Class Activity 04

Solutions

2025-02-18

Problem 1

Part a

```
n <- 5
sum(sample(1:n, size = n, replace = F) == 1:n)
```

```
## [1] 0
```

Part b

```
mean(replicate(1000,sum(sample(1:n, size = n, replace = F) == 1:n) > 0))
```

```
## [1] 0.649
```

Part c

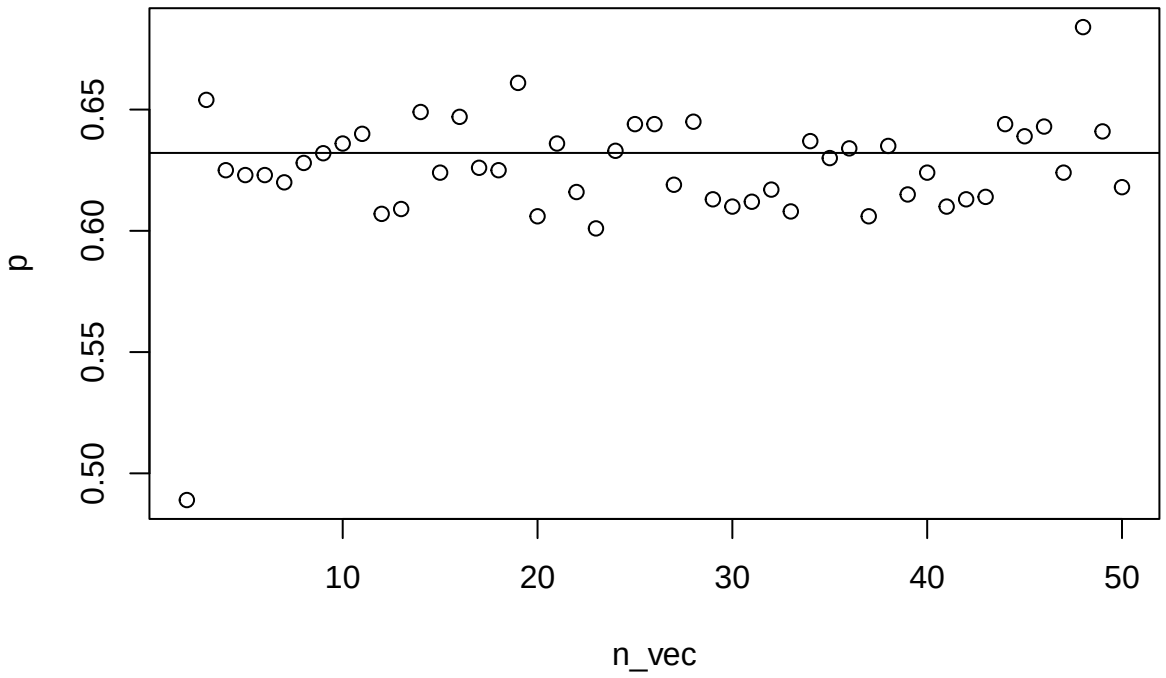
```
prob_match <- function(n, B){
  mean(replicate(B, sum(sample(1:n, size = n, replace = F) == 1:n) > 0))
}
```

Part d

```
n_vec <- 2:50
p <- rep(NA, length(n_vec))
for(i in 1:length(n_vec)){
  p[i] <- prob_match(n_vec[i], 1000)
}
```

Part e

```r
plot(n_vec, p)
abline(h = 1 - exp(-1))
```



Problem 2

Part a

```r
k <- 25
1 - (364/365)^(k-1)
```

```
## [1] 0.06372277
```

Part b

```r
B <- 10000
sum(replicate(B, sum(sample(1:365, size = k - 1, replace = T) == 1) >= 1))/B
```

```
## [1] 0.0662
```

Part c

Type here!