B case

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#Newsvendor Case

Samsung electronics will present galaxy S30 in 2021. The company expect demand follows U(4000,8000).the opening price is $1500. Then the company worry about that choosing factory for produce S30. In China factory, labor cost is $10 per unit and They're shipping the product by ship. One box has packing 100 unit and cost is $30 per one packing. If the stock was to remain in the box the shipping cost is $0.5 per unit.In Vietnam factory, labor cost is $6 per unit. And shipping cost is $45. Remain product shipping cost is $0.9 per unit. Material cost is $300 each of them. They sell the part of S30's leftover and the value is $150. Choose the efficiency factory to produce Galaxy S30.

#China Factory

```r
try_X <- seq(from = 4000, to = 8000, by = 1)
exp_profits <- NULL

for(X in try_X){
  set.seed(1234)
  D <- runif(n=10000, min= 4000, max=8000)
  sales_rev <- 1500*pmin(D,X)
  salvage_rev <- 150*pmax(X-D,0)
  material_cost <- 300*X
  labor_cost <- 10*X
  shipping_cost <- 30*(X%/%100)
  shipping_remain_cost <- 0.5*(X%%100)
  exp_profit <- mean(sales_rev + salvage_rev - material_cost - labor_cost - shipping_cost -shipping_rema
  exp_profits <- c(exp_profits, exp_profit)
}




result <- data.frame(try_X, exp_profits)
idx <- which(exp_profits==max(exp_profits))

print ('optimal stock')
```

```
## [1] "optimal stock"
```

```r
try_X[idx]
```

```
## [1] 7520
```

```r
print ('expected profits')
```

```
## [1] "expected profits"
```

```r
exp_profits[idx]
```

```
## [1] 6857761
```

#Vietnam Factory

```r
try_X <- seq(from = 4000, to = 8000, by = 1)
exp_profits <- NULL

for(X in try_X){
  set.seed(1234)
  D <- runif(n=10000, min= 4000, max=8000)
  sales_rev <- 1500*pmin(D,X)
  salvage_rev <- 150*pmax(X-D,0)
  material_cost <- 300*X
  labor_cost <- 6*X
  shipping_cost <- 45*(X%/%100)
  shipping_remain_cost <- 0.9*(X%%100)
  exp_profit <- mean(sales_rev + salvage_rev - material_cost - labor_cost - shipping_cost -shipping_rema
  exp_profits <- c(exp_profits, exp_profit)
}




result <- data.frame(try_X, exp_profits)
idx <- which(exp_profits==max(exp_profits))

print ('optimal stock')
```

```
## [1] "optimal stock"
```

```r
try_X[idx]
```

```
## [1] 7530
```

```r
print('expected profits')
```

```
## [1] "expected profits"
```

```r
exp_profits[idx]
```

```
## [1] 6886727
```

So, choosing Vietnam Factory is more efficiency