problem set 1

October 3, 2022

[4]:
```
#Stats Problem Set 1
```

[ ]:
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[5]:
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##Question 1
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[6]:
```
##1. Find a 90% confidence interval for the average student IQ in the school.
```

[7]:
```
y <- c(105, 69, 86, 100, 82, 111, 104, 110, 87, 108, 87, 90, 94, 113, 112, 98,␣
↪80, 97, 95, 111, 114, 89, 95, 126, 98)
```

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```
## I used code from this site to get the confidence intervals https://bookdown.
↪org/logan_kelly/r_practice/p09.html
```

[8]:
```
mean(y) #1. get mean
```

98.44

[9]:
```
ymean <- mean(y)
```

[12]:
```
# To get the confidence interval I need the standard error and the length
ysd <- sd(y)
lensd <- length(y)
yse <- ysd/sqrt(lensd)
```

[11]:
```
yse # the standard error
```

2.61857467591309

[13]:
```
alpha = 0.1
df = lensd - 1
t.score = qt(p=alpha/2, df=df,lower.tail=F)
t.score # found the t-score
```

1.71088207990943

[20]:
```
lower <- ymean - 0.9
upper <- ymean + 0.9
print(c(lower,upper)) # 90% confidence interval
```

```
[1] 97.54 99.34
```

[15]:
```
#2. Next, the school counselor was curious whether the average student IQ in␣
↪her school
#is higher than the average IQ score (100) among all the schools in the country.
#Using the same sample, conduct the appropriate hypothesis test with   = 0.05.
```

[16]:
```
mean(y) #1. get mean
ymean <- mean(y)
```

98.44

[17]:
```
ysd <- sd(y)
lensd <- length(y)
yse <- ysd/sqrt(lensd)
yse # the standard error
```

2.61857467591309

[18]:
```
alpha2 = 0.05
df = lensd - 1
t.score2 = qt(p=alpha2/2, df=df,lower.tail=F)
t.score2 # found the t-score
```

2.06389856162803

[21]:
```
lower2 <- ymean - 0.95
upper2 <- ymean + 0.95
print(c(lower2,upper2))
```

```
[1] 97.49 99.39
```

[ ]: