

Paul Kogan-HW4

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```
pacman::p_load(ISwR)
rjct <- function(lvl) paste("<= alpha =", lvl,
  "so reject the null\n\t\t\t\t\tthypothesis that the")
conc <- function(test, hyp, lvl = 1 - attr(test$conf.int, "conf.level"),
  f = T) {
  lvl <- ifelse(length(lvl) == 0, 0.05, lvl)
  val <- test$p.value
  str <- paste("conclusion: p-value =", val,
    ifelse(val <= lvl, rjct(lvl), rjct(lvl) %>%
      str_replace_all(c("<=" = ">", "so" = "so fail to"))), hyp)
  if (f) cat(str)
  invisible(str)
}
```

1

```
x <- c(2.4, 1.6, 2.0, 2.6, 1.4, 1.6, 2.0, 2.2)
y <- c(225, 184, 220, 240, 180, 184, 186, 215)
fit <- summary.lm(lm(y~x))
m <- fit$coefficients[[2, 1]]
b <- fit$coefficients[[1, 1]]
test <- cor.test(x, y, conf.level = 0.99)
cat("\na\t", cor(x, y),
    "\nb\t y(x) =", paste0(m, "x +"), b,
    "\nc\t", fit$r.squared, "\nd)")
test
conc(test, "correlation between x and y is zero")
cat(paste0("\ne\t $", format(round(1000 * (m * 1.8 + b), 2), nsmall = 2)))
```

```
##
## a)      0.9129053
## b)       $y(x) = 50.7287449392712x + 104.0607$ 
## c)      0.8333961
## d)
## Pearson's product-moment correlation
##
## data:  x and y
## t = 5.4785, df = 6, p-value = 0.001546
## alternative hypothesis: true correlation is not equal to 0
## 99 percent confidence interval:
##  0.3737245 0.9909470
```

```
## sample estimates:
##      cor
## 0.9129053
##
## conclusion: p-value = 0.00154563253699835 <= alpha = 0.01 so reject the null
##      hypothesis that the correlation between x and y is zero
## e)    $195372.47
```

2

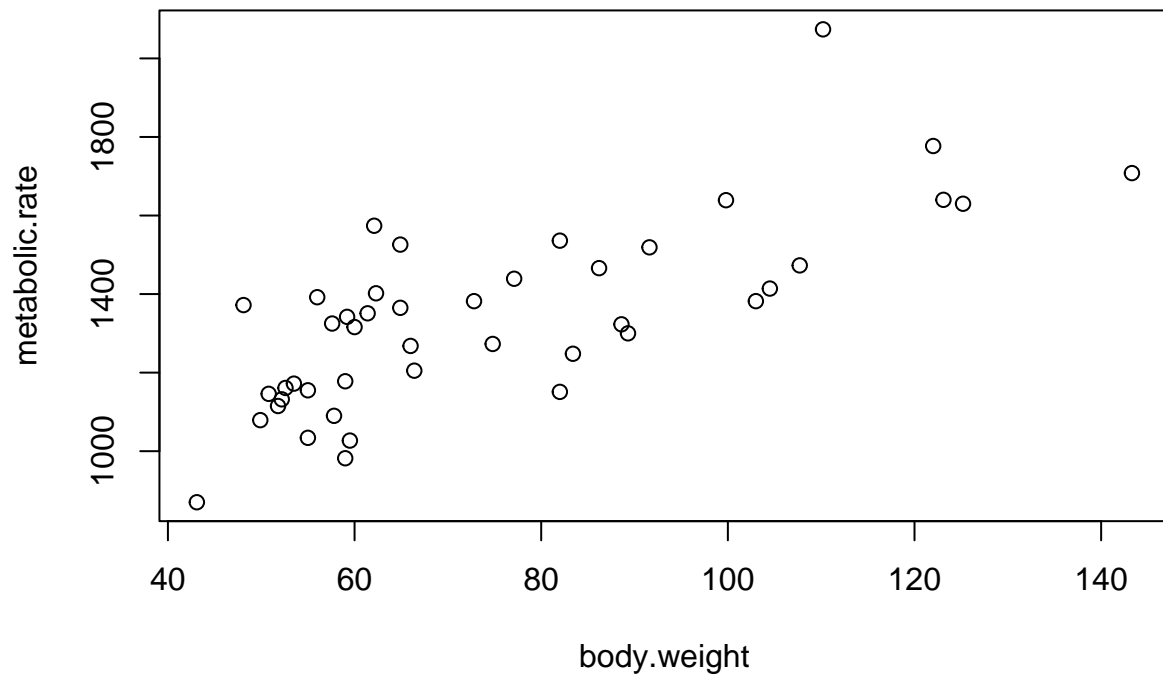
```
data <- read.table("d_logret_6stocks.txt", header = T)
con <- lm(Intel ~ Citigroup, data)
test <- cor.test(data$Citigroup, data$Intel)
cat("\na)\t Intercept:", con$coefficients[[1]],
    "; Citigroup:", con$coefficients[[2]],
    "\nb)\t Citigroup:", lm(Intel ~ 0 + Citigroup, data)$coefficients,
    "\nc)\t Correlation: ", test$estimate)
test
conc(test, "correlation between Intel and Citigroup is zero")
```

```
##
## a)    Intercept: -0.007159523 ; Citigroup: 1.254287
## b)    Citigroup: 1.247231
## c)    Correlation: 0.5740286
## Pearson's product-moment correlation
##
## data: data$Citigroup and data$Intel
## t = 5.5199, df = 62, p-value = 7.085e-07
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## 0.3821398 0.7184618
## sample estimates:
##      cor
## 0.5740286
##
## conclusion: p-value = 7.08541341352561e-07 <= alpha = 0.05 so reject the null
##      hypothesis that the correlation between Intel and Citigroup is zero
```

3

```
library(ISwR)
attach(rmr)
fit <- lm(metabolic.rate ~ body.weight)$coefficients
cat("The predicted rate is", fit[[2]] * 80 + fit[[1]], "for 80kg weight")
plot(body.weight, metabolic.rate, main = "Body Weight vs Metabolic Rate")
```

Body Weight vs Metabolic Rate



The predicted rate is 1375.989 for 80kg weight