QSCI 482 Story 1

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Question 1

1. Using elementary expressions in R, calculate the density for a standard normal when X i = 0

```
X = 0
Y = (1/sqrt(2*pi)) * exp( -(X**2 / 2 ))
print(Y)
```

```
## [1] 0.3989423
```

2. Using elementary expressions in R, calculate the density for a standard normal when X i = 2 .

```
X = 2
Y = (1/sqrt(2*pi)) * exp( -(X**2 / 2 ))
print(Y)
```

```
## [1] 0.05399097
```

3. Show the R code demonstrating how you can check your answers using dnorm().

```
X = 2
mu = 0
sd = 1
dnorm(X, mu, sd)
```

```
## [1] 0.05399097
```

Question 2

1. Load the data in "SturgeonData.csv" into R and save it in a variable. Answer all questions in units of millimeters (mm).

```
rm(list = ls())
df <- read.csv('SturgeonData.csv')
```

2. What is the mean length of sturgeon?

```
sturg_mean_len = mean(df$Length)
print(sturg_mean_len)
```

```
## [1] 1359.921
```

3. What is the median length of sturgeon?

```
sturg_median_len = median(df$Length)
print(sturg_median_len)
```

```
## [1] 1368
```

4. What is the variance of sturgeon lengths?

```
sturg_var = var(df$Length)
print(sturg_var)
```

```
## [1] 46177.12
```

5. What is the standard deviation of sturgeon lengths?

```
sturg_std = sd(df$Length)
print(sturg_std)
```

```
## [1] 214.8886
```

6. What is the coefficient of variation of sturgeon lengths?

```
sturg_cv = sturg_std / sturg_mean_len
print(sturg_cv)
```

```
## [1] 0.1580155
```

7. What is the Z-value for a sturgeon of length 2000 mm?

For parts 8-10, assume that sturgeon lengths follow a normal distribution with the parameters just calculated. 8. What proportion will be shorter than 1000 mm? 9. What proportion will be longer than 1500 mm? 10. What proportion will fall inside the slot limit of 44-50 inches (you'll need to convert to mm)?