Assignment 1

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```
# Part 1

# a
# Generate 5 random digits from 0 to 9 and store it in vector _1.
(v_1 <- trunc(runif(5, 0, 9)))
```

```
[1] 4 5 1 7 7
```

```
# A sequence _2 starting at 1 and ending at 20, with an increment of 3.
(v_2 <- seq(1,20,3))
```

```
[1]  1  4  7 10 13 16 19
```

```
# A vector _3 repeating the number 7, ten times.
(v_3 <- rep(7, 10))
```

```
 [1] 7 7 7 7 7 7 7 7 7 7
```

```
# b
# combine v_1, v_2, and v_3 into a single vector
(v <- c(v_1, v_2, v_3))
```

```
 [1]  4  5  1  7  7  1  4  7 10 13 16 19  7  7  7  7  7  7  7  7  7  7
```

```
# c
# Remove all numbers greater than 10 from vector
# save the result in vector
(w <- v[v<=10]) # for getting the sub list
```

```
 [1]  4  5  1  7  7  1  4  7 10  7  7  7  7  7  7  7  7  7
```

```
# d
v
```

```
 [1]  4  5  1  7  7  1  4  7 10 13 16 19  7  7  7  7  7  7  7  7  7  7
```

```
w
```

```
 [1]  4  5  1  7  7  1  4  7 10  7  7  7  7  7  7  7  7  7
```

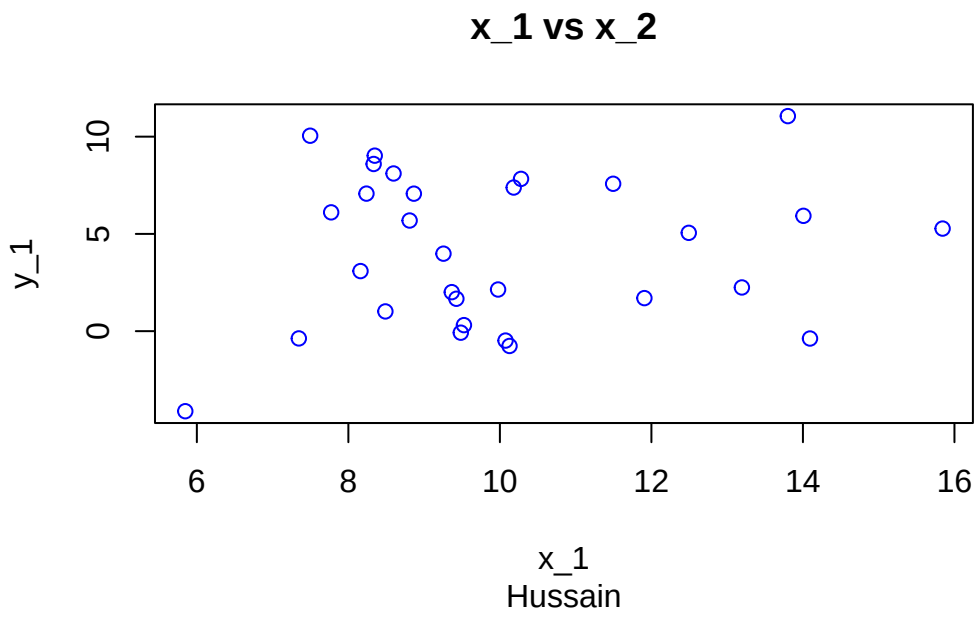
```
# Part 2

# a
n = 30
# Generate random vector x_1 from normal distribution with
# mean = 10 and var = 4
(x_1 <- rnorm(n, mean = 10, sd = 2))
```

```
 [1]  5.847118 11.494865 14.006256  9.525222 15.843586  8.238468  9.255091
 [8] 11.907254  8.160133 14.093137  9.364858  7.772889 10.074481  8.596261
[15] 10.182125  9.483864 13.194262  8.808504  8.333534  8.864306 12.492908
[22] 13.800760  8.488482  9.976039 10.127101  9.425266  8.348086  7.495588
[29] 10.278864  7.346045
```

```
# b
# Generate random vector x_2 = 3 + y where y has normal distribution with
# mean = 0 and variance = 25
(x_2 = 3 + rnorm(n, mean = 0, sd = 5))
```

```
 [1] -4.11668433  7.57744709  5.92938100  0.30970423  5.27386868  7.07187667
 [7]  3.98482515  1.69918333  3.08959316 -0.37822165  2.00553412  6.10821197
[13] -0.48386330  8.10696321  7.38498844 -0.07868016  2.24673460  5.68897557
[19]  8.59532023  7.06889328  5.05500356 11.05687731  1.01478589  2.14208731
[25] -0.76054407  1.66592594  9.02308323 10.04862132  7.82894782 -0.37365261
```

```r
# c
# Make the scatter plot  _1 versus  _2, using the plot function and color blue.
# Use suitable title (including your name as subtitle) and   and   axis labels
plot(x_1, x_2,
    col = "blue",
    main = "x_1 vs x_2",
    sub = "Hussain",
    xlab = "x_1",
    ylab = "y_1",
    )
# d
# Add the line   = 2.8 + 2.7  to the plot of part (c) and color red
abline(a = 2.8, b = 2.7, col = "red") # plot out of range
```




```r
plot(x_1, x_2,
    col = "blue",
    main = "x_1 vs x_2",
    sub = "Hussain",
    xlab = "x_1",
    ylab = "y_1",
    ylim = c(-10,40))
```

```r
abline(a = 2.8, b = 2.7, col = "red")


# e
# Add suitable legend into your plot
legend("topleft",
       legend = c("Data points", "y = 2.8 + 2.7x"),
       col = c("blue", "red"),
       pch = c(1, NA), # for the data point
       lty = c(NA, 1), # for the line
       cex = 0.6, # for reducing the font size
       bty = "n" # removing the box
       )
```