Exam 1 Template

YOUR NAME HERE

DATA 2401 - Fall 2022

"We will be honest in all our academic activities and will not tolerate dishonesty."

– UHD Academic Honor Code

You are submitting this exam under the UHD honor code. Answer all below questions. Complete the questions, knit the file to html, commit and push to your repository *BEFORE 2:45* and turn in link to the repository to Blackboard. **Any commit made after 2:45 pm will not be graded.**

Part 1 (20 points)

- You will get 10 points of credit for a properly knit RMD/html(or pdf) file.
- You will get 10 points of credit for a properly committed and pushed GitHub repository, with clear and descriptive commit descriptions.

Part 2 (10 points)

In your own words, *briefly* describe the difference between saving, committing, and pushing.

Part 3 (10 points)

- [2 points] Create a vector named `numbers` that contains the odd numbers from 3 to 15.

- [3 points] Create a second vector called `half_numbers` that contains the elements of `numbers` divided by 2

- [2 points] Add the string "puppies" to the end of `numbers`.

- [3 points] Try to divide the new vector by two. Does it work? Why or why not?

Part 4 (15 points)

You run a small dog daycare. This is the data you have on the dogs that come to your business.

```
names <- c("Fido", "Doug", "Bella", "Max", "Cooper", "Lucy", "Duke", "Barkley")
age <- c(2, 5, 4, 6, 1, 13, 9, 3)
weight <- c(14, 89, 32, 46, 55, 7, 25, 36)
```

- [2 points] Find the average weight and age of the dogs.
- [2 points] How light is the dog with the lowest weight?
- [3 points] What is the name of the oldest dog?
- [3 points] What is the age of the heaviest dog?
- [2 points] It's been 2 years since you entered this information! Change `age` to reflect that.
- [3 points] A new dog is here! Her name is Daisy, she is 3 years old, and weighs 39 pounds. Add her to your data.

Part 5 (10 points)

In baseball, the slugging percentage is computed with 5 variables, the number of singles, doubles, triples, homeruns and at-bats. We abbreviate these 1B, 2B, 3B, HR and AB.

1. [7 points] Write a function that takes these 5 values as arguments and returns the slugging percentage for that player.

$$\frac{(1B + 2B \times 2 + 3B \times 3 + HR \times 4)}{AB}$$

2. [3 points] The Astros player Jose Altuve currently has the following stats:

```
1B = 89, 2B = 34, 3B = 0, HR = 25, AB = 499
```

Use your function to find his slugging percentage.

Part 6 (15 points)

1. [6 points] Write a function that takes a vector `x` and returns a vector with the square root of each element of the vector.

For example, if you pass the function a vector containing 4 and 16, it should return a vector containing 2 and 4.

2. [6 points] Write a second function that does the above, but also removes any negative values or changes them to 0.

   For example, if you pass *this* function -4 and 16, it should return either 0 and 4 or just 4.

3. [3 points] Test your second function on the following vectors:

```
test1 <- c(1:10)
test2 <- c(-4:4)
```

Part 7 (10+3 points)

A fancy tech company gives employees ratings of 1, 2 and 3, which are used to compute their annual bonuses. If an employee gets a score of 3, their bonus is 15% of their salary, if they get a 2, their bonus is 10% of their salary, if they get a 1, their bonus is 5% of their salary.

Rating	Bonus Percent
3	15%
2	10%
1	5%

1. [8 points] Write a function that takes the employees score and their salary as arguments and returns their bonus amount for the year.

2. [2 points] Fitz makes $100,000 a year, but only got a score of 1. Use your function to calculate his bonus.

3. [3 extra credit points] Modify your function so that it returns the full pay for the year, salary and bonus combined. How much will Fitz make in total?