project

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```r
library(ggplot2)
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.1.3
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
library(tidyr)
```

```
## Warning: package 'tidyr' was built under R version 4.1.3
```

```r
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.1.3
```

```r
data<- read_xlsx('C:/Users/mannuh/Desktop/memory.xlsx', sheet = 'in')
head(data)
```

```
## # A tibble: 6 x 28
##    Gender   Age TotalTime  T1RH  T1RM  T1WH  T1WM T1ADI  T2RH  T2RM  T2WH  T2WM
##    <chr>  <dbl>     <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 Male      18      322.     6     7     6     8 0.5      12     5     8     2
## 2 Female    18      282.     5    10     3     9 0.63     10     5     8     4
## 3 Female    18      346.     5    10     3     9 0.63      9     9     4     5
## 4 Female    18      375.     9    10     3     5 0.794    17    10     3    -3
## 5 Female    18      373.     1    12     1    13 0.5       5    11     2     9
## 6 Female    19      302.     5    10     3     9 0.63      7    10     3     7
## # i 16 more variables: T2ADI <dbl>, T3RH <dbl>, T3RM <dbl>, T3WH <dbl>,
## #   T3WM <dbl>, T3ADI <dbl>, T4RH <dbl>, T4RM <dbl>, T4WH <dbl>, T4WM <dbl>,
## #   T4ADI <dbl>, T5RH <dbl>, T5RM <dbl>, T5WH <dbl>, T5WM <dbl>, T5ADI <dbl>
```

```
CleanData<- mutate(data,
                   'AVGTRM'= (T1RM+T2RM+T3RM+T4RM+T5RM)/5,
                   'AVGTRH'= (T1RH+T2RH+T3RH+T4RH+T5RH)/5,
                   'AVGTWH'= (T1WH+T2WH+T3WH+T4WH+T5WH)/5,
                   'AVGTADI'= (T1ADI+T2ADI+T3ADI+T4ADI+T5ADI)/5,
                   'AVGTWM'= (T1WM+T2WM+T3WM+T4WM+T5WM)/5)
anova_A <- lm(AVGTRH ~ AVGTRM + AVGTWH + AVGTADI, data = CleanData)
 regres<- lm(AVGTRH~Gender+Age, data=CleanData)
 regression <- lm(AVGTADI~ Age+Gender, data=CleanData)
```

```
View(CleanData)
CleanDat <- select(CleanData, Gender, Age, AVGTRM, AVGTRH, AVGTWH, AVGTWM, AVGTADI)
View(CleanDat)
anova_AVGTRM <- lm(AVGTRM ~ Gender + Age, data = CleanData)
anova_AVGTRH <- lm(AVGTRH ~ Gender + Age, data = CleanData)
anova_AVGTWH <- lm(AVGTWH ~ Gender + Age, data = CleanData)
anova_AVGTADI <- lm(AVGTADI ~ Gender + Age, data = CleanData)
summary(anova_AVGTADI)
```

```
##
## Call:
## lm(formula = AVGTADI ~ Gender + Age, data = CleanData)
##
## Residuals:
##      Min      1Q   Median      3Q      Max
## -0.75143 -0.23908 -0.03363  0.18355  2.67023
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.55954    0.73141   0.765    0.449
## GenderMale  -0.15612    0.16981  -0.919    0.364
## Age          0.03152    0.03739   0.843    0.405
##
## Residual standard error: 0.5228 on 38 degrees of freedom
## Multiple R-squared:  0.03388,    Adjusted R-squared:  -0.01697
## F-statistic: 0.6662 on 2 and 38 DF,  p-value: 0.5195
```

```
summary(anova_AVGTRH)
```

```
##
## Call:
## lm(formula = AVGTRH ~ Gender + Age, data = CleanData)
##
## Residuals:
##      Min      1Q   Median      3Q      Max
## -15.6129  -7.2322  -0.3327   6.3871  17.3871
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  27.6548    12.3043   2.248   0.0305 *
## GenderMale   -0.4802     2.8567  -0.168   0.8674
## Age          -0.3801     0.6290  -0.604   0.5493
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.795 on 38 degrees of freedom
## Multiple R-squared:  0.01145,    Adjusted R-squared:  -0.04058
## F-statistic: 0.2201 on 2 and 38 DF,  p-value: 0.8035
```

summary(anova_AVGTRM)

```
##
## Call:
## lm(formula = AVGTRM ~ Gender + Age, data = CleanData)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -7.4801 -1.4897  0.1199  1.7199  4.8340
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  9.981280   3.605950   2.768  0.00867 **
## GenderMale  -1.709314   0.837196  -2.042  0.04817 *
## Age         -0.004818   0.184345  -0.026  0.97929
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.578 on 38 degrees of freedom
## Multiple R-squared:  0.1019, Adjusted R-squared:  0.05459
## F-statistic: 2.155 on 2 and 38 DF,  p-value: 0.1299
```

summary(anova_AVGTWH)

```
##
## Call:
## lm(formula = AVGTWH ~ Gender + Age, data = CleanData)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.8340 -1.7199 -0.1199  1.4897  7.4801
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 3.018720   3.605950   0.837   0.4077
## GenderMale  1.709314   0.837196   2.042   0.0482 *
## Age         0.004818   0.184345   0.026   0.9793
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.578 on 38 degrees of freedom
## Multiple R-squared:  0.1019, Adjusted R-squared:  0.05459
## F-statistic: 2.155 on 2 and 38 DF,  p-value: 0.1299
```

```
summary(anova_A)
```

```
##
## Call:
## lm(formula = AVGTRH ~ AVGTRM + AVGTWH + AVGTADI, data = CleanData)
##
## Residuals:
##     Min     1Q  Median     3Q     Max
## -11.322  -4.199  -1.469   3.828  24.098
##
## Coefficients: (1 not defined because of singularities)
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   2.5206     5.2833   0.477 0.636026
## AVGTRM        0.8629     0.4477   1.927 0.061450 .
## AVGTWH           NA         NA      NA       NA
## AVGTADI       8.5133     2.2893   3.719 0.000644 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 7.432 on 38 degrees of freedom
## Multiple R-squared:  0.2942, Adjusted R-squared:  0.257
## F-statistic:  7.92 on 2 and 38 DF,  p-value: 0.001334
```

```
summary(regression)
```

```
##
## Call:
## lm(formula = AVGTADI ~ Age + Gender, data = CleanData)
##
## Residuals:
##       Min       1Q   Median       3Q      Max
## -0.75143 -0.23908 -0.03363  0.18355  2.67023
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.55954    0.73141   0.765    0.449
## Age          0.03152    0.03739   0.843    0.405
## GenderMale  -0.15612    0.16981  -0.919    0.364
##
## Residual standard error: 0.5228 on 38 degrees of freedom
## Multiple R-squared:  0.03388,    Adjusted R-squared:  -0.01697
## F-statistic: 0.6662 on 2 and 38 DF,  p-value: 0.5195
```

```
t<- t.test(CleanDat$AVGTRH,CleanDat$AVGTWM)
print(t)
```

```
##
##  Welch Two Sample t-test
##
## data:  CleanDat$AVGTRH and CleanDat$AVGTWM
## t = 13.648, df = 80, p-value < 2.2e-16
```

```
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##   22.20055 29.77994
## sample estimates:
## mean of x mean of y
## 19.995122 -5.995122
```
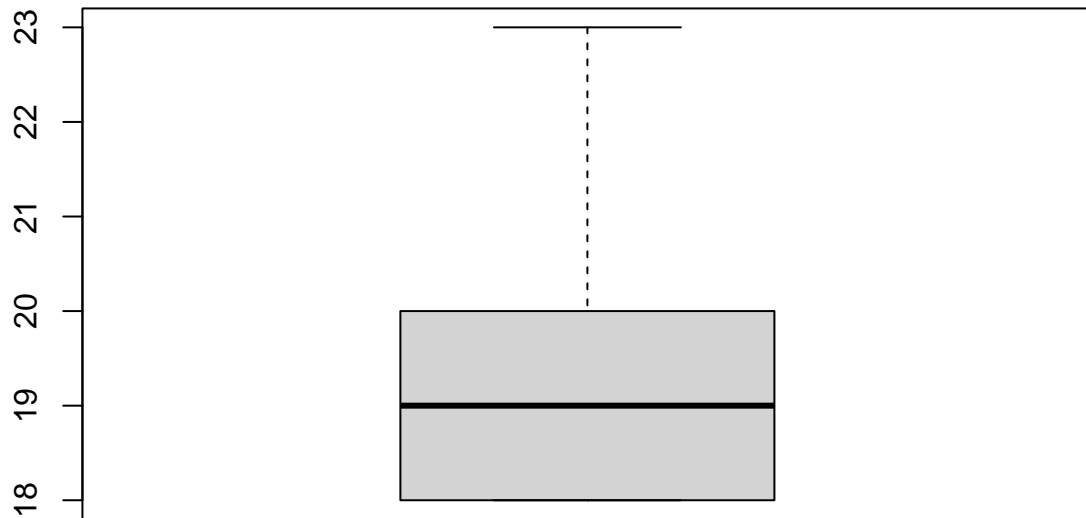
summary(regres)

```
##
## Call:
## lm(formula = AVGTRH ~ Gender + Age, data = CleanData)
##
## Residuals:
##       Min      1Q   Median      3Q      Max
## -15.6129  -7.2322  -0.3327   6.3871  17.3871
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  27.6548    12.3043   2.248   0.0305 *
## GenderMale   -0.4802     2.8567  -0.168   0.8674
## Age          -0.3801     0.6290  -0.604   0.5493
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.795 on 38 degrees of freedom
## Multiple R-squared:  0.01145,   Adjusted R-squared:  -0.04058
## F-statistic: 0.2201 on 2 and 38 DF,  p-value: 0.8035
```

summary(CleanDat$AVGTADI)

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.3754  0.8930  1.0932  1.1182  1.2698  3.8916
```
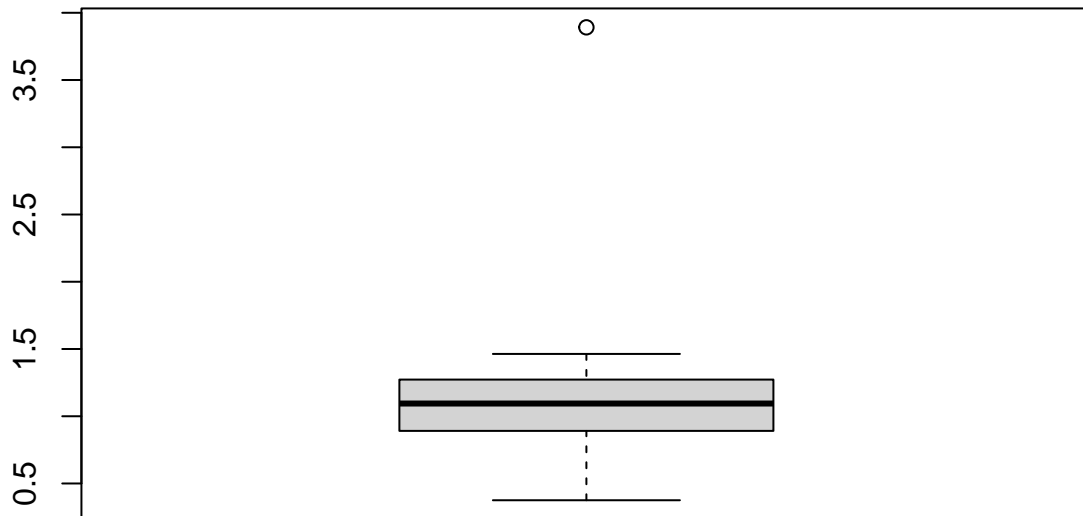
FData<- subset(CleanDat, Age <= 24)
boxplot(FData$Age, main = "Boxplot of AVGNTP")

Boxplot of AVGNTP


```
boxplot(FData$AVGTADI, main = "Boxplot of AVGNTP")
```
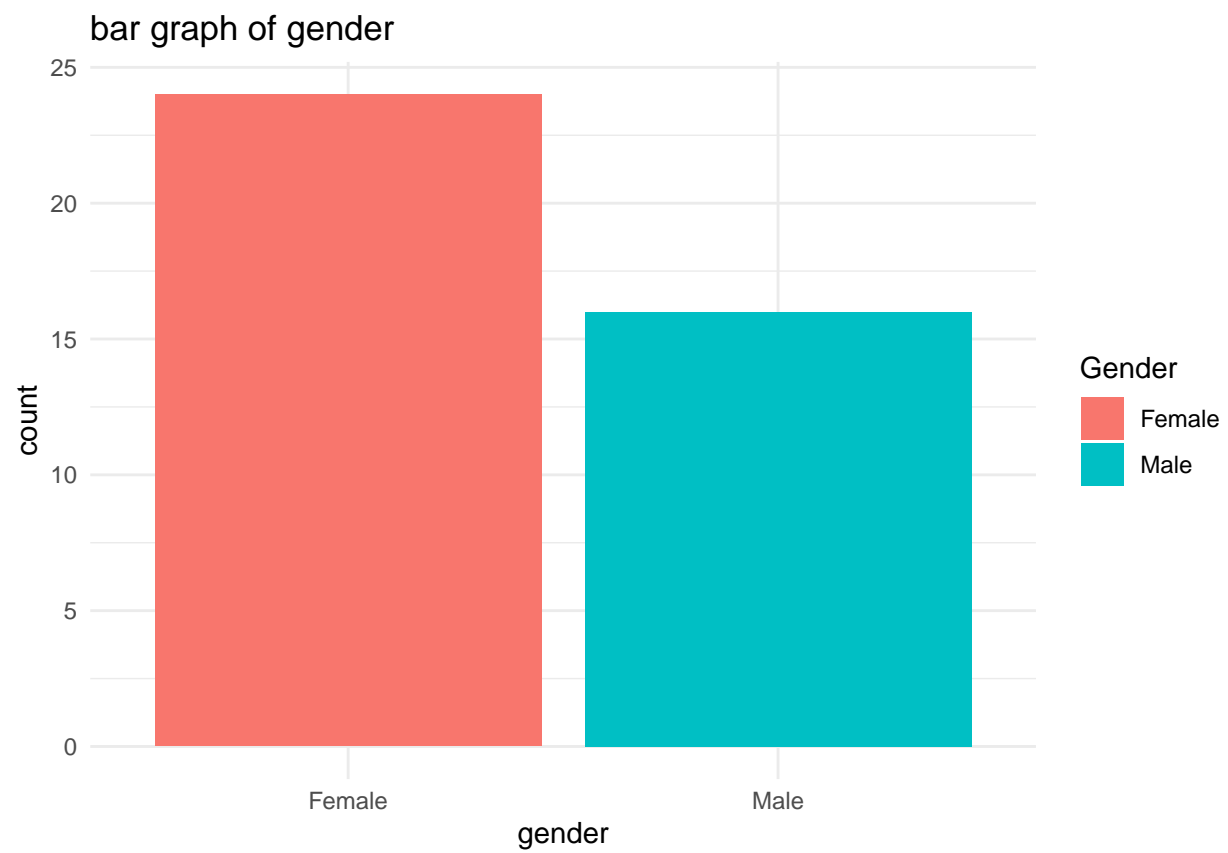
Boxplot of AVGNTP


```r
regres<- lm(AVGTRH~Gender+Age, data=FData)
summary(regres)
```

```
##
## Call:
## lm(formula = AVGTRH ~ Gender + Age, data = FData)
##
## Residuals:
##      Min      1Q   Median      3Q      Max
## -15.3583  -6.8398   0.0737   5.9803  17.6417
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 20.06724   19.15902   1.047    0.302
## GenderMale  -1.09130    3.11450  -0.350    0.728
## Age          0.02728    1.00827   0.027    0.979
##
## Residual standard error: 8.881 on 37 degrees of freedom
## Multiple R-squared:  0.003691,   Adjusted R-squared:  -0.05016
## F-statistic: 0.06853 on 2 and 37 DF,  p-value: 0.9339
```
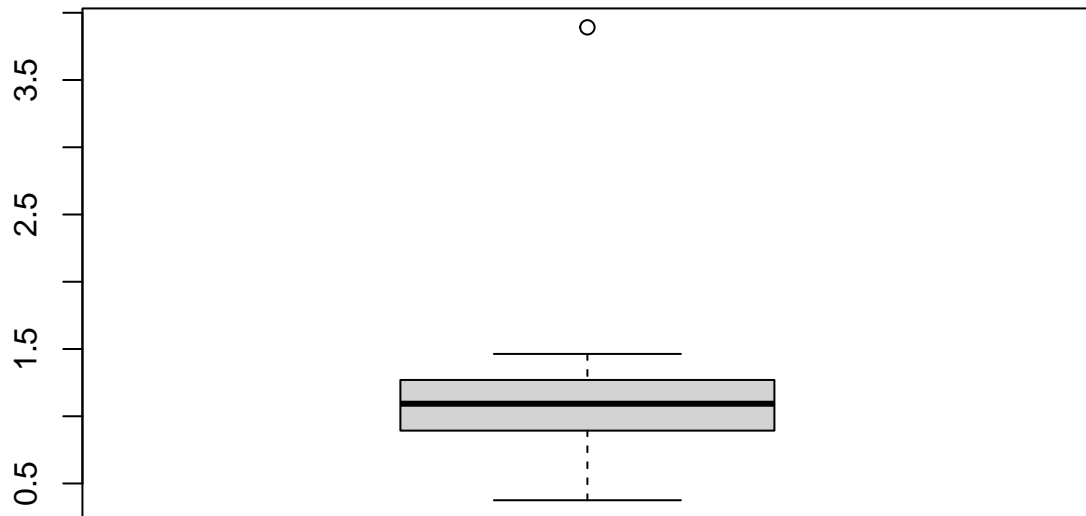
```r
ggplot(FData,mapping =aes(x=Gender,fill=Gender))+
  geom_bar() +
  labs(title = "bar graph of gender",
       x = "gender",
```

```
        y = "count")+
theme_minimal()
```
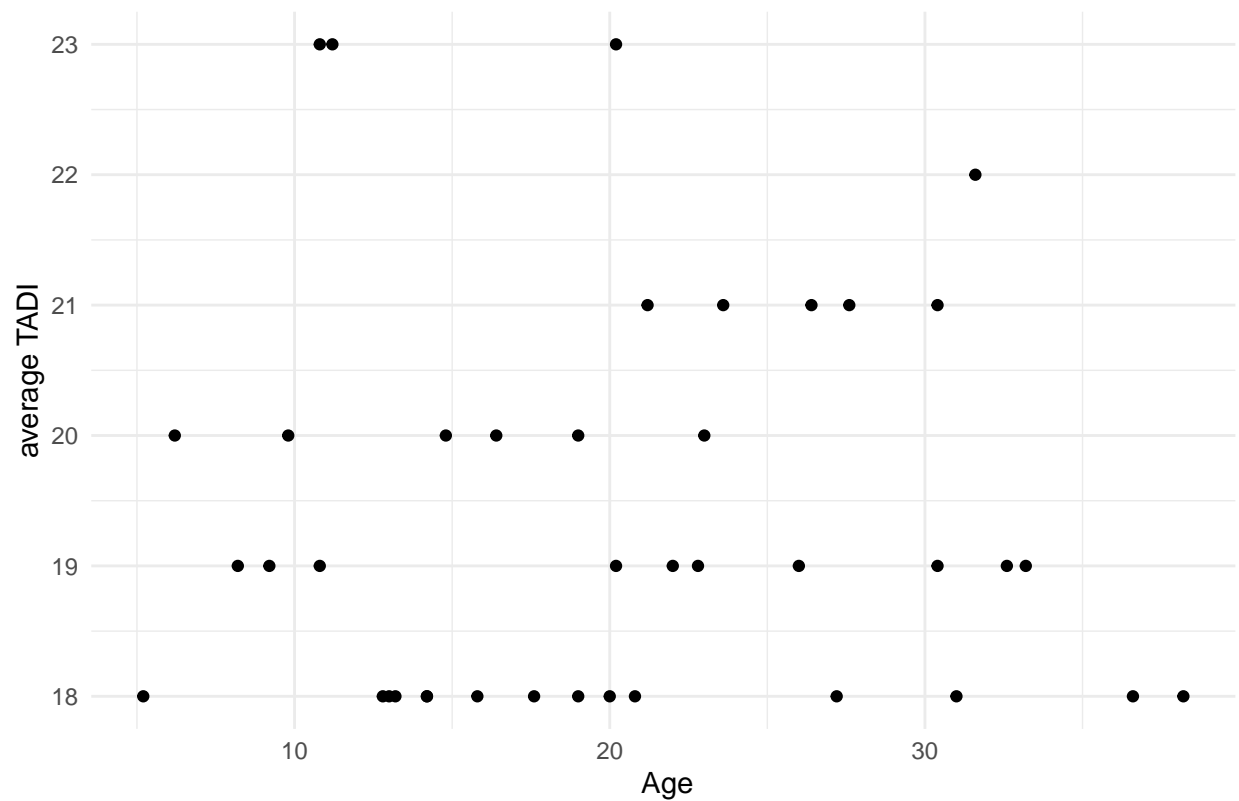
bar graph of gender


```
boxplot(CleanDat$AVGTADI, main = "Boxplot of AVGNTP")
```

Boxplot of AVGNTP


```
ggplot(FData,mapping =aes(x=AVGTRH, y=Age))+
 geom_point() +
 labs(title = "Scatter Plot of  Average TADI Vs Age   ",
      x = " Age",
      y = "average TADI")+
 theme_minimal()
```

Scatter Plot of Average TADI Vs Age


```
corre<-cor(FData[,c('AVGTRH','AVGTRM')])
print(corre)
```

```
##            AVGTRH    AVGTRM
## AVGTRH 1.0000000 0.1835295
## AVGTRM 0.1835295 1.0000000
```