677 assignment1

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The significance level here is 0.05, depend on the normal distribution plot, the z statistics equals to 1.64.

$$z = \frac{\hat{p} - p_o}{\sqrt{\frac{p_o(1-p_o)}{n}}}$$

$$1.64 = \frac{\hat{p} - 0.6}{\sqrt{\frac{0.6(1-0.6)}{100}}}$$

```
1.64*sqrt(0.6*0.4)/10+0.6
```

```
## [1] 0.6803433
```

So that the minimum value of m should be 69.

The significance level here is 0.05, depend on the normal distribution plot, the z statistics equals to -1.64.

$$z = \frac{\hat{p} - p_o}{\sqrt{\frac{p_o(1-p_o)}{n}}}$$

$$-1.64 = \frac{\hat{p} - 0.6}{\sqrt{\frac{0.6(1-0.6)}{100}}}$$

```
-1.64*sqrt(0.8*0.2)/10+0.8
```

```
## [1] 0.7344
```

So the largest value of m should be 73.

```
alpha_0.6_m <- function(m){
  dbinom(m,100,0.6)
}

alpha_0.8_m <- function(m){
  dbinom(m,100,0.8)
}

for (i in 69:100) {

  m_1 <- 1
  if(alpha_0.6_m(m_1)<0.05){
    m_1 <- i + 1
    print(m_1)
```

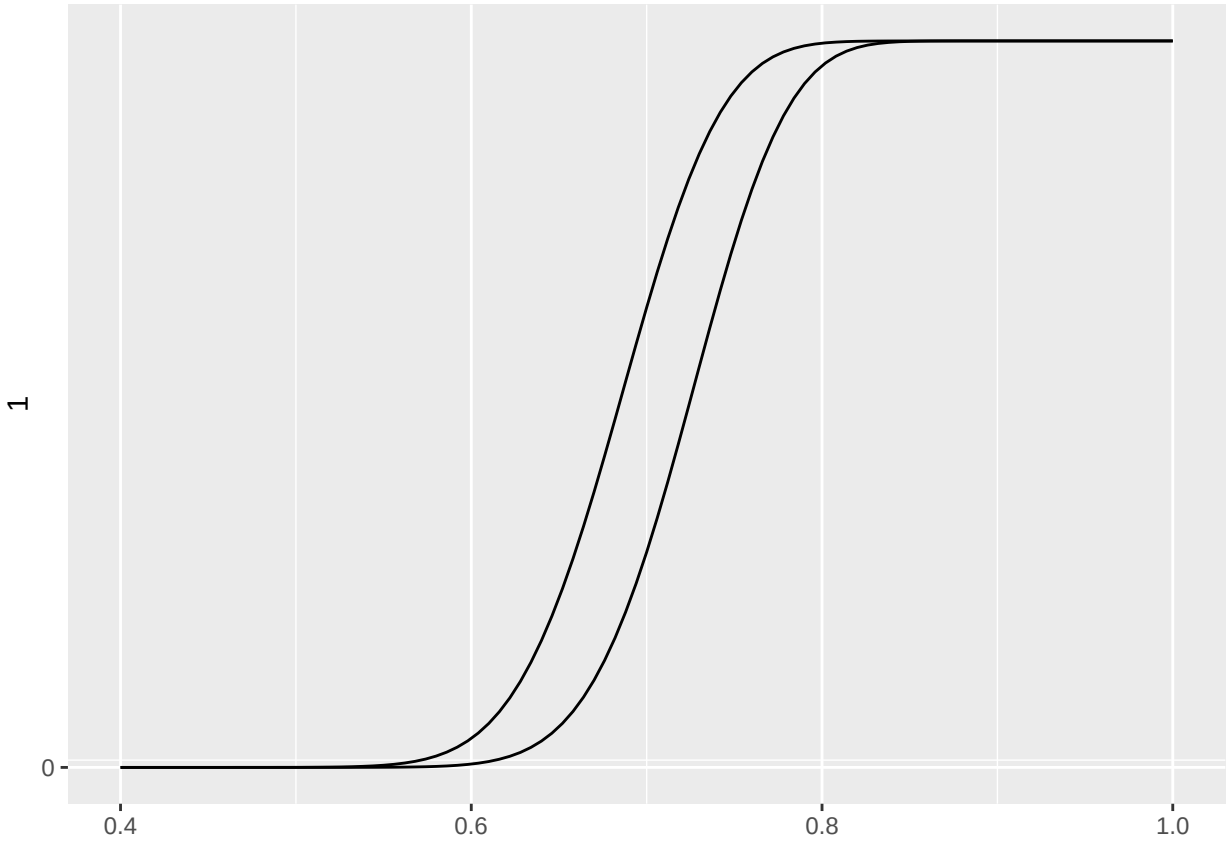
```
    break

}}
```

```
## [1] 70
```

```
for (j in 73:100) {

  m_2 <- 1
  if(alpha_0.8_m(m_2)<0.05){
    m_2 <- j + 1
    print(m_2)
    break

}}
```

```
## [1] 74
```

```
# plot
alpha_p_69 <- function(p){
 a <- sum(dbinom(69:100,100,p))
 a
}
alpha_p_73 <- function(p){
 b <- sum(dbinom(73:100,100,p))
 b
}

alpha_p_69 <- Vectorize(alpha_p_69)
alpha_p_73 <- Vectorize(alpha_p_73)

ggplot() +
  stat_function(fun = alpha_p_69) +
  stat_function(fun = alpha_p_73) +
  xlim(0.4, 1) +
  scale_y_continuous(breaks = 0,1,0.01)
```


1
0
0.4
0.6
0.8
1.0