Assignment 2: Coding Basics

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OVERVIEW

This exercise accompanies the lessons in Environmental Data Analytics on coding basics.

Directions

1. Rename this file `<FirstLast>_A02_CodingBasics.Rmd` (replacing `<FirstLast>` with your first and last name).
2. Change "Student Name" on line 3 (above) with your name.
3. Work through the steps, **creating code and output** that fulfill each instruction.
4. Be sure to **answer the questions** in this assignment document.
5. When you have completed the assignment, **Knit** the text and code into a single PDF file.
6. After Knitting, submit the completed exercise (PDF file) to Sakai.

Basics Day 1

1. Generate a sequence of numbers from one to 100, increasing by fours. Assign this sequence a name.
2. Compute the mean and median of this sequence.
3. Ask R to determine whether the mean is greater than the median.
4. Insert comments in your code to describe what you are doing.

```
#1. generating sequence
seq(1,100)
```

```
##   [1]   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18
##  [19]  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36
##  [37]  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53  54
##  [55]  55  56  57  58  59  60  61  62  63  64  65  66  67  68  69  70  71  72
##  [73]  73  74  75  76  77  78  79  80  81  82  83  84  85  86  87  88  89  90
##  [91]  91  92  93  94  95  96  97  98  99 100
```

```
#2. mean and median of the sequence and renaming the sequence
#setting a2 = 100
a2 <- seq(1,100)

#mean
mean(a2)
```

```
## [1] 50.5
```

```r
mean_a2 <- mean(a2)
mean_a2
```

```
## [1] 50.5
```

```r
#median
median(a2)
```

```
## [1] 50.5
```

```r
median_a2 <- median(a2)
median_a2
```

```
## [1] 50.5
```

```r
#3.comparison
mean_a2 > median_a2
```

```
## [1] FALSE
```

```r
#mean and median are equal
```

Basics Day 2

5. Create a series of vectors, each with four components, consisting of (a) names of students, (b) test scores out of a total 100 points, and (c) whether or not they have passed the test (TRUE or FALSE) with a passing grade of 50.
6. Label each vector with a comment on what type of vector it is.
7. Combine each of the vectors into a data frame. Assign the data frame an informative name.
8. Label the columns of your data frame with informative titles.

```r
#5
#name of students
student_names <- c("Dwiti, Ria, Aditi, Sanjana")
student_names #character
```

```
## [1] "Dwiti, Ria, Aditi, Sanjana"
```

```r
#test scores
test_scores <- c(80, 85, 90, 49)
test_scores #numeric
```

```
## [1] 80 85 90 49
```

```r
#pass/fail condition
fail <- ifelse(test_scores<50, TRUE, FALSE)
fail #logical
```

```
## [1] FALSE FALSE FALSE  TRUE
```

```r
#6
class(student_names)
```

```
## [1] "character"
```

```r
class(test_scores)
```

```
## [1] "numeric"
```

```r
class(fail)
```

```
## [1] "logical"
```

```r
#7
df_studentdata <- data.frame(student_names,test_scores,fail)
df_studentdata
```

```
##                student_names test_scores  fail
## 1 Dwiti, Ria, Aditi, Sanjana          80 FALSE
## 2 Dwiti, Ria, Aditi, Sanjana          85 FALSE
## 3 Dwiti, Ria, Aditi, Sanjana          90 FALSE
## 4 Dwiti, Ria, Aditi, Sanjana          49  TRUE
```

```r
names(df_studentdata) <- c('Name', 'Score', 'Fail')
df_studentdata
```

```
##                         Name Score  Fail
## 1 Dwiti, Ria, Aditi, Sanjana    80 FALSE
## 2 Dwiti, Ria, Aditi, Sanjana    85 FALSE
## 3 Dwiti, Ria, Aditi, Sanjana    90 FALSE
## 4 Dwiti, Ria, Aditi, Sanjana    49  TRUE
```

9. QUESTION: How is this data frame different from a matrix?

   Answer: Where matrix contain only a single type of data, data frames can contain various types of data.

10. Create a function with an if/else statement. Your function should take a **vector** of test scores and print (not return) whether a given test score is a passing grade of 50 or above (TRUE or FALSE). You will need to choose either the `if` and `else` statements or the `ifelse` statement.

```
#10
```

11. Apply your function to the vector with test scores that you created in number 5.
12. QUESTION: Which option of `if` and `else` vs. `ifelse` worked? Why?

    Answer: