

STAT 3355 HW1

2024-01-31

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

Question 1

a)

```
a <- 8 + 9 - 7 / (3^0.3)
print(a)
```

```
## [1] 11.96544
```

b)

```
b <- log (sqrt((15+16)/(14+12)), base = 2)
print(b)
```

```
## [1] 0.1268783
```

c)

```
c <- ((11 + sin(pi/4)) / (factorial(3) + abs(-10)))^2
print(c)
```

```
## [1] 0.5353764
```

d)

```
d <- 6 + 5 - 4/(3^2)
print(d)
```

```
## [1] 10.55556
```

e)

```
e <- exp(sqrt((14 + 13)/(12 + 11)))
print(e)
```

```
## [1] 2.954923
```

f)

```
f <- ((11 + factorial(12))/(factorial(13) + 14))^2
print(f)
```

```
## [1] 0.00591716
```

Question 2

a)

```
RF <- c(2.60, 3.05, 3.74, 3.48, 5.49, 4.25, 2.57, 2.18, 3.14, 4.82, 3.28, 3.01)
```

b)

```
months <- c("Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec")
names(RF) <- months
```

c)

```
avg <- mean(RF)
print(round(avg, digits = 2))
```

```
## [1] 3.47
```

d)

```
min <- which.min(RF)
max <- which.max(RF)
print(min)
```

```
## Aug
## 8
```

```
print(max)
```

```
## May
## 5
```

Question 3

a)

```
H2 <- c(2700, 2600, 3050, 2900, 3000, 2500, 2600, 3000, 2800, 3200, 2800, 3400)
```

b)

```
names(H2) <- months
```

c)

```
total <- sum(H2)
print(total)
```

```
## [1] 34550
```

d)

```
difference <- diff (H2)
min.diff <- which.min(difference)
max.diff <- which.max(difference)
print(min.diff)
```

```
## Jun
## 5
```

```
print(max.diff)
```

```
## Dec
## 11
```

Question 4

a)

```
x <- c(1, -2, 3, -4, 5, 100)
y <- x * -1
y [y > 0]
```

```
## [1] 2 4
```

b)

```
# create a sequence from 1 to 50
z <- seq(1:50)
# test whether an observation is even
even <- z %% 2 == 0
# subset z by the test above
z <- z [even]
```

c)

```
mean <- function(x) {
  sum(x) / length(x)
}
```

Question 5

```
PrintSquare = function(){
  for(i in 1:1000){
    if(sqrt(i) == floor (sqrt(i))){
      print(i)
      i <- i + 1
    }
  }
}
PrintSquare()
```

```
## [1] 1
## [1] 4
## [1] 9
```

```
## [1] 16
## [1] 25
## [1] 36
## [1] 49
## [1] 64
## [1] 81
## [1] 100
## [1] 121
## [1] 144
## [1] 169
## [1] 196
## [1] 225
## [1] 256
## [1] 289
## [1] 324
## [1] 361
## [1] 400
## [1] 441
## [1] 484
## [1] 529
## [1] 576
## [1] 625
## [1] 676
## [1] 729
## [1] 784
## [1] 841
## [1] 900
## [1] 961
```

Question 6

```
prime1 <- 1
prime2 <- 2
sum <- 0
isPrime <- TRUE
TwinPrime <- function(n){
  for(j in 3:n){
    for(k in 2:(j-1)){
      if (j%%k == 0){
        isPrime <- FALSE
      }
      k <- k + 1
    }
    if (isPrime == TRUE){
      prime1 <- prime2
      prime2 <- j
      if (prime2 - prime1 == 2){
        sum <- sum + 1
      }
    }
    j <- j + 1
    isPrime <- TRUE
  }
  return (sum)
```

```
}  
print (TwinPrime(13))
```

```
## [1] 3
```