

# Lab 8

Kristina Arevalo

Wed Nov 04 2020

## Contents

Problem 1	2
Problem 2	2

## Problem 1

Write a function to convert a vector of raw-scores into z-scores. The function should have inputs for the vector, the mean and sd of the normal distribution, and should return a vector of zscores. (1 point). \*Also, demonstrate that the function works correctly (1 point). How you make the demonstration is up to you.

```
convert_to_z_score <- function(score,mean,sd){  
  z_scores <- (score-mean)/sd  
  return(z_scores)  
}
```

```
raw_scores<- c(85,76,91,65,88)  
convert_to_z_score(raw_scores, 75, 2)
```

```
## [1] 5.0 0.5 8.0 -5.0 6.5
```

```
confidence=100
```

## Problem 2

Base R does not have a function for a z-test. Write a function to accomplish a one-sample z-test. Remember, a one-sample z test is used to compare the probability of obtaining the sample mean (or larger or smaller) if it came from a known normal distribution. (2 points).

*Use your z-test function to conduct a test of the following. A sample of 25 scores is taken. The mean of the sample is 50. The sample is assumed to have been taken from a normal distribution with mean 40 and standard deviation 7. Report a one-tailed z-test, examining the probability of obtaining a sample of greater than 50 in this situation. Report the results, and give a brief sentence explaining the result and the inference you make (2 points).*

```
z_test <- function(sample_mean, sample_size, mu, sigma){  
  sample_dist_mean <- mu  
  sample_dist_sd <- sigma/(sqrt(sample_size))  
  
  p_value <- pnorm(sample_mean, sample_dist_mean, sample_dist_sd, lower.tail = FALSE)  
  return (p_value)  
}
```

```
z_test(sample_mean = 50,  
        sample_size = 25,  
        mu= 40,  
        sigma = 7)
```

```
## [1] 4.570531e-13
```

Given this information, the value of is p is very small or  $p < .001$  and it would be improbable to obtain a sample of greater than 50 with these values.

```
confidence= 50
```