COMP 4060: Assignment 1 Part 5 Report

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```r
# required libraries
library(tidyverse)
library(ggplot2)
```

R calculations for Mean and Standard Deviation

```
##    X    Y Hz
## 1  6 1033 10
## 2  7 1017 10
## 3 33 1028 10
## 4 20 1029 10
## 5 44 1031 10
## 6 35 1024 10
```

```
##    X    Y Hz x_diff y_diff xdiff_bar ydiff_bar xdiff_sd ydiff_sd
## 1  6 1033 10     -6     33     -23.4      25.6 15.46466 5.125102
## 2  7 1017 10     -7     17     -23.4      25.6 15.46466 5.125102
## 3 33 1028 10    -33     28     -23.4      25.6 15.46466 5.125102
## 4 20 1029 10    -20     29     -23.4      25.6 15.46466 5.125102
## 5 44 1031 10    -44     31     -23.4      25.6 15.46466 5.125102
## 6 35 1024 10    -35     24     -23.4      25.6 15.46466 5.125102
```

```
##    X    Y Hz x_diff y_diff xdiff_bar.10 ydiff_bar xdiff_sd ydiff_sd
## 1 21 1152  1    -21    152        -33.2     149.9 14.45145 2.685351
## 2 49 1148  1    -49    148        -33.2     149.9 14.45145 2.685351
## 3 41 1146  1    -41    146        -33.2     149.9 14.45145 2.685351
## 4 26 1151  1    -26    151        -33.2     149.9 14.45145 2.685351
## 5 18 1145  1    -18    145        -33.2     149.9 14.45145 2.685351
## 6  7 1150  1     -7    150        -33.2     149.9 14.45145 2.685351
```

```
##    X    Y Hz x_diff y_diff xdiff_bar ydiff_bar xdiff_sd ydiff_sd
## 1 69 1014 30    -69     14     -31.3       5.3  24.1893 36.07415
## 2  6 1019 30     -6     19     -31.3       5.3  24.1893 36.07415
## 3 24  903 30    -24    -97     -31.3       5.3  24.1893 36.07415
## 4  9 1012 30     -9     12     -31.3       5.3  24.1893 36.07415
## 5 18 1021 30    -18     21     -31.3       5.3  24.1893 36.07415
## 6 75 1012 30    -75     12     -31.3       5.3  24.1893 36.07415
```

Mean and Standard for Hz = 10

$\bar{x} = -23.4$, $\bar{y} = 25.6$

$sd_x = 15.46466$, $sd_y = 5.125102$

Mean and Standard for Hz = 1

$\bar{x} = -33.2$, $\bar{y} = 149.9$

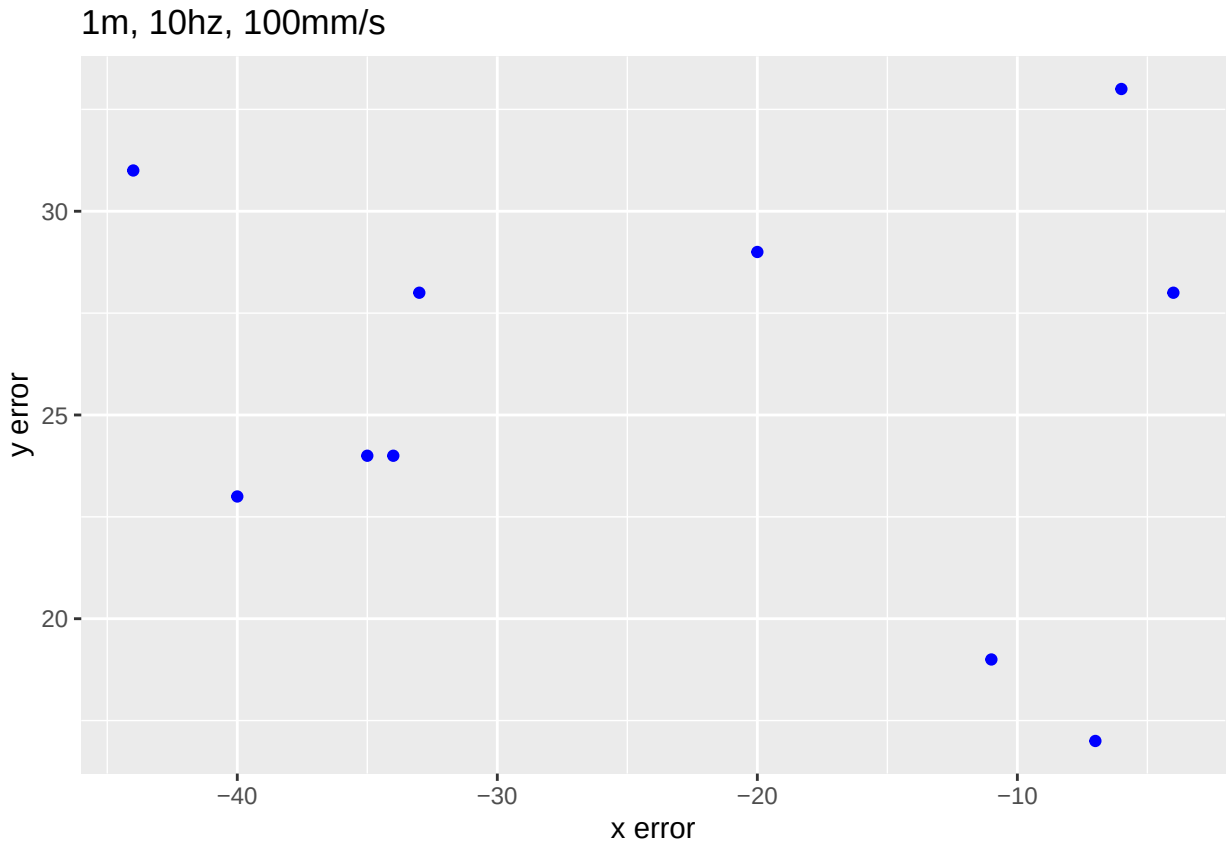
$sd_x = 14.45145$, $sd_y = 2.685351$

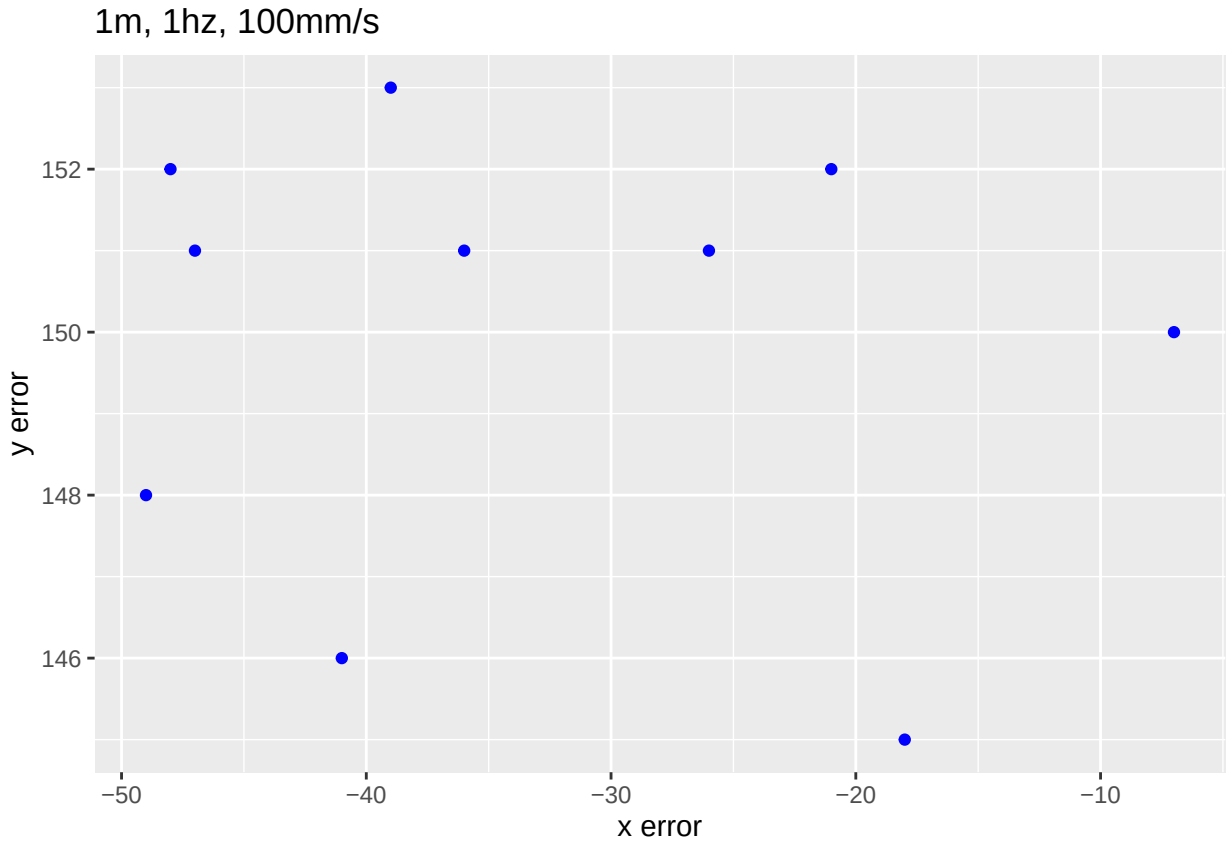
Mean and Standard for Hz = 30

$\bar{x} = -31.3$, $\bar{y} = 5.3$

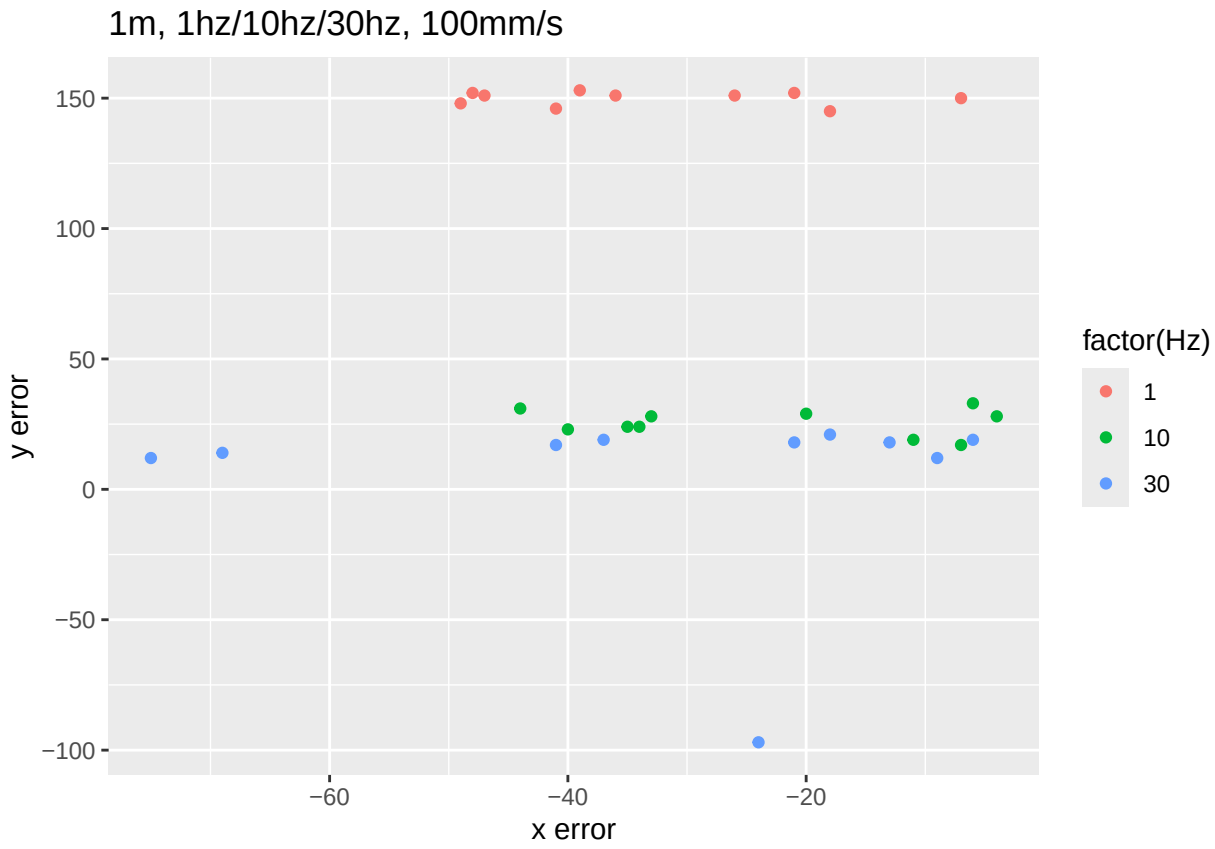
$sd_x = 24.1893$, $sd_y = 36.07415$

Scatter Plots






1m, 30hz, 100mm/s
25
0
−25
−50
−75
−100
y error
−60
−40
−20
x error


1m, 1hz/10hz/30hz, 100mm/s
150
100
50
0
−50
−100
y error
−60
−40
−20
x error
factor(Hz)
1
10
30