Skill Check 3: Building Better Code

Exam Agreement

This Skill Check is an individual assessment and you should not receive or offer help on it from any other human. Cell phones are to be handed in to the instructor and all other digital devices must be stored in bags underneath the bench of in the lab cubbies.

You may use any **physical** resource to complete the work. This includes:

- Any notes, code, slides, papers, or previous feedback from the instructor as long as they are on paper.
- Any books that you have with you.
- Any scholarly works such as papers that you have with you.

You may NOT use:

- Help from any other student or person. **This is an individual assessment.**
- Any digital resource that does not exist as a physical copy present in class.
- The use of generative artificial intelligence (e.g., ChatGPT).
- Help from homework websites such as Course Hero or Chegg.

By signing, you agree that you have neither given nor received unauthorized aid on this examination.

Printed Name: _____

Chapman ID: _____

Signed: _____

Date: _____

Include this signed page as the first page of your submitted work.

Skill Check Instructions

You must answer every question on the exam to the best of your ability. Include all appropriate code, syntax, and functions that would lead to the code to run successfully.
For each two questions correct, you will receive one course point for a total of two course points.

Question 1: Functions

Create a function that will calculate a number raised to its own power (i.e., 2^2, 3^3, 4^4, etc.). Include an example function call to demonstrate the function in operation.

Question 2: Loops

Write a **for loop** that prints out one color at each iteration from a set of six colors from the viridis color palette (using `viridis()`).

Question 3: Conditionals

Generate 100 random numbers using `sample()` and store as an object. Use a conditional to create a new object that categorizes each number as "even" or "odd" based on the values of the number in your first object. Hint: the %% operator in place of `/` will give you the remainder after division.

Question 4: Combinations

The following code creates an object `obj` that classifies each element of the numeric object `num` as "above one", "below one", or "unknown" based on the value of each member using nested `ifelse()` functions:

```
obj <- ifelse(num > 1, "above one",
              ifelse(num < 1, "below one", "unknown"))
```

Rewrite this code using regular if / else conditionals in a loop to achieve exactly the same results in `obj`.