Class Activity 3

Your name here

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Data objects can range from simple vectors, which are one-dimensional arrays that hold elements of the same type, to more complex structures like lists and data frames that can store heterogeneous data types. R treats everything as an object, from simple numbers and strings to more complex data structures. This concept allows for a high degree of flexibility in data manipulation and analysis. Here are some of the fundamental data objects you'll encounter in R:

- Vectors: The simplest and most common type of data object in R. They hold elements of the same data type.

- Matrices: Two-dimensional, rectangular data structures that can store data of a single type.

- Data frames: Similar to matrices but can contain different types of data in each column, much like a spreadsheet.

- Lists: Complex data structures that can hold elements of any type, including other lists.

Understanding these data objects and their characteristics is the first step towards mastering data analysis in R. Now, let's explore some examples of these data objects in action.

```
# some interesting data objects
x <- floor(seq(2,2e2,length.out = 5))
x.mat <- cbind(x, x**2)
x.df <- data.frame(x=x,x.square=x**2)
my.list <- list(myVec=x, myDf=x.df, myString=c("data science","machine learning"))
```

Question 1: data types

- What data type is `x`?

Answer:

```
# code
```

- What data type is `c(x, x/2)`?

Answer:

```
# code
```

- What data type is `c(x,NA)`? What data type is `c(x,"NA")`?

Answer:

```
# code
```

Question 2: Subsetting and coercion

- How can we reverse the order of entries in `x`?

Answer:

```
# code
```

- What does `which(x < 100)` equal?

Answer:

```
# code
```

- Extract the element of x that corresponds to the location in the preceding question.

Answer:

```
# code
```

- What does `sum(c(TRUE,FALSE,TRUE,FALSE, TRUE))` equal?

Answer:

```
# code
```

- What does `sum(x[c(TRUE,FALSE,TRUE,FALSE, TRUE)])` equal?

Answer:

```
# code
```

- What does `sum(x < 100)` equal?

Answer:

```
# code
```

- What does `sum(x[x < 100])` equal?

Answer:

```
# code
```

- Why `dim(x.mat[1:2,1])` return `NULL` while `dim(x.mat[1:2,1:2])` returns a dimension?

Answer:

```
# code
```

Question 3: Lists

- Using `my.list`, show six ways to write one command that gives the 3rd entry of variable `x` in data frame `myDf`

Answer:

```
# code
```

- What class of object does the command `my.list[3]` return?

Answer:

```
# code
```

- What class of object does the command `my.list[[3]]` return?

Answer:

```
# code
```

- What class of object does the command `unlist(my.list)` return? Why are all the entries `character`s?

Answer:

```
# code
```