Assign2TEMPLATE

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### 1. Z ~ N(0,1)

# A. P(Z ≤ 0.79)  
pnorm(0.79)

## [1] 0.7852361

# B. P(Z ≤ -0.23)   
pnorm(-0.23)

## [1] 0.4090459

# C. P(Z > 1.42)  
1- pnorm(1.42)

## [1] 0.07780384

# D. P(-0.23 ≤ Z ≤ 1.10)  
# same as = P(Z<= 1.1) - P(Z<= -0.23)  
pnorm(1.1) - pnorm(-0.23)

## [1] 0.4552881

# E. Find the value z such that P(Z ≤ z) = 0.2843  
qnorm(0.2843)

## [1] -0.5701146

# F. Find the value z such that P(Z > z) = 0.3264  
qnorm(1-0.3264)

## [1] 0.4498758

### 2. Y ~ N(5.2, 0.8)

{  
 mu <- 5.2  
 sigma <- 0.8  
}  
  
#A P(Y < 6)  
pnorm((6-mu)/sigma)

## [1] 0.8413447

#B P(Y > 5)   
1-pnorm(((5-mu)/sigma))

## [1] 0.5987063

#C P(4.8 < Y < 6.8)  
pnorm((6.8-mu)/sigma) - pnorm((4.8-mu)/sigma)

## [1] 0.6687123

#D y such that P(Y < y) = 0.85   
mu + (qnorm(0.85)\*sigma)

## [1] 6.029147

### 3. Property of Y ~ skewed distn (mu=80, sd=5). Random sample of n = 100 is drawn.

1. Give an interval with the property that at least 75% of the data will be in that interval.

**80 +/- 10, so (70, 90)**

What rule did you use to determine the interval? **I used the part of Chebyshev’s rule that says at least 75% of the data will lie within Y(bar) +/- 2s**

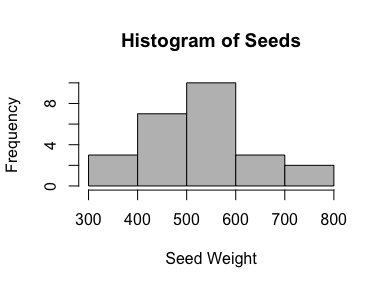
1. Describe the distribution of Y(bar) Give the mean, standard deviation and shape of the distribution. (3 pts) **As stated, the mean is 80, the standard deviation is 5, and the shape of the distribution is normal due to the Central Limit Theorem.**

### 4. Seeds: A random sample of n=25 seeds from a particular bean population is obtained. The weight of each seed is recorded.

seeds<-read.csv("~/Desktop/Seeds.csv")  
str(seeds)

## 'data.frame': 25 obs. of 1 variable:  
## $ Weight: int 343 659 348 433 755 441 469 583 431 562 ...

# A. Construct a histogram of the data. Also give the sample mean and sample standard deviation. (3 pts)  
hist(seeds$Weight,   
 col="grey",   
 main="Histogram of Seeds",   
 xlab="Seed Weight")



mean(seeds$Weight)

## [1] 526.12

sd(seeds$Weight)

## [1] 113.7279

# B. Give a 95% confidence interval for μ (population mean seed weight).  
t.test(seeds$Weight,   
 mu= mean(seeds$Weight),   
 conf.level = .95)

##   
## One Sample t-test  
##   
## data: seeds$Weight  
## t = 0, df = 24, p-value = 1  
## alternative hypothesis: true mean is not equal to 526.12  
## 95 percent confidence interval:  
## 479.1754 573.0646  
## sample estimates:  
## mean of x   
## 526.12

C. Interpret your confidence interval from part B. **There is a 95% chance that the mean value will fall between [479.1754, 573.0646]**

D. Do you think the CI is valid? In other words, are assumptions satisfied? **I think the CI is valiid. Even though the histogram looks slightly skewed to the left, the distribution given by the t-test is still generally right even if the data are not completely normal.**

#5 Describe how the following affect the width of the confidence interval (assuming everything else is held constant). Answer should be increase, decrease or stays the same.

A. Sample size increases. **CI width decreases**

B. Confidence level increases. **CI width increases**

C. Standard deviation increases. **CI width increases**