```r
# Intro to R Assignment
# DSC 520
# Week 1
# Statistics for Data Science Assignment Week 1
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# Assignment Start

# Create function to print the Task 4 scenario and questions along with the
# desired answers to those questions.

task_4 <- function() {

  print("Task 4: Say I own 857 CDs. My friend has written a computer program")
  print("that uses a webcam to scan the shelves in my house where I keep my CDs")
  print("and measure how many I have. His program says that I have 863 CDs.")
  print("Define measurement error. What is the measurement error in my friend's CD-counting device?")

  print("Measurement error is the discrepancy between what is known to be true")
  print("concerning the value of an entity being measured and the true value of")
  print("that entity actually being measured in real time.")
}

# Create function to display the shape of a normal distribution
# This function will use the dnorm() built-in function for distributions
# seq() built-in function will define the parameters of the distributions
# plot() built-in function will be used to sketch the shape of the distributions

task_5_norm_dist <- function() {

  # length.out is a keyword that sets the total number of values present

  x <- seq(-3, 3, length.out = 100)

  # standardized values for mean and standard deviation to create the plot

  y <- dnorm(x, mean = 0, sd = 1)

  # Create a plot of the normal distribution using x and y as parameters
  # type is included as a parameter so R knows to draw a line or "l"

  plot(x, y, type = "l")
}

# Create function to display the shape of a positively skewed distribution
# This function will use the rgamma() built-in function for skewed distributions
# The parameters of the positively skewed distribution plot will be stored in a variable
# plot() built-in function will be used to sketch the shape of the distribution

task_5_pos_dist <- function() {

  # Since this function will use rgamma() which generates random values, setting
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  # the seed needs to be done to have the same random values generate each time
  # the code is run
  # 123 is the standard value entered, but any number can be entered

  set.seed(123)

  # pos_skewed_values variable is created to capture the random values created
  # by the rgamma() function
  # rgamma() has two built-in parameters: shape and rate (values are set to 1
  # each to plot high positive skewness)

  pos_skewed_values <- rgamma(100, shape = 1, rate = 1)

  # plot the positively skewed random distribution using the density()
  # built-in function and plot()

  plot(density(pos_skewed_values))
}

# Create function to display the shape of a negatively skewed distribution
# This function will also use the rgamma() function for skewed distributions
# The parameters of the negatively skewed distribution plot will be stored in a variable
# plot() and density() functions will be used to sketch the shape of the distribution

task_5_neg_dist <- function() {

  # Since this function will use rbeta() which generates random values, setting
  # the seed needs to be done to have the same random values generate each time
  # the code is run
  # 123 is the standard value entered, but any number can be entered

  set.seed(123)

  # neg_skewed_values variable is created to capture the random values created
  # by the rbeta() function
  # rbeta() has two built-in parameters: shape1 and shape2 (shape1 is set to 2
  # and shape2 is set to 0.5 to illustrate high negative skewness)

  neg_skewed_values <- rbeta(100, shape1 = 2, shape2 = 0.5)

  # plot the negatively skewed random distribution using density() and plot()

  plot(density(neg_skewed_values))
}

# Create function to print the Task 5 instructions and answers

task_5 <- function() {

  print("Task 5: Sketch the shape of a normal distribution, a positively skewed")
  print("distribution and a negatively skewed distribution.")
  task_5_norm_dist()
  task_5_pos_dist()
```

```
  task_5_neg_dist()
}

task_4()
```

```
## [1] "Task 4: Say I own 857 CDs. My friend has written a computer program"
## [1] "that uses a webcam to scan the shelves in my house where I keep my CDs"
## [1] "and measure how many I have. His program says that I have 863 CDs."
## [1] "Define measurement error. What is the measurement error in my friend's CD-counting device?"
## [1] "Measurement error is the discrepancy between what is known to be true"
## [1] "concerning the value of an entity being measured and the true value of"
## [1] "that entity actually being measured in real time."
```

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task_5()
```

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## [1] "Task 5: Sketch the shape of a normal distribution, a positively skewed"
## [1] "distribution and a negatively skewed distribution."
```
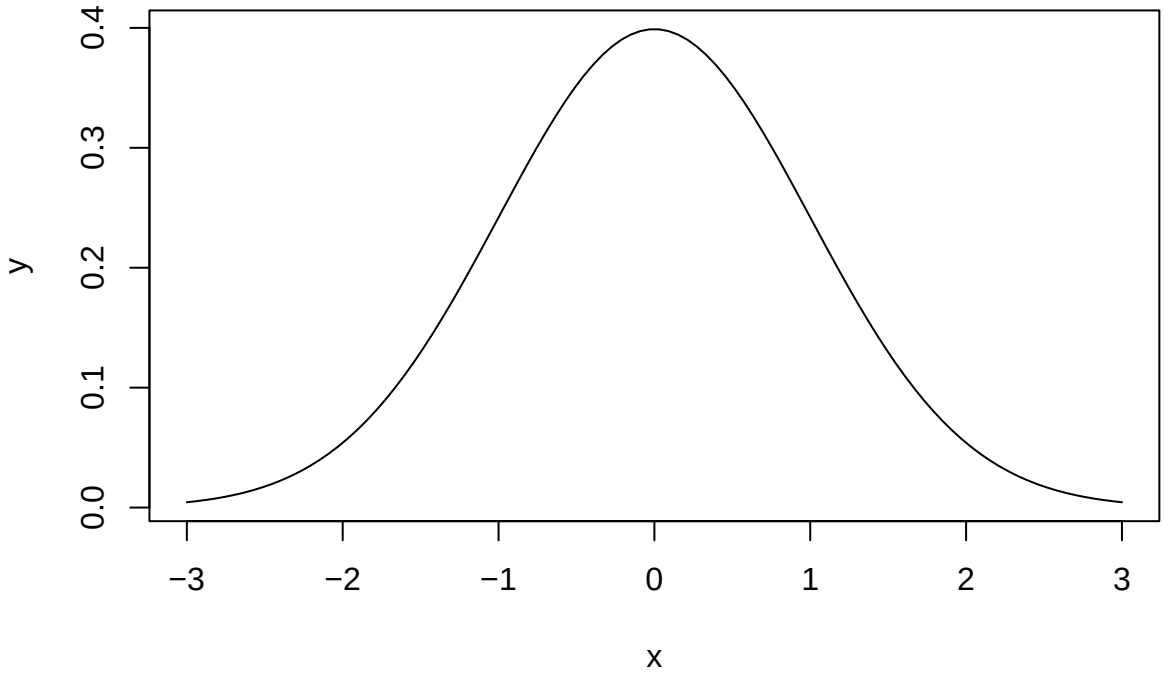
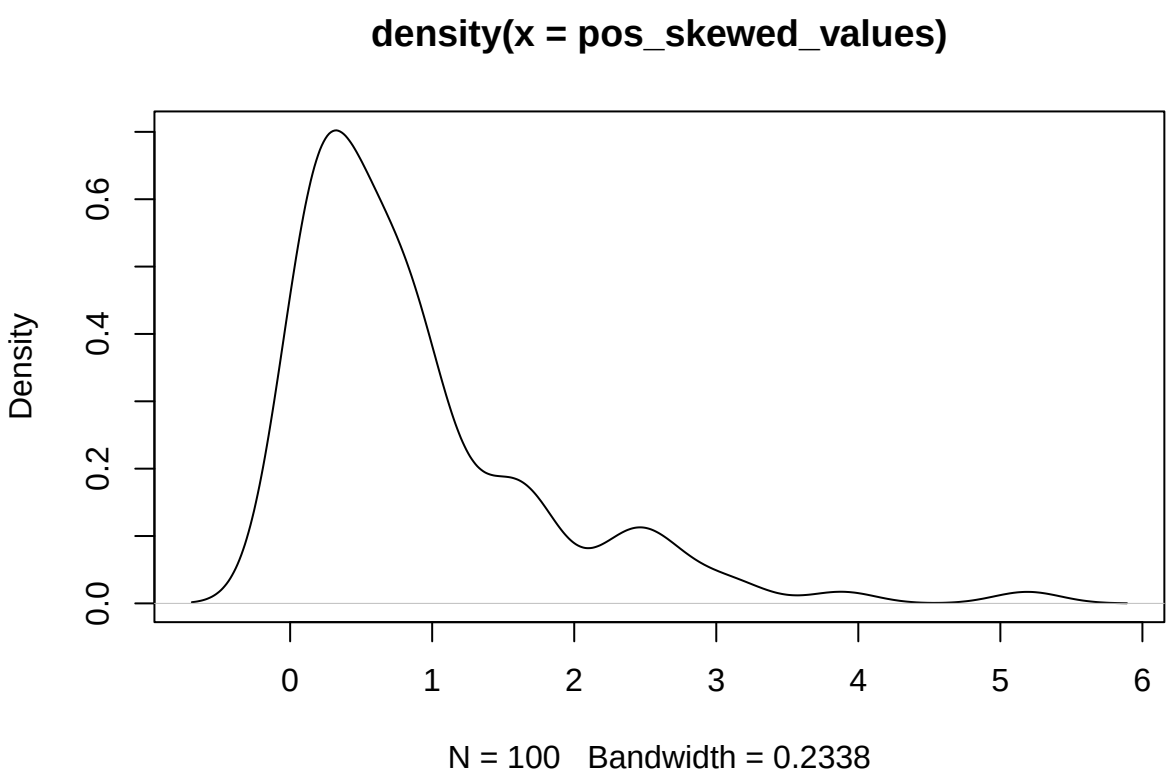
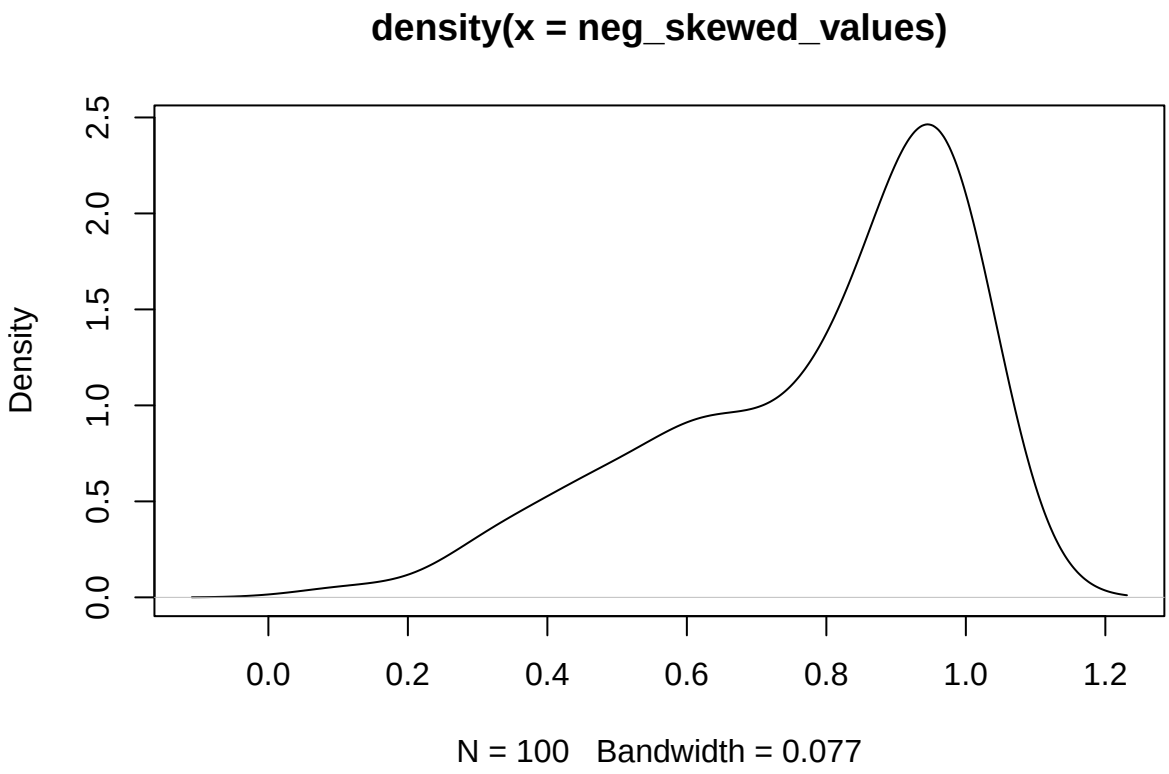




density(x = pos_skewed_values)
Density
0.0
0.2
0.4
0.6
0
1
2
3
4
5
6
N = 100 Bandwidth = 0.2338


density(x = neg_skewed_values)
Density
0.0
0.5
1.0
1.5
2.0
2.5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
N = 100 Bandwidth = 0.077