TOTAL 1216    1.75 2.45  3.28 16.0
## 43      1 2012 SOUTH      2      TOTAL S2TOTAL 1217    1.49 1.50  1.45 13.0
## 44      1 2012 SOUTH      2      TOTAL S2TOTAL 1218    1.28 2.00  0.90 10.0
## 45      1 2012 SOUTH      2      TOTAL S2TOTAL 1219    1.49 2.35  1.65 13.0
## 46      1 2012 SOUTH      2      TOTAL S2TOTAL 1220    1.07 1.20  0.95 11.0
## 47      1 2012 SOUTH      2      TOTAL S2TOTAL 1231    1.48 1.25  1.20  9.0
## 48      1 2012 SOUTH      2      TOTAL S2TOTAL 1232    1.25 1.25  0.90 10.0
## 49      1 2012 SOUTH      2      TOTAL S2TOTAL 1233    1.41 1.41  1.40 14.0
## 50      1 2012 SOUTH      2      TOTAL S2TOTAL 1234    1.6  1.60  1.30 13.0
## 51      1 2012 SOUTH      2      TOTAL S2TOTAL 1235    1.2  1.20  1.30 14.0
## 52      1 2012 SOUTH      2      TOTAL S2TOTAL 1236    1.49 1.49  1.20  8.0
## 53      1 2012 SOUTH      2      TOTAL S2TOTAL 1237    1.5  1.50  1.50 14.0
## 54      1 2012 SOUTH      2      TOTAL S2TOTAL 1238    1.65 1.65  2.00 20.0
## 55      1 2012 SOUTH      2      TOTAL S2TOTAL 1239    1.13 1.13  1.20 10.0
## 56      1 2012 SOUTH      2      TOTAL S2TOTAL 1240    1.25 1.25  0.90 10.0
## 57      1 2012 SOUTH      2      TOTAL S2TOTAL 1251    1.1  1.20  1.10 10.0
## 58      1 2012 SOUTH      2      TOTAL S2TOTAL 1252    2.2  2.70  2.40 25.0
## 59      1 2012 SOUTH      2      TOTAL S2TOTAL 1253    1.45 1.65  1.25 10.0
## 60      1 2012 SOUTH      2      TOTAL S2TOTAL 1254    1.6  2.45  2.10 13.0
## 61      1 2012 SOUTH      2      TOTAL S2TOTAL 1255    1.55 2.40  1.80 13.0
## 62      1 2012 SOUTH      2      TOTAL S2TOTAL 1256    1.5  2.40  2.15 13.0
## 63      1 2012 SOUTH      2      TOTAL S2TOTAL 1257    1.03 1.20  1.00 10.0
## 64      1 2012 SOUTH      2      TOTAL S2TOTAL 1258    2.14 1.90  1.70 13.0
## 65      1 2012 SOUTH      2      TOTAL S2TOTAL 1259    1.2  1.90  1.65 12.0
## 66      1 2012 SOUTH      2      TOTAL S2TOTAL 1260    1.05 1.10  1.00  9.0
## 67      1 2012 SOUTH      2      TOTAL S2TOTAL 2131    1.8  2.60  2.40 15.0
## 68      1 2012 SOUTH      2      TOTAL S2TOTAL 2132    1.2  1.00  0.95  7.0
## 69      1 2012 SOUTH      2      TOTAL S2TOTAL 2133    1.75 1.40  1.10 10.0
## 70      1 2012 SOUTH      2      TOTAL S2TOTAL 2134    1.45 3.10  1.80 10.0
## 71      1 2012 SOUTH      2      TOTAL S2TOTAL 2135    1.17 1.20  1.10  5.0
## 72      1 2012 SOUTH      2      TOTAL S2TOTAL 2136    2.15 3.10  2.58 22.0
## 73      1 2012 SOUTH      2      TOTAL S2TOTAL 2137    1.7  1.70  1.40 12.0
## 74      1 2012 SOUTH      2      TOTAL S2TOTAL 3132    1.98 2.85  2.70 12.0
## 75      1 2012 SOUTH      2      TOTAL S2TOTAL 3133    1.26 1.95  1.75 17.0
## 76      1 2012 SOUTH      2      TOTAL S2TOTAL 3134    1.11 1.95  1.50 10.0
## 77      1 2012 SOUTH      2      TOTAL S2TOTAL 3135    1.14 1.32  1.05 10.0
## 78      1 2012 SOUTH      2      TOTAL S2TOTAL 3136    1.26 1.60  1.40 10.0
## 79      1 2012 SOUTH      2      TOTAL S2TOTAL 3137    1.3  1.40  0.80 10.0
## 80      1 2012 SOUTH      2      TOTAL S2TOTAL 3138    1.29 1.44  1.35 13.0
## 81      1 2012 SOUTH      2      TOTAL S2TOTAL 3139    1.31 1.35  1.15  7.0
## 82      1 2012 SOUTH      2      TOTAL S2TOTAL 3140    1.15 1.70  1.28 10.0
## 83      1 2012 SOUTH      2      TOTAL S2TOTAL 3151    1.87 3.40  1.85 15.0
## 84      1 2012 SOUTH      2      TOTAL S2TOTAL 3152    1.47 2.10  1.61  8.0
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## 85     1 2012 SOUTH      2     TOTAL S2TOTAL 3153   1.05  1.79  1.50 10.0
## 86     1 2012 SOUTH      2     TOTAL S2TOTAL 3154    2.1  4.90  3.75 25.0
## 87     1 2012 SOUTH      2     TOTAL S2TOTAL 3155   1.99  1.80  1.35 13.0
## 88     1 2012 SOUTH      2     TOTAL S2TOTAL 3156   1.42  1.90  1.80 14.0
## 89     1 2012 SOUTH      2     TOTAL S2TOTAL 3157    1.5  2.11  1.75 12.0
## 90     1 2012 SOUTH      2     TOTAL S2TOTAL 3158   1.06  1.05  0.85  4.0
## 91     1 2012 SOUTH      2     TOTAL S2TOTAL 3159   1.49  1.50  1.15 13.0
## 92     1 2012 SOUTH      2     TOTAL S2TOTAL 3160    1.8  1.60  1.50 14.0
## 93     1 2012 SOUTH      2     TOTAL S2TOTAL 3171   1.93  1.74  1.20 14.0
## 94     1 2012 SOUTH      2     TOTAL S2TOTAL 3172    1.2  1.60  1.30 10.0
## 95     1 2012 SOUTH      2     TOTAL S2TOTAL 3173   1.65  1.25  1.10 11.0
## 96     1 2012 SOUTH      2     TOTAL S2TOTAL 3174   1.52  1.49  1.10 12.0
## 97     1 2012 SOUTH      2     TOTAL S2TOTAL 3175   1.43  2.05  1.54 13.0
## 98     1 2012 SOUTH      2     TOTAL S2TOTAL 3176   1.25  1.40  1.25 13.0
## 99     1 2012 SOUTH      2     TOTAL S2TOTAL 3177   1.88  2.65  2.64 20.0
## 100    1 2012 SOUTH      2     TOTAL S2TOTAL 3179   1.03  1.40  0.60 13.0
## 101    1 2012 SOUTH      2     TOTAL S2TOTAL 3180    1.1  1.30  1.20 10.0
## 102    1 2012 SOUTH      2     TOTAL S2TOTAL 3191    1.4  1.05  1.00 10.0
## 103    1 2012 SOUTH      2     TOTAL S2TOTAL 3192   1.05  1.55  0.90 10.0
## 104    1 2012 SOUTH      2     TOTAL S2TOTAL 3193   1.18  1.20  1.00  7.0
## 105    1 2012 SOUTH      2     TOTAL S2TOTAL 3194    1.4  1.30  1.85 13.0
## 106    1 2012 SOUTH      2     TOTAL S2TOTAL 3195   1.37  2.67  2.19 19.0
## 107    1 2012 SOUTH      2     TOTAL S2TOTAL 3196   1.32  2.15  1.55 11.0
## 108    1 2012 SOUTH      2     MEGA  S2MEGA   182   1.55  2.20  1.20 20.0
## 109    1 2012 SOUTH      2     MEGA  S2MEGA   183    1.3  1.80  0.90  8.0
## 110    1 2012 SOUTH      2     MEGA  S2MEGA   184   1.24  1.20  1.20 25.0
## 111    1 2012 SOUTH      2     MEGA  S2MEGA   185    1.5  2.10  1.75 16.0
## 112    1 2012 SOUTH      2     MEGA  S2MEGA   186   1.65  2.50  2.20 15.0
## 113    1 2012 SOUTH      2     MEGA  S2MEGA   187   2.17  2.00  1.20 15.0
## 114    1 2012 SOUTH      2     MEGA  S2MEGA   188   1.28  1.60  1.50 10.0
## 115    1 2012 SOUTH      2     MEGA  S2MEGA   189   1.07  1.50  1.50 10.0
## 116    1 2012 SOUTH      2     MEGA  S2MEGA   190   0.67  1.00  0.80  8.0
## 117    1 2012 SOUTH      2     MEGA  S2MEGA   191   0.68  0.70  0.60  4.0
## 118    1 2012 SOUTH      2     MEGA  S2MEGA   192   1.87  1.60  1.40  9.0
## 119    1 2012 SOUTH      2     MEGA  S2MEGA   193   1.35  1.90  1.50 14.0
## 120    1 2012 SOUTH      2     MEGA  S2MEGA   194   1.75  2.10  2.10 15.0
## 121    1 2012 SOUTH      2     MESO  S2MESO   462   1.75  3.30  2.50 23.0
## 122    1 2012 SOUTH      2     MESO  S2MESO   463   1.64  2.30  2.00 14.0
## 123    1 2012 SOUTH      2     MESO  S2MESO  2138   1.42  0.90  0.80 10.0
## 124    1 2012 SOUTH      3     OPEN  S3OPEN  1301   dead    NA    NA   NA
## 125    1 2012 SOUTH      3     OPEN  S3OPEN  1302    0.9  1.30  1.10 11.0
## 126    1 2012 SOUTH      3     TOTAL S3TOTAL 1061   dead    NA    NA   NA
## 127    1 2012 SOUTH      3     TOTAL S3TOTAL 1062    1.8  2.60  2.60 15.0
## 128    1 2012 SOUTH      3     TOTAL S3TOTAL 1063   2.47  3.10  2.20 18.0
## 129    1 2012 SOUTH      3     TOTAL S3TOTAL 1064   2.15  1.60  1.10 17.0
## 130    1 2012 SOUTH      3     TOTAL S3TOTAL 1066    1.7  2.50  2.15 15.0
## 131    1 2012 SOUTH      3     TOTAL S3TOTAL 1066    1.9  1.80  1.50 20.0
## 132    1 2012 SOUTH      3     TOTAL S3TOTAL 1067   1.95  2.10  1.90 13.0
## 133    1 2012 SOUTH      3     TOTAL S3TOTAL 1068    1.8  1.70  1.40 13.0
## 134    1 2012 SOUTH      3     TOTAL S3TOTAL 1069    1.4  2.00  1.60 14.0
## 135    1 2012 SOUTH      3     TOTAL S3TOTAL 1070      1  1.30  1.20  7.0
## 136    1 2012 SOUTH      3     TOTAL S3TOTAL 2139   1.75  1.20  1.10 13.0
## 137    1 2012 SOUTH      3     TOTAL S3TOTAL 2140   1.28  1.50  0.95  4.0
## 138    1 2012 SOUTH      3     TOTAL S3TOTAL 2151      1  1.40  1.20  4.0
```

```
## 139      1 2012 SOUTH      3   TOTAL S3TOTAL 2152  1.45  1.50  1.30 10.0
## 140      1 2012 SOUTH      3   TOTAL S3TOTAL 2153     1  1.00  0.75  8.0
## 141      1 2012 SOUTH      3   TOTAL S3TOTAL 2154  1.03  1.00  0.90  6.0
## 142      1 2012 SOUTH      3   TOTAL S3TOTAL 2155  1.51  2.00  1.80 12.0
## 143      1 2012 SOUTH      3   TOTAL S3TOTAL 2156  1.17  1.10  0.90 10.0
## 144      1 2012 SOUTH      3   TOTAL S3TOTAL 2157  1.33  1.90  1.85 14.0
## 145      1 2012 SOUTH      3   TOTAL S3TOTAL 2158   1.3  1.10  0.85  8.0
## 146      1 2012 SOUTH      3   TOTAL S3TOTAL 2159  1.13  1.10  0.90 10.0
## 147      1 2012 SOUTH      3   TOTAL S3TOTAL 2160  1.58  1.40  1.40 13.0
## 148      1 2012 SOUTH      3   TOTAL S3TOTAL 2171  1.06  1.40  1.00  5.0
## 149      1 2012 SOUTH      3   TOTAL S3TOTAL 2172  1.05  1.40  0.95  7.0
## 150      1 2012 SOUTH      3   TOTAL S3TOTAL 2173  1.45  1.60  1.10  6.0
## 151      1 2012 SOUTH      3   TOTAL S3TOTAL 2174  1.15  1.10  0.90  5.0
## 152      1 2012 SOUTH      3   TOTAL S3TOTAL 2175  1.42  1.45  1.30 13.0
## 153      1 2012 SOUTH      3   TOTAL S3TOTAL 2176  1.02  1.20  1.00  8.0
## 154      1 2012 SOUTH      3   TOTAL S3TOTAL 2177   1.4  1.20  1.00  9.0
## 155      1 2012 SOUTH      3   TOTAL S3TOTAL 2178  1.45  2.10  2.05 15.0
## 156      1 2012 SOUTH      3   MESO   S3MESO 1421  1.95  2.20  1.60 13.0
## 157      1 2012 SOUTH      3   MESO   S3MESO 1422  dead    NA    NA   NA
##     FLOWERS BUDS FRUITS  ANT
## 1         0    0     10   CS
## 2         0    0    150   TP
## 3         2    1     50   TP
## 4         0    0     75   CS
## 5         0    0     20   CS
## 6         0    0      0    E
## 7         0    0      0   CS
## 8         0    0     25   CS
## 9         0    0      0   TP
## 10        0    0     50   TP
## 11        0    0      5   CS
## 12        0    0     60   TP
## 13        0    0     60   TP
## 14        2    0     60   CS
## 15        2    0      0   CS
## 16        0    0      0   TP
## 17        0    0      0   TP
## 18        0    0      0   CS
## 19        0    0      0   CM
## 20        0    0      0   TP
## 21       NA   NA     NA
## 22        0    0      5   CS
## 23        0    0     45   CS
## 24       40   50     35   CS
## 25        8    2     65   CS
## 26        0    0     20   TP
## 27        0    0     70   CS
## 28        0    0    125   CM
## 29        0    0    200   CM
## 30        0    0     10   CS
## 31        0    0      0   CS
## 32        0    0     35   TP
## 33        0    0    300   CM
## 34        2    2    100   CS
```

```
## 35         0    0    30    CM
## 36         0    0    50    TP
## 37         0    0    10    CM
## 38         0    0    25    CS
## 39         0    0    15    TP
## 40         0    0     0    TP
## 41         0    0    15    TP
## 42         0    0     0    TP
## 43         0    0    40    TP
## 44         0    0     0    TP
## 45         0    0    15    CM
## 46         0    0     0    CM
## 47         0    0     0    TP
## 48         0    0     0    TP
## 49         0    0     1    TP
## 50         0    0    20    TP
## 51         0    0     0    TP
## 52         0    0     0    TP
## 53         0    0    20    TP
## 54         0    0     0    TP
## 55         0    0     0    CN
## 56         0    0     0    CN
## 57         0    0     0    TP
## 58         0    0     5    TP
## 59         0    0     0    TP
## 60         0    0    25    TP
## 61         0    0    25    TP
## 62         0    0    20    TP
## 63         0    0     0    TP
## 64         0    0    10    CS
## 65         1    0    25    CS
## 66         0    0     0    TP
## 67         0    0    10    TP
## 68         0    0     0    TP
## 69         0    0     0    TP
## 70         0    0     0    TP
## 71         0    0     0    TP
## 72         0    0     0    CS
## 73         0    0     0    CS
## 74         0    0    25 AB_TP
## 75         0    0     0    TP
## 76         0    0     0    TP
## 77         0    0     0    TP
## 78         0    0     0    CS
## 79         0    0     0    CS
## 80         0    0     0    CS
## 81         0    0     0    CS
## 82         0    0     5    CS
## 83         6    0     0    CS
## 84         0    0     0    CS
## 85         0    0     1    CS
## 86         0    0    25    CS
## 87         0    0     0    CS
## 88         0    0     0    CS
```

```
## 89      0   0   10   CS
## 90      0   0    0   CS
## 91      0   0   35   CS
## 92      0   0    0   CS
## 93      0   0    0   CS
## 94      0   0    0   CS
## 95      0   0    0   CS
## 96      0   0   20   CS
## 97      0   0    0   CS
## 98      0   0    0   CM
## 99      0   0  100   CM
## 100     0   0    0   CS
## 101     0   0    0   CS
## 102     0   0    0   CS
## 103     0   0    0   CM
## 104     0   0    0   TP
## 105     0   0   30   CS
## 106     0   0   50   TP
## 107     0   0   10   CS
## 108     0   0    0   CS
## 109     0   0   15   CS
## 110     0   0   10   CS
## 111     5   0  200   CS
## 112     0   0   80   CS
## 113     0   0  150   TP
## 114     0   0   40   TP
## 115     0   0   60   TP
## 116     0   0    0   CS
## 117     0   0    0   TP
## 118     0   0   40   CS
## 119     0   0   20   CS
## 120     0   0   75   TP
## 121     0   0   20   CM
## 122     0   0    0   TP
## 123     0   0    0    E
## 124    NA  NA   NA
## 125     0   0    0   TP
## 126    NA  NA   NA
## 127     0   0   50   TP
## 128     0   0    0   TP
## 129     0   0    0   TP
## 130     0   0    2   TP
## 131     0   0   25   TP
## 132     0   0    0   TP
## 133     0   0    0   TP
## 134     0   0    0   TP
## 135     0   0    0   TP
## 136     0   0    0   TP
## 137     0   0    0   TP
## 138     0   0    0   TP
## 139     0   0    0   TP
## 140     0   0    0   TP
## 141     0   0    0   TP
## 142     0   0    0   TP
```

```
## 143        0    0        0    TP
## 144        0    0        0    TP
## 145        0    0        0    TP
## 146        0    0        0    TP
## 147        0    0        0    TP
## 148        0    0        8    TP
## 149        0    0        0    TP
## 150        0    0        0    TP
## 151        0    0        0    TP
## 152        0    0        0    TP
## 153        0    0        0    TP
## 154        0    0        0    TP
## 155        0    0       20    TP
## 156        0    0        2    CS
## 157       NA   NA       NA
```

```
acacia <-read.csv(file = "/Users/atziri/Bio 195-197/Data Science/raw-data/ACACIA_DREPANOLOBIUM_SURVEY.t
```

3. explore our data set

'head()' gives us the first six rows

```
head(acacia)
```

```
##    SURVEY YEAR   SITE BLOCK TREATMENT    PLOT    ID HEIGHT AXIS1 AXIS2 CIRC
## 1       1 2012 SOUTH     1     TOTAL S1TOTAL  581   2.25  2.75  2.15   20
## 2       1 2012 SOUTH     1     TOTAL S1TOTAL  582   2.65  4.10  3.90   28
## 3       1 2012 SOUTH     1     TOTAL S1TOTAL 3111    1.5  1.70  0.85   17
## 4       1 2012 SOUTH     1     TOTAL S1TOTAL 3112   2.01  1.80  1.60   12
## 5       1 2012 SOUTH     1     TOTAL S1TOTAL 3113   1.75  1.84  1.42   13
## 6       1 2012 SOUTH     1     TOTAL S1TOTAL 3114   1.65  1.62  0.85   15
##   FLOWERS BUDS FRUITS ANT
## 1       0    0     10  CS
## 2       0    0    150  TP
## 3       2    1     50  TP
## 4       0    0     75  CS
## 5       0    0     20  CS
## 6       0    0      0   E
```

```
summary(acacia)
```

```
##       SURVEY        YEAR          SITE               BLOCK
##   Min.   :1   Min.   :2012   Length:157         Min.   :1.000
##   1st Qu.:1   1st Qu.:2012   Class :character   1st Qu.:2.000
##   Median :1   Median :2012   Mode  :character   Median :2.000
##   Mean   :1   Mean   :2012                      Mean   :2.089
##   3rd Qu.:1   3rd Qu.:2012                      3rd Qu.:2.000
##   Max.   :1   Max.   :2012                      Max.   :3.000
##
##   TREATMENT            PLOT                ID         HEIGHT
##   Length:157        Length:157        Min.   : 101   Length:157
```

```
## Class :character   Class :character   1st Qu.:1062   Class :character
## Mode  :character   Mode  :character   Median :1301   Mode  :character
##                                       Mean   :1743
##                                       3rd Qu.:3118
##                                       Max.   :3199
##
##      AXIS1            AXIS2             CIRC            FLOWERS
## Min.   :0.700   Min.   :0.550   Min.   : 4.00   Min.   : 0.0000
## 1st Qu.:1.400   1st Qu.:1.100   1st Qu.:10.00   1st Qu.: 0.0000
## Median :1.800   Median :1.490   Median :13.00   Median : 0.0000
## Mean   :1.972   Mean   :1.636   Mean   :13.76   Mean   : 0.4444
## 3rd Qu.:2.350   3rd Qu.:2.000   3rd Qu.:16.00   3rd Qu.: 0.0000
## Max.   :5.550   Max.   :4.820   Max.   :35.20   Max.   :40.0000
## NA's   :4       NA's   :4       NA's   :4       NA's   :4
##      BUDS            FRUITS            ANT
## Min.   : 0.0000   Min.   :  0.00   Length:157
## 1st Qu.: 0.0000   1st Qu.:  0.00   Class :character
## Median : 0.0000   Median :  0.00   Mode  :character
## Mean   : 0.3595   Mean   : 20.03
## 3rd Qu.: 0.0000   3rd Qu.: 25.00
## Max.   :50.0000   Max.   :300.00
## NA's   :4         NA's   :4
```

```
colnames(acacia)
```

```
## [1] "SURVEY"    "YEAR"      "SITE"      "BLOCK"     "TREATMENT" "PLOT"
## [7] "ID"        "HEIGHT"    "AXIS1"     "AXIS2"     "CIRC"      "FLOWERS"
## [13] "BUDS"     "FRUITS"    "ANT"
```

make sure that everything htat should be a numeric value is a number one way to check is the 'summary()' command

another way is using the type function

```
typeof(acacia [,"HEIGHT"])
```

```
## [1] "character"
```

```
acacia$HEIGHT
```

```
##   [1] "2.25" "2.65" "1.5"  "2.01" "1.75" "1.65" "1.2"  "1.45" "1.87" "2.38"
##  [11] "2.58" "2.65" "2.35" "1.88" "2.32" "2.39" "2.2"  "1.05" "2"     "1.28"
##  [21] "dead" "1.4"  "1.9"  "1.75" "1.8"  "2.7"  "2.02" "1.9"  "1.85" "1.65"
##  [31] "1.4"  "2.5"  "2.05" "2.26" "2.13" "1.8"  "1.85" "1.5"  "1.87" "1.58"
##  [41] "2.05" "1.75" "1.49" "1.28" "1.49" "1.07" "1.48" "1.25" "1.41" "1.6"
##  [51] "1.2"  "1.49" "1.5"  "1.65" "1.13" "1.25" "1.1"  "2.2"  "1.45" "1.6"
##  [61] "1.55" "1.5"  "1.03" "2.14" "1.2"  "1.05" "1.8"  "1.2"  "1.75" "1.45"
##  [71] "1.17" "2.15" "1.7"  "1.98" "1.26" "1.11" "1.14" "1.26" "1.3"  "1.29"
##  [81] "1.31" "1.15" "1.87" "1.47" "1.05" "2.1"  "1.99" "1.42" "1.5"  "1.06"
##  [91] "1.49" "1.8"  "1.93" "1.2"  "1.65" "1.52" "1.43" "1.25" "1.88" "1.03"
## [101] "1.1"  "1.4"  "1.05" "1.18" "1.4"  "1.37" "1.32" "1.55" "1.3"  "1.24"
## [111] "1.5"  "1.65" "2.17" "1.28" "1.07" "0.67" "0.68" "1.87" "1.35" "1.75"
```

```
## [121] "1.75" "1.64" "1.42" "dead" "0.9"  "dead" "1.8"  "2.47" "2.15" "1.7"
## [131] "1.9"  "1.95" "1.8"  "1.4"  "1"     "1.75" "1.28" "1"     "1.45" "1"
## [141] "1.03" "1.51" "1.17" "1.33" "1.3"   "1.13" "1.58" "1.06" "1.05" "1.45"
## [151] "1.15" "1.42" "1.02" "1.4"  "1.45" "1.95" "dead"
```

we identifyed a column that has problematic data we need to fix this

We are going to read the data table again, but we are going to assign 'NA' to the "dead value"that we dont want in our arguments are always plain text

```
acacia <- read.csv(file = "/Users/atziri/Bio 195-197/Data Science/raw-data/ACACIA_DREPANOLOBIUM_SURVEY.
```

4. Visualize our data

For this we are using the 'ggplot' package. lets install and load it

```
# install.packages("ggplot2")
library(ggplot2)
```

Now We are going to create our first plotting layer with the function 'ggplot.

```
colnames(acacia)
```

```
##  [1] "SURVEY"    "YEAR"     "SITE"     "BLOCK"    "TREATMENT" "PLOT"
##  [7] "ID"        "HEIGHT"   "AXIS1"    "AXIS2"    "CIRC"      "FLOWERS"
## [13] "BUDS"      "FRUITS"   "ANT"
```

```
acacia$CIRC
```

```
##   [1] 20.0 28.0 17.0 12.0 13.0 15.0  9.0 12.2 13.0 35.0 24.0 27.0 20.0 28.0 30.0
##  [16] 13.0 10.0  8.0 10.0 10.0   NA 18.0 15.0 16.0 16.0 35.2 17.0 19.0 19.0 17.0
##  [31] 14.0 22.0 33.0 33.0 20.0 22.0 20.0 15.0 13.0 11.0 17.0 16.0 13.0 10.0 13.0
##  [46] 11.0  9.0 10.0 14.0 13.0 14.0  8.0 14.0 20.0 10.0 10.0 10.0 25.0 10.0 13.0
##  [61] 13.0 13.0 10.0 13.0 12.0  9.0 15.0  7.0 10.0 10.0  5.0 22.0 12.0 12.0 17.0
##  [76] 10.0 10.0 10.0 10.0 13.0  7.0 10.0 15.0  8.0 10.0 25.0 13.0 14.0 12.0  4.0
##  [91] 13.0 14.0 14.0 10.0 11.0 12.0 13.0 13.0 20.0 13.0 10.0 10.0 10.0  7.0 13.0
## [106] 19.0 11.0 20.0  8.0 25.0 16.0 15.0 15.0 10.0 10.0  8.0  4.0  9.0 14.0 15.0
## [121] 23.0 14.0 10.0   NA 11.0   NA 15.0 18.0 17.0 15.0 20.0 13.0 13.0 14.0  7.0
## [136] 13.0  4.0  4.0 10.0  8.0  6.0 12.0 10.0 14.0  8.0 10.0 13.0  5.0  7.0  6.0
## [151]  5.0 13.0  8.0  9.0 15.0 13.0   NA
```

```
ggplot(data = acacia, mapping = aes(x = CIRC, y = HEIGHT )) + geom_point()
```

```
## Warning: Removed 4 rows containing missing values (geom_point).
```