Section_2.4.R

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```
#2.4-1 (a)
x <- c(0,1,1,1,0,1,2,1,4,1,2,3,0,3,0,1,0,1,1,2,3,0,2,2)
#Sample mean
mean(x)
```

```
## [1] 1.333333
```

```
#Sample variance
var(x)
```

```
## [1] 1.275362
```

```
#2.4-3 (a)
x <- c(4,6,6,12,11,11,10,5,10,7,9,6,9,11,9,6,4,9,11,8,10,11,7,4,5,8,6,5,8,7,6,3,4,6,4,12,7,14,5,9,7,10,9
#Sample mean
mean(x)
```

```
## [1] 7.94
```

```
#Sample variance
var(x)
```

```
## [1] 7.73102
```

```
#2.4-3 (b)
#Frequencies of observations
f <- c(sum(x == 3), sum(x == 4), sum(x == 5), sum(x == 6), sum(x == 7), sum(x == 8), sum(x == 9), sum(x
f
```

```
##  [1] 1 5 4 9 6 3 6 5 5 4 1 1
```

```
#Binomial distribution
#f(x)
(function(x){dbinom(x, 301, 0.026379)})(3:14)
```

```
##  [1] 0.02865382 0.05783720 0.09308123 0.12441449 0.14205722 0.14144548
##  [7] 0.12476207 0.09870379 0.07074610 0.04632204 0.02790041 0.01555047
```

```
#nf(x)
(function(x){50*dbinom(x, 301, 0.026379)})(3:14)
```

```
##  [1] 1.4326912 2.8918600 4.6540613 6.2207243 7.1028612 7.0722738 6.2381035
##  [8] 4.9351894 3.5373051 2.3161019 1.3950204 0.7775233
```

```
#Poisson distribution
#f(x)
(function(x){dpois(x, 7.94, log = FALSE)})(3:14)
```

```
##  [1] 0.02971749 0.05898921 0.09367487 0.12396307 0.14060954 0.13955497
##  [7] 0.12311850 0.09775609 0.07056212 0.04668860 0.02851596 0.01617262
```

```
#nf(x)
(function(x){50*dpois(x, 7.94, log = FALSE)})(3:14)
```

```
##  [1] 1.4858743 2.9494605 4.6837433 6.1981536 7.0304771 6.9777485 6.1559248
##  [8] 4.8878043 3.5281060 2.3344301 1.4257981 0.8086312
```

```
#2.4-5 (a)
x <- c(1,1,2,2,2,2,3,3,3,3,3,4,4,4,4,4,4,4,5,5,5,5,5,5,5,5,5,6,6,6,6,6,6,6,6,7,7,7,7,7,8,8,8,9,9)
#Sample mean
mean(x)
```

```
## [1] 4.955556
```

```
#Sample variance
var(x)
```

```
## [1] 4.134343
```

```
#2.4-5 (b)
#Binomial distribution
#nf(x)
(function(x){45*dbinom(x, 30, 0.1652)})(0:9)
```

```
##  [1] 0.1998415 1.1864094 3.4043185 6.2877399 8.3989683 8.6428483 7.1264501
##  [8] 4.8351957 2.7509298 1.3307218
```

```
#Poisson distribution
#nf(x)
(function(x){45*dpois(x, 4.9956, log = FALSE)})(0:9)
```

```
##  [1] 0.3045447 1.5213833 3.8001113 6.3279454 7.9029710 7.8960163 6.5742232
##  [8] 4.6917414 2.9297579 1.6262109
```