

# Final-project-draft

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## Intro

In this project, I will gain insight into public health by generating simple graphical and numerical summaries of a data set collected by the collected from different hospitals , community clinics, maternal health cares through the IoT based risk monitoring system.

## What

I would like to determine the risk level of pregnant women of 18 and less. To help me, I will be using a data set from Kaggle.

## Why

It is important to know if they are on high risk level so that we can make some sensitization and also work on how to find some solution to protect them and fight against those condition

## How

I will use R Markdown to determine the rate. I would like to go further by determining Which health conditions are the strongest indications for health risks during pregnancy?

## Body

The purpose of this will be to analyse and calculate the risk level faced by pregnant women under the age of 18 and know which category of the conditions affect them the most . By doing this study we can learn and try to protect their pregnancy .The different attributes are : Systolic BP: Upper value of Blood Pressure in mmHg, another significant attribute during pregnancy.

Diastolic BP: Lower value of Blood Pressure in mmHg, another significant attribute during pregnancy.

BS: Blood glucose levels is in terms of a molar concentration, mmol/ L. Heart Rate: A normal resting heart rate in beats per minute .

Risk Level: Predicted Risk Intensity Level during pregnancy considering the previous attribute.

## study of the Data

```
library(readxl)
```

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

```
setwd('C:/Users/kamag/Downloads/')  
MAT <- read_excel("MAT.xlsx")  
library(Hmisc)
```

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

```
## Loading required package: lattice
```

```
## Loading required package: survival
```

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

```
## Loading required package: Formula
```

```
## Loading required package: ggplot2
```

```
## Warning: package 'ggplot2' was built under R version 4.1.3
```

```
##
```

```
## Attaching package: 'Hmisc'
```

```
## The following objects are masked from 'package:base':
```

```
##
```

```
##      format.pval, units
```

```
describe(MAT)
```

```
## MAT
```

```
##
```

```
## 7 Variables      1014 Observations
```

```
## -----
```

```
## Age
```

	n	missing	distinct	Info	Mean	Gmd	.05	.10
##	1014	0	50	0.998	29.87	14.93	13.65	15.00
##	.25	.50	.75	.90	.95			
##	19.00	26.00	39.00	50.00	55.00			

```
##
```

```
## lowest : 10 12 13 14 15, highest: 62 63 65 66 70
```

```
## -----
```

```
## SystolicBP
```

	n	missing	distinct	Info	Mean	Gmd	.05	.10
##	1014	0	19	0.907	113.2	20	85	90
##	.25	.50	.75	.90	.95			
##	100	120	120	140	140			

```
##
```

```

## lowest : 70 75 76 78 80, highest: 129 130 135 140 160
##
## Value      70    75    76    78    80    83    85    90    95    99   100
## Frequency   7     8    16     3     5     2    43   154   12     2    92
## Proportion 0.007 0.008 0.016 0.003 0.005 0.002 0.042 0.152 0.012 0.002 0.091
##
## Value      110   115   120   129   130   135   140   160
## Frequency   19     8   449     1    60     3   120    10
## Proportion 0.019 0.008 0.443 0.001 0.059 0.003 0.118 0.010
## -----
## DiastolicBP
##      n missing distinct      Info      Mean      Gmd      .05      .10
##   1014      0      16    0.978    76.46    15.8      60      60
##    .25    .50    .75    .90    .95
##     65     80     90     95    100
##
## lowest : 49 50 60 63 65, highest: 85 89 90 95 100
##
## Value      49    50    60    63    65    68    69    70    75    76    80
## Frequency   25    24   174     8    87     2     1   100   38     3   226
## Proportion 0.025 0.024 0.172 0.008 0.086 0.002 0.001 0.099 0.037 0.003 0.223
##
## Value      85    89    90    95   100
## Frequency   49     1   153    36    87
## Proportion 0.048 0.001 0.151 0.036 0.086
## -----
## BS
##      n missing distinct      Info      Mean      Gmd      .05      .10
##   1014      0      29    0.991    8.726    2.979    6.10    6.70
##    .25    .50    .75    .90    .95
##    6.90    7.50    8.00   15.00   17.35
##
## lowest : 6.0 6.1 6.3 6.4 6.5, highest: 15.0 16.0 17.0 18.0 19.0
## -----
## BodyTemp
##      n missing distinct      Info      Mean      Gmd
##   1014      0      8     0.5    98.67    1.098
##
## lowest : 98.0 98.4 98.6 99.0 100.0, highest: 99.0 100.0 101.0 102.0 103.0
##
## Value      98.0 98.4 98.6 99.0 100.0 101.0 102.0 103.0
## Frequency   804     2     1    10    20    98    66    13
## Proportion 0.793 0.002 0.001 0.010 0.020 0.097 0.065 0.013
## -----
## HeartRate
##      n missing distinct      Info      Mean      Gmd      .05      .10
##   1014      0      16    0.975    74.3    8.653      60      66
##    .25    .50    .75    .90    .95
##     70     76     80     86     88
##
## lowest : 7 60 65 66 67, highest: 80 82 86 88 90
##
## Value      7    60    65    66    67    68    70    75    76    77    78
## Frequency   2    74     5    87    12     2   271   19   131   96   46

```

```
## Proportion 0.002 0.073 0.005 0.086 0.012 0.002 0.267 0.019 0.129 0.095 0.045
##
## Value      80      82      86      88      90
## Frequency   117     19     55     59     19
## Proportion 0.115 0.019 0.054 0.058 0.019
## -----
## RiskLevel
##      n missing distinct
##  1014      0         3
##
## Value      high risk  low risk  mid risk
## Frequency      272     406     336
## Proportion    0.268    0.400    0.331
## -----
```

In this that data we have 7 variable for 1014 Oobservation

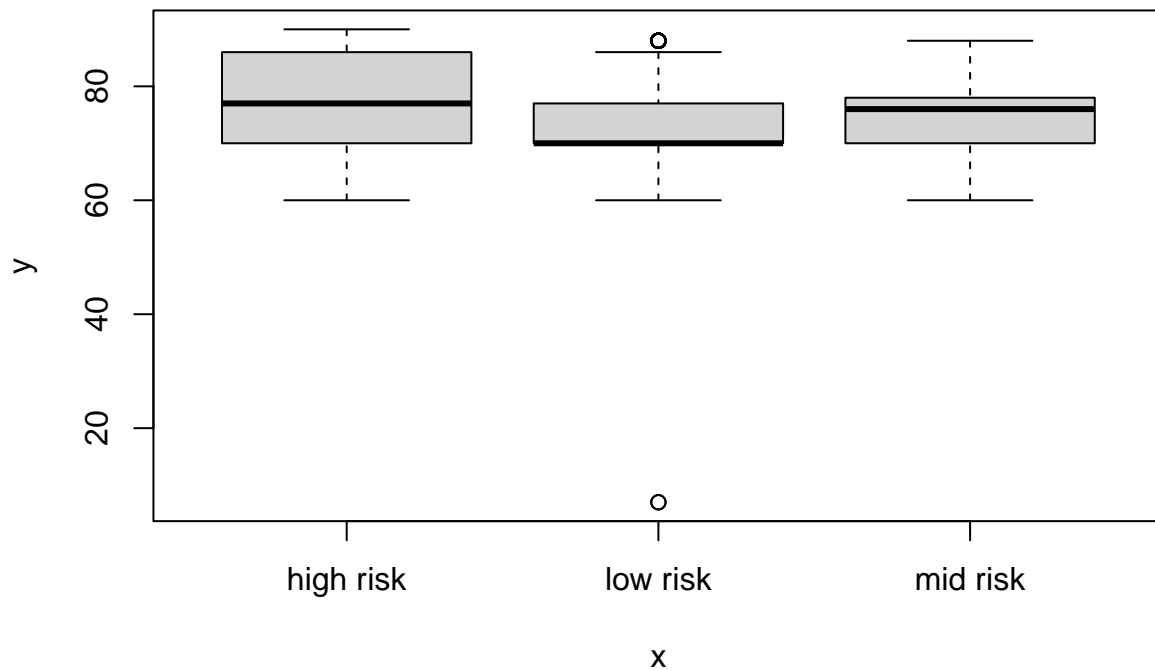
## Distribution of Risk Level

```
table(MAT$RiskLevel)
```

```
##
## high risk  low risk  mid risk
##      272     406     336
```

We know from the distribution that most of the pregnant women have A low risk conditions .

```
RiskLevel <- table(MAT$RiskLevel)
plot(as.factor(MAT$RiskLevel),MAT$HeartRate)
```



```
anova(aov(HeartRate ~ RiskLevel, data=MAT))
```

```
## Analysis of Variance Table
##
## Response: HeartRate
##           Df Sum Sq Mean Sq F value    Pr(>F)
## RiskLevel   2  2577 1288.67  20.453 1.961e-09 ***
## Residuals 1011  63700   63.01
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
head(MAT)
```

```
## # A tibble: 6 x 7
##   Age SystolicBP DiastolicBP BS BodyTemp HeartRate RiskLevel
##   <dbl>      <dbl>      <dbl> <dbl>    <dbl>    <dbl> <chr>
## 1    25        130         80  15      98      86 high risk
## 2    35        140         90  13      98      70 high risk
## 3    29         90         70   8     100      80 high risk
## 4    30        140         85   7      98      70 high risk
## 5    35        120         60  6.1     98      76 low risk
## 6    23        140         80  7.01    98      70 high risk
```

```
tail(MAT)
```

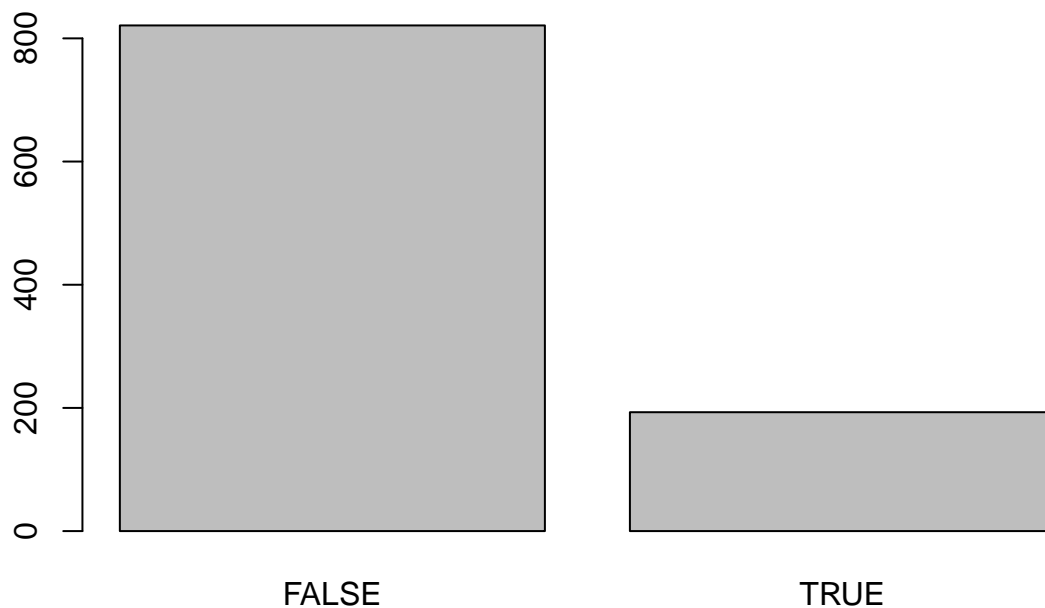
```
## # A tibble: 6 x 7
##   Age SystolicBP DiastolicBP   BS BodyTemp HeartRate RiskLevel
##   <dbl>      <dbl>      <dbl> <dbl>    <dbl>    <dbl> <chr>
## 1    48        120        80    11      98      88 high risk
## 2    22        120        60    15      98      80 high risk
## 3    55        120        90    18      98      60 high risk
## 4    35         85        60    19      98      86 high risk
## 5    43        120        90    18      98      70 high risk
## 6    32        120        65     6     101      76 mid risk
```

## Pregnant women under 18

```
table(MAT$Age<18)
```

```
##
## FALSE  TRUE
##   821   193
```

```
Age <- table(MAT$Age<18)
barplot(Age)
```



## Pregnant women under 18 with high risk level

```
ltage18 <- subset(MAT, Age<18)
ltage18
```

```
## # A tibble: 193 x 7
##   Age SystolicBP DiastolicBP   BS BodyTemp HeartRate RiskLevel
##   <dbl>      <dbl>      <dbl> <dbl>   <dbl>      <dbl> <chr>
## 1    15         120         80  7.01     98         70 low risk
## 2    10          70         50  6.9      98         70 low risk
## 3    16         100         70  7.2      98         80 low risk
## 4    12          95         60  6.1     102         60 low risk
## 5    15          76         49  7.5      98         77 low risk
## 6    15         120         80  7        98         70 low risk
## 7    15          76         49  6.4      98         77 low risk
## 8    15         120         80  7.2      98         70 low risk
## 9    15          80         60  7        98         80 low risk
## 10   12          95         60  7.2      98         77 low risk
## # ... with 183 more rows
```

```
MAT$RiskLevel == "high risk"
```

```
##   [1] TRUE TRUE TRUE TRUE FALSE TRUE FALSE TRUE FALSE TRUE FALSE FALSE
##  [13] FALSE FALSE FALSE FALSE TRUE TRUE FALSE FALSE TRUE FALSE FALSE FALSE
##  [25] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [37] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [49] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [61] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [73] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [85] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
##  [97] FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE TRUE TRUE TRUE TRUE
## [109] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
## [121] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
## [133] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE FALSE TRUE FALSE FALSE FALSE
## [145] FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE
## [157] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE
## [169] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE TRUE TRUE TRUE FALSE
## [181] FALSE TRUE TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE
## [193] TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE
## [205] FALSE TRUE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE
## [217] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
## [229] TRUE FALSE TRUE TRUE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
## [241] TRUE TRUE FALSE FALSE FALSE TRUE FALSE FALSE TRUE TRUE FALSE FALSE
## [253] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE
## [265] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE TRUE TRUE FALSE
## [277] TRUE TRUE TRUE TRUE FALSE FALSE FALSE FALSE FALSE TRUE FALSE TRUE
## [289] FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE
## [301] FALSE TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
## [313] FALSE FALSE FALSE FALSE TRUE TRUE FALSE TRUE TRUE FALSE FALSE FALSE
## [325] FALSE FALSE FALSE TRUE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE
## [337] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE
## [349] TRUE FALSE FALSE FALSE FALSE TRUE TRUE TRUE TRUE FALSE FALSE FALSE
```

[illegible]



```
## [1009] TRUE TRUE TRUE TRUE TRUE FALSE
```

```
hr <- MAT$RiskLevel == "high risk"
hr <- subset(MAT, MAT$RiskLevel == "high risk")
p18_highrisk <- subset(ltage18, ltage18$RiskLevel == "high risk")
```

From the research above we can see that 37 seven person out 272 from the list of women under 18 are in high risk . This represent 13% of the list . It's a small percentage but it is still not to be be neglected.

## Study of the different condition

### DiastolicBP

```
summary(MAT$DiastolicBP)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  49.00   65.00   80.00   76.46   90.00  100.00
```

### systolicBP

```
summary(MAT$SystolicBP)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   70.0   100.0   120.0  113.2   120.0   160.0
```

### BS

```
summary(MAT$BS)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   6.000   6.900   7.500   8.726   8.000   19.000
```

### Heart Rate

```
summary(MAT$HeartRate)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    7.0   70.0   76.0   74.3   80.0   90.0
```

## Topics From Class

### Rmarkdown:

One of my favorite things to use this semester, it is my first semester in Business Analytics I was scared at the beginning but really after having one class I really loved it.

## **Github:**

This is an also something I enjoy learning I did not go yet as far I wanted to go for now but I will like to learn more about it. ## HMISC package: I used the package hmisc to describe the Data have and more incite of the Data.

## **Anova:**

I used this topics from the suggestion of one of the student and it came out great. It really help me have create a great visualisation .

## **Data subsetting:**

This one of my favorite I really enjoy using it in my homeworks so I decide to use it for my project and it really me acheive what I was looking for.

## **Conclusion**

This project help me learn a lot , it help me surpass myself and succeed my research. It help me learn new function also go back to what I learned in class and study them more. It help me advance my knowledge This is my first semester ,I was scared at beginning but i learned that nothing is too hard or too easy we just have be ready to work harder.

## **Citation:**

HMISC: Donovan, K. (2019, July 11). Data Analysis and processing with R based on Ibis Data. 9 Documenting your results with R Markdown. Retrieved May 8, 2022, from [https://bookdown.org/kdonovan125/ibis\\_data\\_analysis\\_r4/documenting-your-results-with-r-markdown.html](https://bookdown.org/kdonovan125/ibis_data_analysis_r4/documenting-your-results-with-r-markdown.html)