

Задача 1

```
exp <- function() {  
  problems <- sample(c(rep(0, 80), rep(1, 20)), 100, replace = F)  
  variants <- matrix(problems, ncol = 20, byrow = T)  
  sums <- colSums(variants)  
  all(sums == 1)  
}  
  
res <- replicate(100000000, exp())  
sum(res)/length(res)
```

Задача 2

```
exD <- 183.8  
dxD <- 7.1  
exS <- 177.3  
dxS <- 6.4  
dutchProb <- 0.8  
spanishProb <- 0.2  
n <- 100  
  
probBsim <- function() {  
  exp <- function() {  
    dutchHeights <- rnorm(dutchProb * n, exD, dxD)  
    spanishHeights <- rnorm(spanishProb * n, exS, dxS)  
  
    heights <- c(dutchHeights, spanishHeights)
```

```
h <- sample(heights, 1)
h >= 180 & h <= 190
}
```

```
res <- replicate(100000, exp())
sum(res)/length(res)
}
probBsim()
```

```
probBfunc <- function() {
  dutchHeightsProb <- pnorm(190, exD, dxD) - pnorm(180, exD, dxD)
  spanishHeightsProb <- pnorm(190, exS, dxS) - pnorm(180, exS, dxS)
  prob <- dutchHeightsProb * dutchProb + spanishHeightsProb * spanishProb
  prob
}
probBfunc()
```

```
probCsim <- function() {
  exp <- function() {
    dutchHeights <- rnorm(dutchProb * n, exD, dxD)
    spanishHeights <- rnorm(spanishProb * n, exS, dxS)

    heights <- c(dutchHeights, spanishHeights)
    h <- sample(heights, 1)
    h > 190
  }
}
```

```
}
```

```
res <- replicate(100000, exp())
```

```
sum(res)/length(res)
```

```
}
```

```
probCsim()
```

```
probCfunc <- function() {
```

```
  dutchHeightsProb <- 1 - pnorm(190, exD, dxD)
```

```
  spanishHeightsProb <- 1 - pnorm(190, exS, dxS)
```

```
  prob <- dutchHeightsProb * dutchProb + spanishHeightsProb * spanishProb
```

```
  prob
```

```
}
```

```
probCfunc()
```