

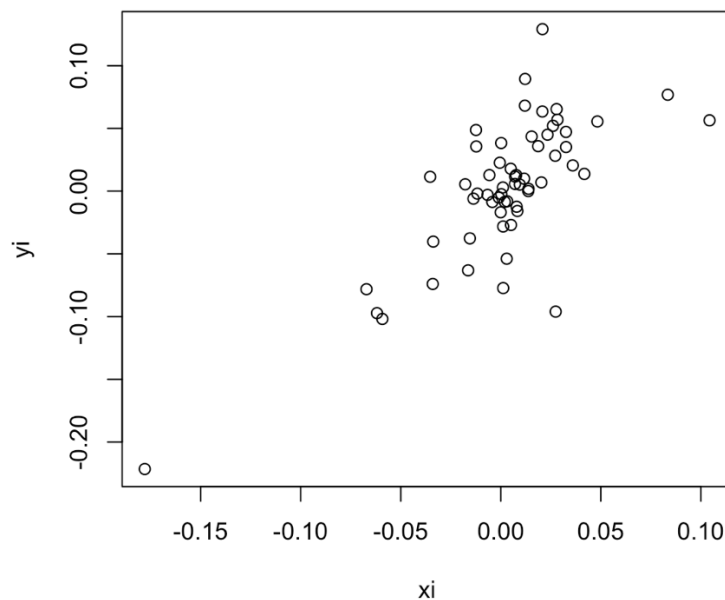
Question 1

- a) A linear model seems appropriate. Also, it seems there is positive linear relationship between x_t and y_t . Furthermore, there is an outlier located on the left bottom of the graph.

```
# Question 1
setwd("~/Desktop/STAT 371/a1")
capmA1=read.csv("capmA1.csv",header = TRUE)
attach(capmA1)

n <- length(BMO)
shortBMO <- BMO[1:n-1]
rt <- diff(BMO)/shortBMO
allrft <- (GVTB10y/100 + 1)^(1/12) - 1
rft <- allrft[-1]
shortTSX <- TSX[1:n-1]
rmt <- diff(TSX)/shortTSX

# a)
yi <- rt-rft
xi <- rmt-rft
plot(xi,yi)
```



- b) The correlation coefficient, r , is 0.7492931.

```
# b)
r <- cor(xi,yi)
r
sxx <- sum(xi^2) - sum(xi)^2 / 59
```

```

syy <- sum(yi^2) - sum(yi)^2 / 59
sxy <- sum(xi*yi) - (sum(xi)*sum(yi)) / 59
rdefinition <- sxy/(sqrt(sxx*syy))

```

c)

Call:

```
lm(formula = yi ~ xi)
```

Residuals:

	Min	1Q	Median	3Q	Max
	-0.125798	-0.019106	-0.001494	0.019939	0.106763

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-0.0009605	0.0048659	-0.197	0.844
xi	1.1192934	0.1310296	8.542	8.7e-12 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.03725 on 57 degrees of freedom

Multiple R-squared: 0.5614, Adjusted R-squared: 0.5537

F-statistic: 72.97 on 1 and 57 DF, p-value: 8.703e-12

```

# c)
model <- lm(yi ~ xi)
summary(model)

```