

# Mini Project 1

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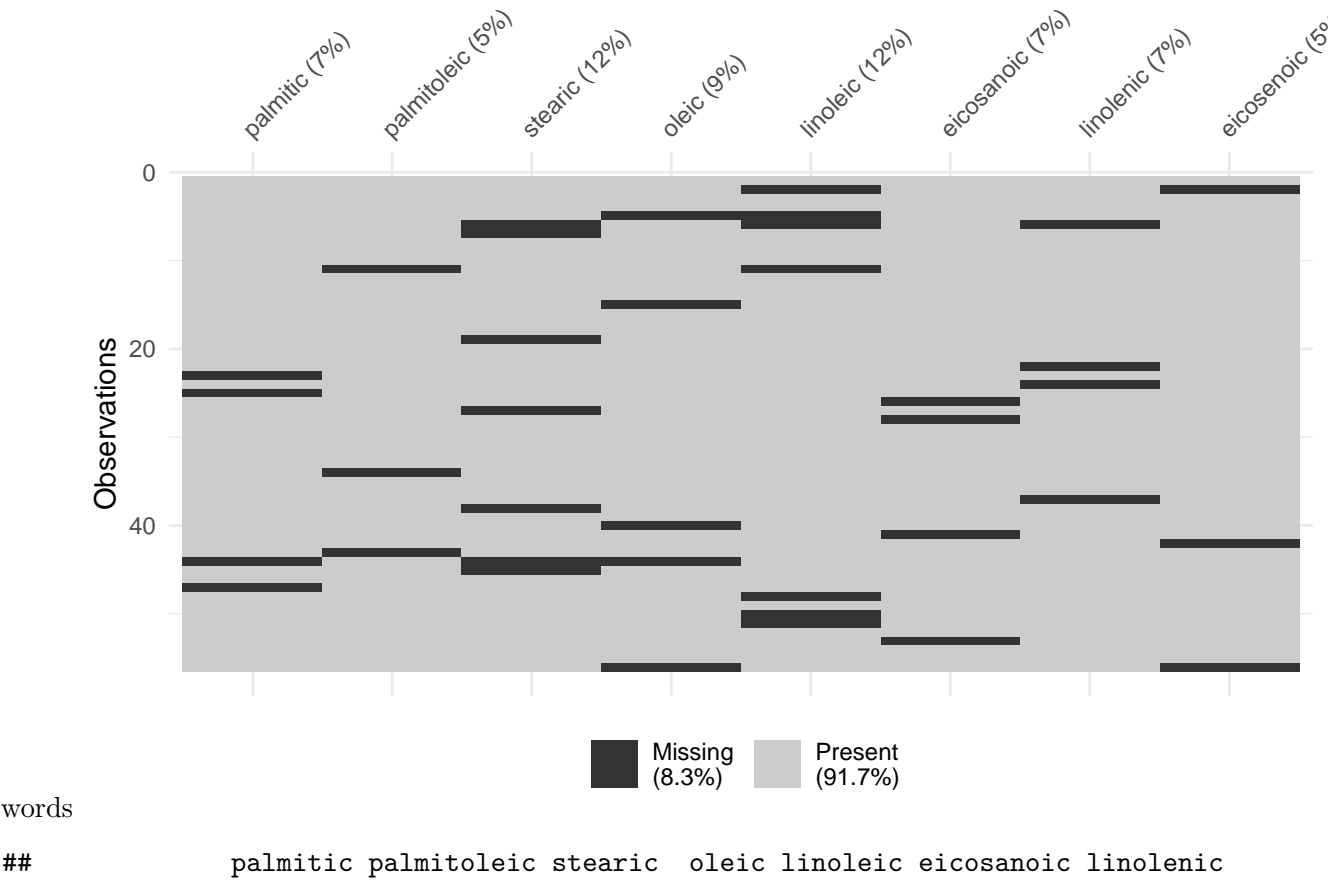
## Introduction

words

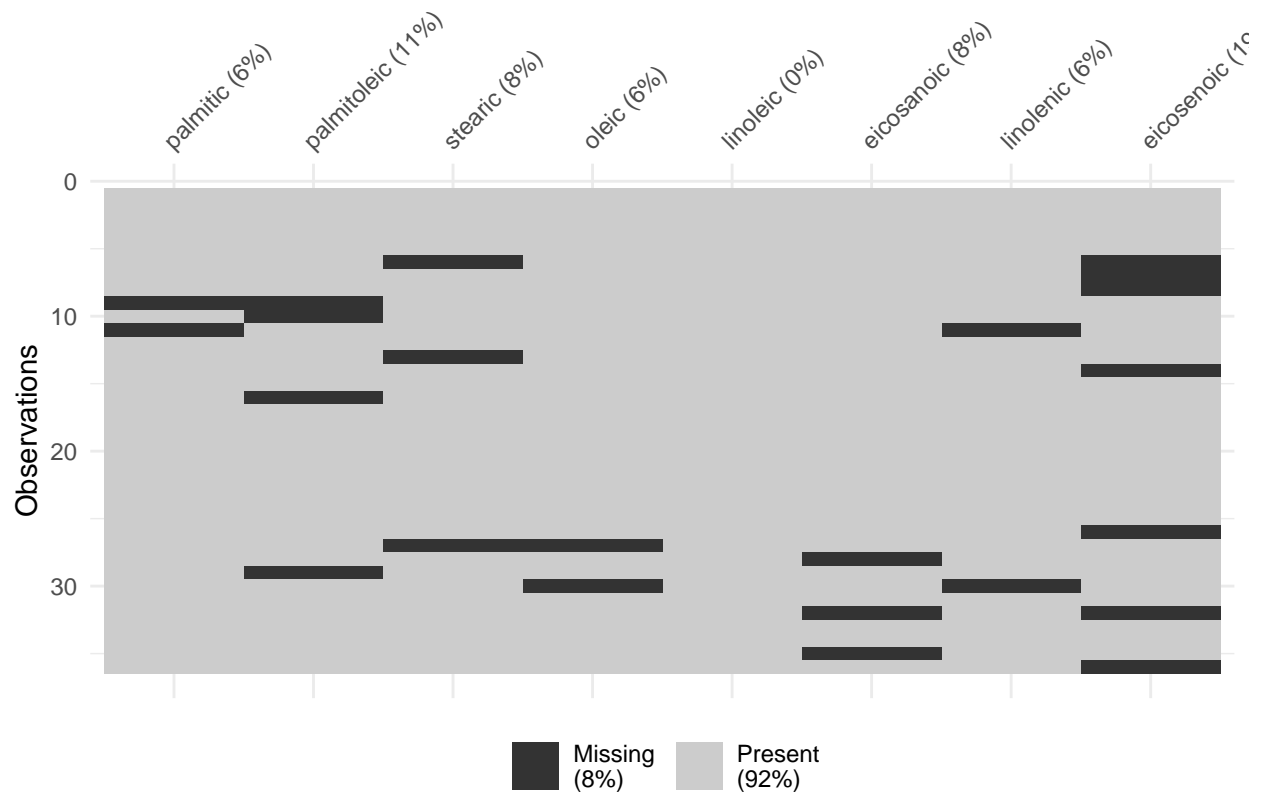
## Data Preparation

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## Assessment of Missing at Random (MAR) Assumption



```
## palmitic      NA      1.0000 0.4231 0.3196      1.0000      1      1.0000
## palmitoleic   1.0000      NA      1.0000 1.0000      0.3354      1      1.0000
## stearic       0.4231      1.0000      NA 0.5008      1.0000      1      0.4231
## oleic         0.3196      1.0000 0.5008      NA      0.5008      1      1.0000
## linoleic      1.0000      0.3354 1.0000 0.5008      NA      1      0.4231
## eicosanoic    1.0000      1.0000 1.0000 1.0000      1.0000      NA      1.0000
## linolenic     1.0000      1.0000 0.4231 1.0000      0.4231      1      NA
## eicosenoic    1.0000      1.0000 1.0000 0.2487      0.3354      1      1.0000
##
## eicosenoic
## palmitic      1.0000
## palmitoleic   1.0000
## stearic       1.0000
## oleic         0.2487
## linoleic      0.3354
## eicosanoic    1.0000
## linolenic     1.0000
## eicosenoic    NA
```



```
##      palmitic palmitoleic stearic  oleic eicosanoic linolenic eicosenoic
## palmitic      NA      0.2127  1.0000 1.0000      1.0000  0.1095  1.0000
## palmitoleic   0.2127      NA      1.0000 1.0000      1.0000  1.0000  0.5658
## stearic       1.0000      1.0000      NA 0.1619      1.0000  1.0000  0.4882
## oleic         1.0000      1.0000 0.1619      NA      1.0000  0.1095  1.0000
## eicosanoic    1.0000      1.0000 1.0000 1.0000      NA      1.0000  0.4882
```

## linolenic	0.1095	1.0000	1.0000	0.1095	1.0000	NA	1.0000
## eicosenoic	1.0000	0.5658	0.4882	1.0000	0.4882	1.0000	NA

## Analysis for Region 2

words

```
## $mean
##      palmitic palmitoleic      stearic      oleic      linoleic eicosanoic
## 1299.62401   121.09219   264.46005   7311.74026   817.85339    45.68766
##      linolenic eicosenoic
##      63.55326    28.26358
##
## $total_variance
##      palmitic palmitoleic      stearic      oleic      linoleic
## palmitic      77.1611779   3.636514038   0.62693838 -111.353001   28.165001
## palmitoleic    3.6365140   8.181870042  -4.34185041  -1.961598  -5.515118
## stearic        0.6269384 -4.341850411   23.87359866 -21.244717    1.716108
## oleic         -111.3530007 -1.961598321 -21.24471659  317.543997 -169.350768
## linoleic       28.1650010 -5.515117910    1.71610813 -169.350768  140.573371
## eicosanoic     -0.3036901 -0.622914296    0.42047044  -3.140478    2.545714
## linolenic      1.7397218 -0.003074716   -0.80686608   -5.522402    2.811557
## eicosenoic     -1.0475553 -0.147657826    0.04814726   -2.060295    2.116408
##      eicosanoic linolenic eicosanoic
## palmitic     -0.3036901   1.739721801 -1.04755534
## palmitoleic  -0.6229143  -0.003074716 -0.14765783
## stearic       0.4204704  -0.806866075   0.04814726
## oleic        -3.1404776  -5.522401651  -2.06029489
## linoleic      2.5457145   2.811557155   2.11640804
## eicosanoic    0.8549886   0.273614050   0.21798168
## linolenic     0.2736140   0.908534000   0.29848845
## eicosenoic    0.2179817   0.298488451   0.81557543
##
## $T2
## [1] 352.5722
##
## $F_stat
## [1] 38.46242
##
## $p_value
## [1] 2.975398e-14
```

## Analysis for Region 4

words

```
## $mean
##      palmitic palmitoleic      stearic      oleic      linoleic eicosanoic
```

```

## 1229.00485    105.29473    273.31700    7359.15499    834.72222    42.28743
##   linolenic  eicosenoic
##    75.89850    37.76324
##
## $total_variance
##           palmitic palmitoleic      stearic      oleic      linoleic
## palmitic      897.74220  209.816373  -83.2051369 -1526.41935  426.403920
## palmitoleic   209.81637   65.569374  -29.7454279  -385.56689  115.806335
## stearic       -83.20514  -29.745428   64.8806452   164.27609 -111.775525
## oleic        -1526.41935 -385.566891  164.2760923  3181.05148 -1210.624434
## linoleic      426.40392  115.806335  -111.7755246 -1210.62443  694.083510
## eicosanoic   -11.40085   -3.901047   5.2309958   17.32790   -7.648859
## linolenic     35.45592    9.195726   -6.2975653  -71.11265   26.030260
## eicosenoic   -12.40019   -2.237210   0.3988072   10.70765    1.110763
##           eicosanoic  linolenic  eicosenoic
## palmitic   -11.4008500  35.4559206 -12.4001937
## palmitoleic -3.9010470   9.1957263  -2.2372099
## stearic     5.2309958  -6.2975653   0.3988072
## oleic       17.3279020 -71.1126536  10.7076525
## linoleic    -7.6488586  26.0302596   1.1107631
## eicosanoic   0.6767097  -0.3921222   0.2263221
## linolenic   -0.3921222   3.4648483   0.4131747
## eicosenoic   0.2263221   0.4131747   2.0505849
##
## $T2
## [1] 530.1991
##
## $F_stat
## [1] 53.01991
##
## $p_value
## [1] 1.487699e-14

```

## Comparison between Regions 2 and 4

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## Assessment of Linoleic and Linolenic Acids

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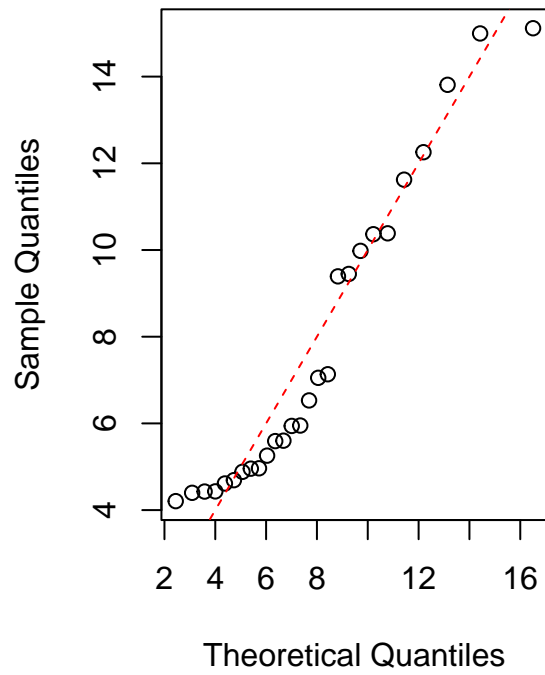
## Conclusions and Recommendations

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## Appendix

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**MVN Q-Q Plot 2a**



**MVN Q-Q Plot 4a**

