Midterm Result

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Input dataset

Exploratory analysis and data visualization

In this section, use appropriate visualization techniques to explore the dataset and identify any patterns or relationships in the data.

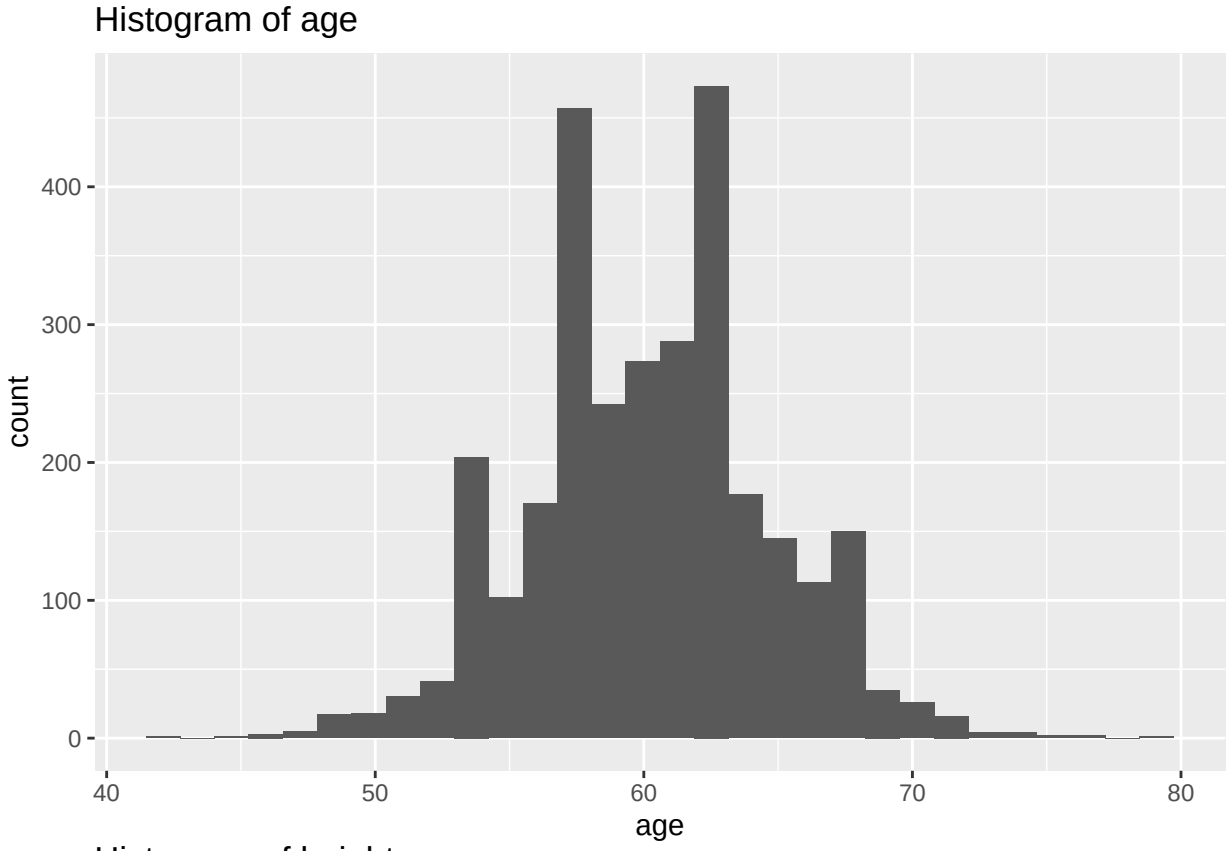
Summary statistics

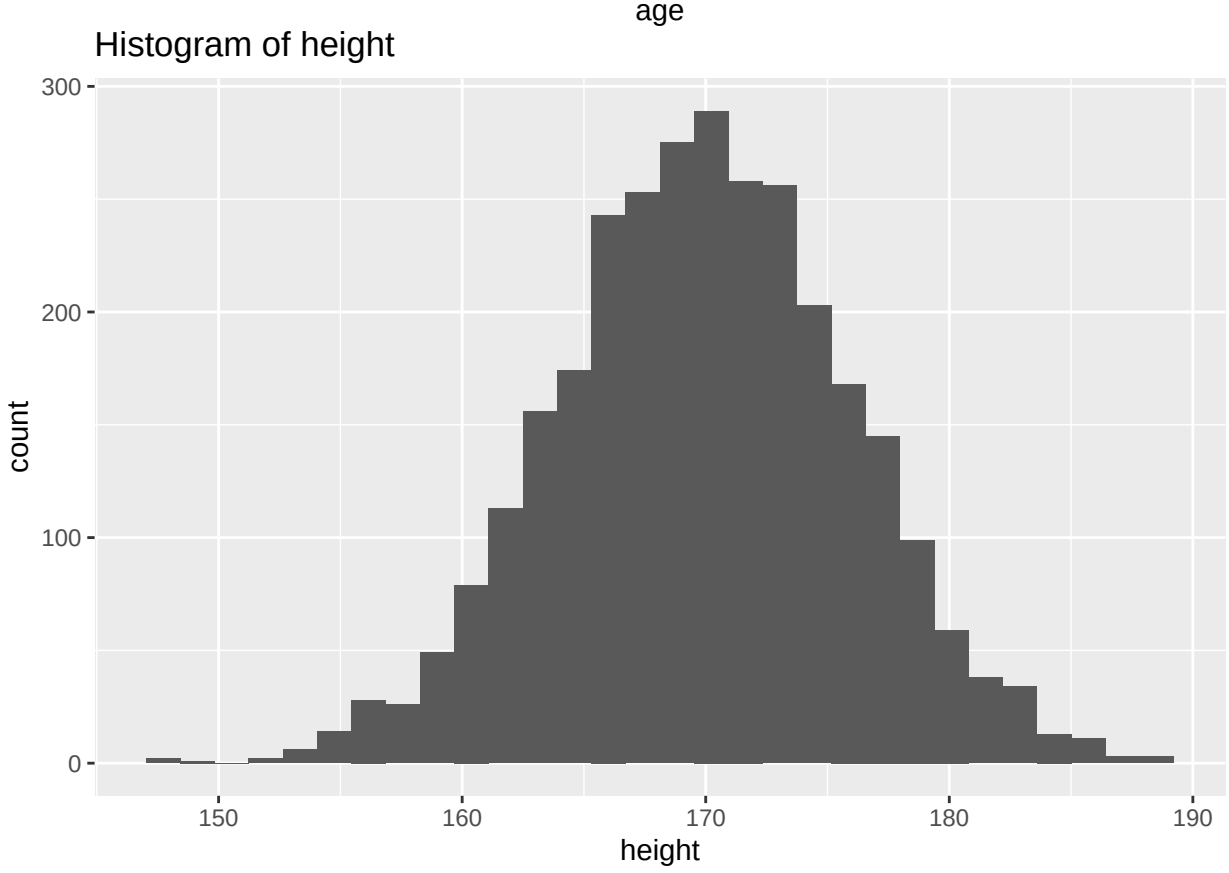
Table 1: Summary of Dataset

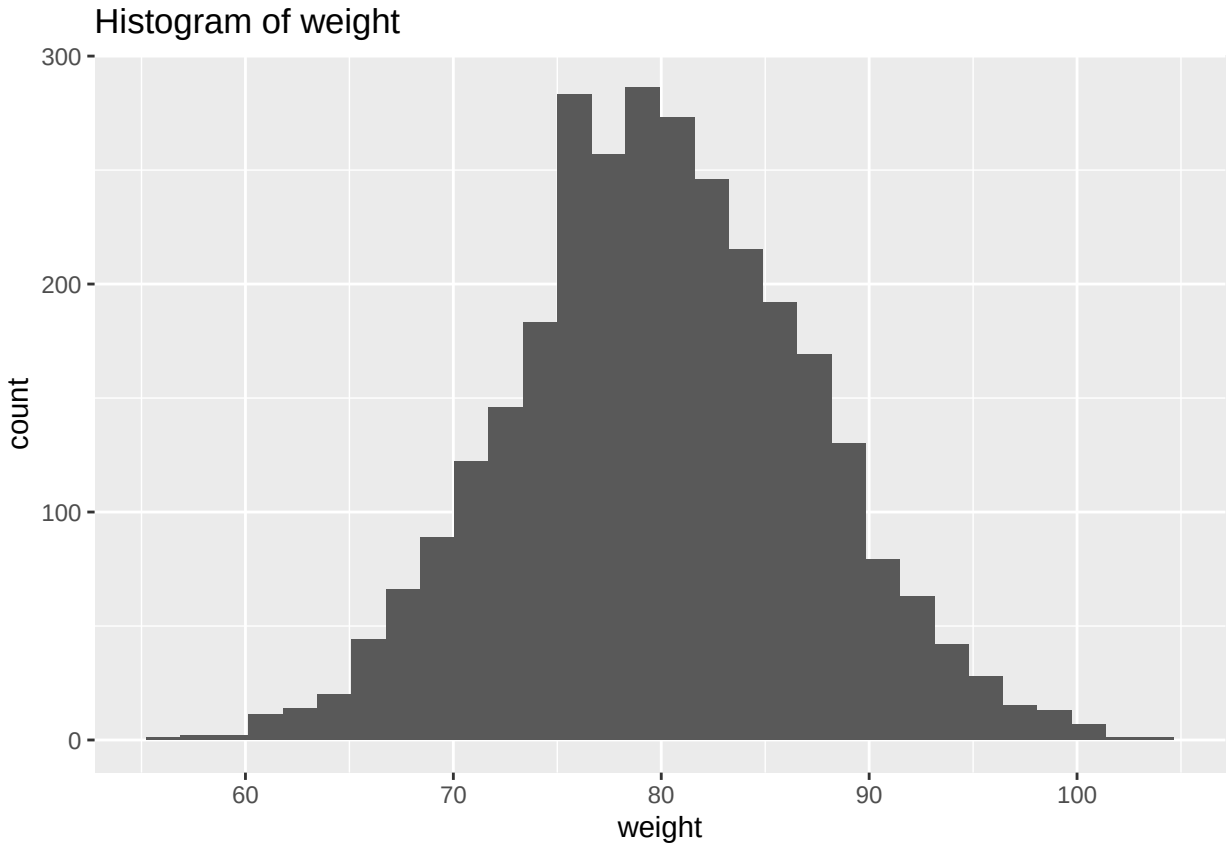
Characteristic	**N = 3,000**[1]
age	60.0 (57.0, 63.0)
gender	
male	1,544 (51%)
female	1,456 (49%)
race	
White	1,967 (66%)
Asian	158 (5.3%)
Black	604 (20%)
Hispanic	271 (9.0%)
smoking	
Never smoked	1,822 (61%)
Former smoker	859 (29%)
Current smoker	319 (11%)
height	169.9 (166.0, 173.9)
weight	80 (75, 85)
bmi	27.65 (25.80, 29.50)
hypertension	1,492 (50%)
diabetes	463 (15%)
SBP	130 (125, 136)
LDL	110 (97, 124)
vaccine	
Not vaccinated	1,212 (40%)
Vaccinated	1,788 (60%)
severity	
Not severe	2,679 (89%)
Severe	321 (11%)
study	
A	2,000 (67%)
B	1,000 (33%)
recovery_time	39 (31, 49)

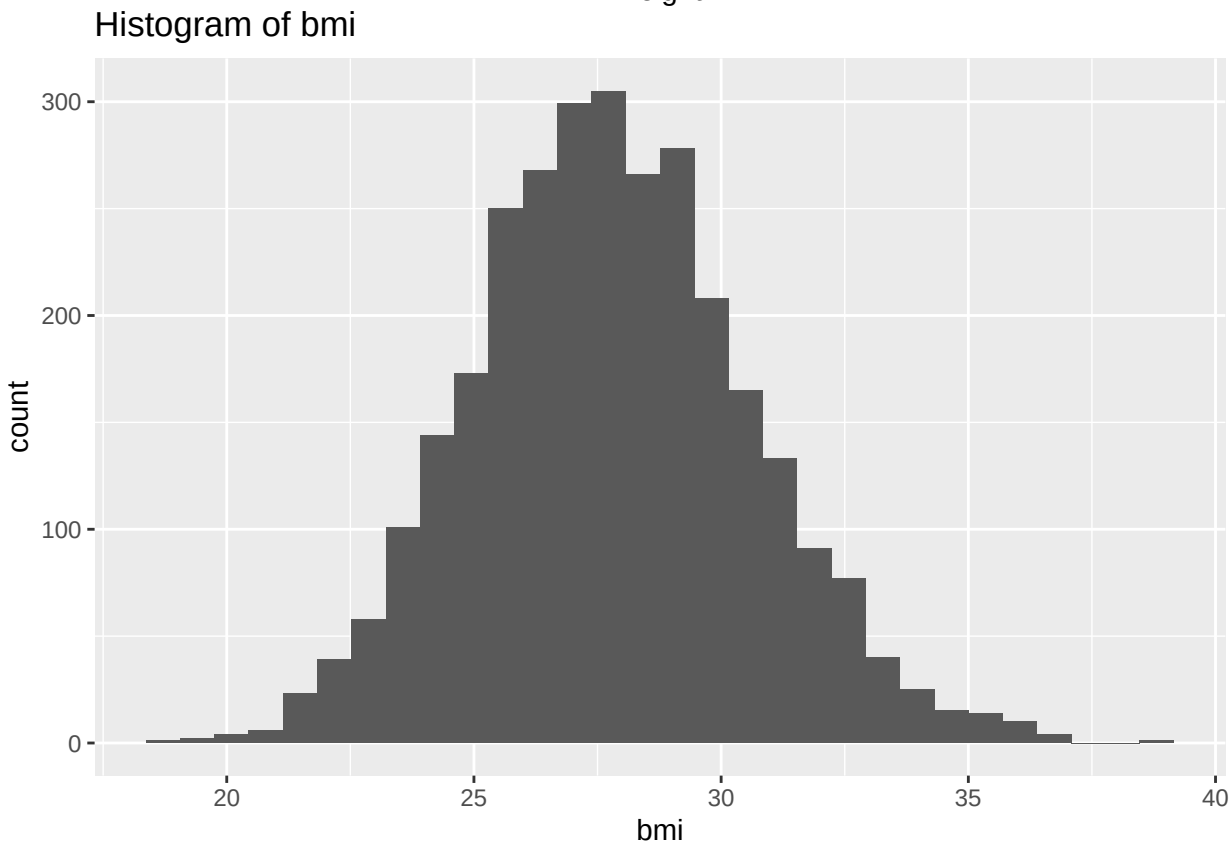
[1] Median (IQR); n (%)

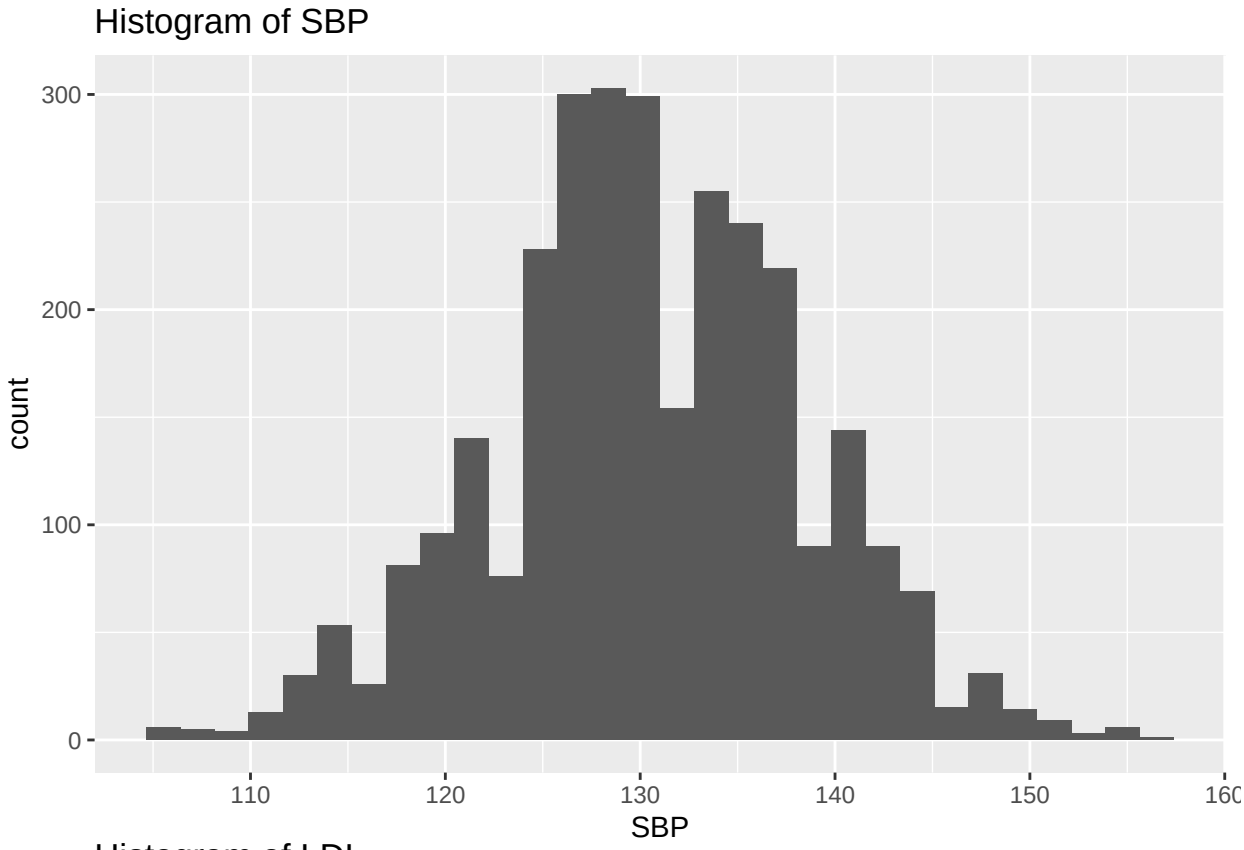
Visualizations for the numerical variables

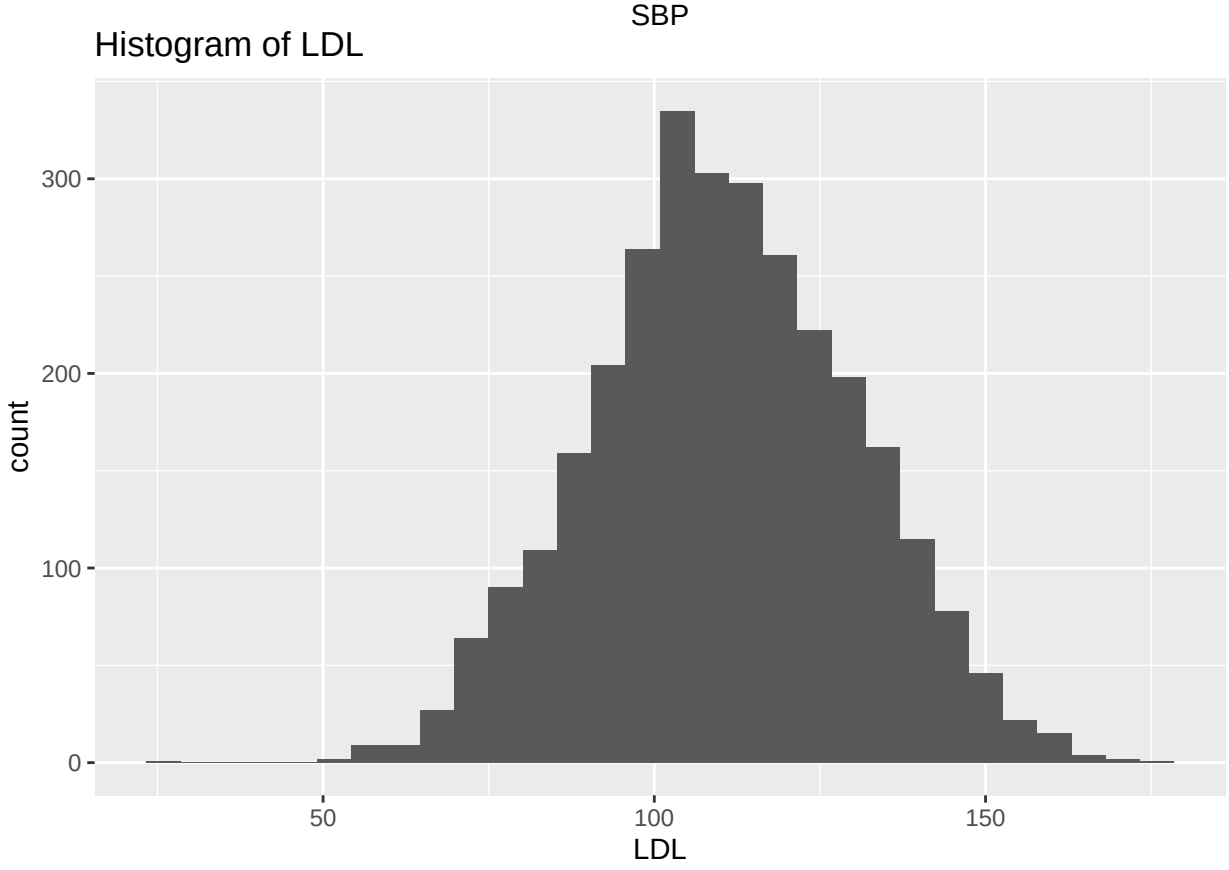


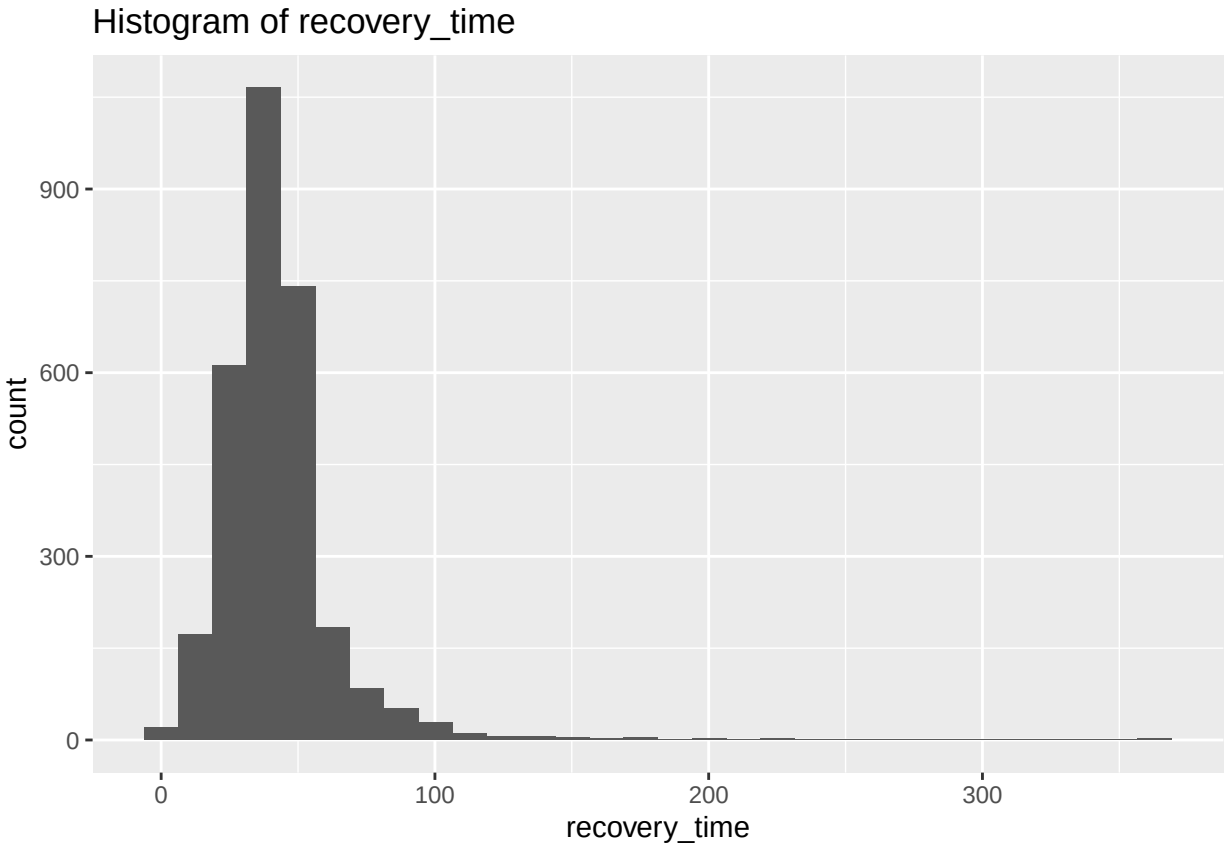



Histogram of weight
count
weight
300
200
100
0
60
70
80
90
100

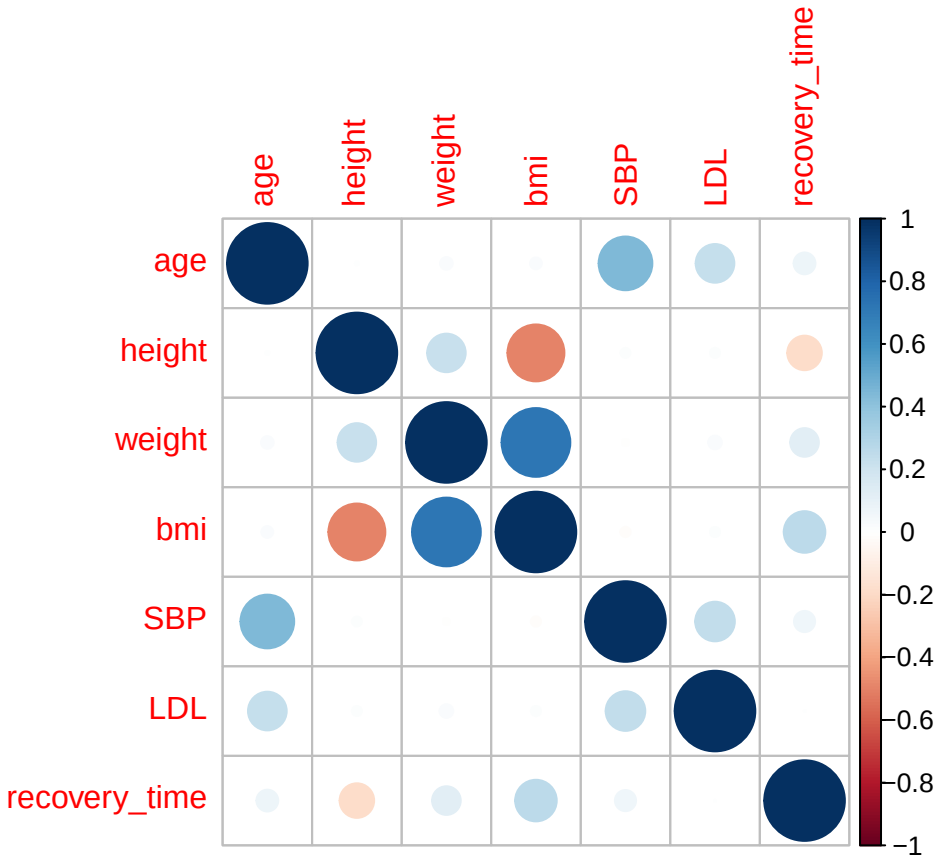

Histogram of bmi
count
bmi
300
200
100
0
20
25
30
35
40


Histogram of SBP
count
300
200
100
0
110
120
130
140
150
160
SBP


Histogram of LDL
count
300
200
100
0
50
100
150
LDL



correlation plot



Model training

In this section, describe the models you used to predict the time to recovery from COVID-19. Briefly state the assumptions made by using the models. Provide a detailed description of the model training procedure and how you obtained the final model.

MARS

GAM

lasso

Elastic net

ctrl1 <- trainControl(method = "cv", number = 10) tuneGrid = expand.grid(alpha = seq(0, 1, length = 21), lambda = exp(seq(-25, 5, length = 100)))