

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 or 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

Write a function that performs the calculation: $z = 5x^4 + 6xy + xy^3 + y^4 + 2$. Include an example function call to demonstrate the function in operation.

Question 2: Loops

Write a **for loop** that prints out the data class for every member of **anoletree**.

▼ anoletree	List of 6	🔍
\$ edge	: num [1:162, 1:2] 83 84 85 86 87 88 89 90 ...	
\$ Nnode	: int 81	
\$ tip.label	: Named chr [1:82] "ahli" "allogus" "rubrib...	
..- attr(*, "names")=	chr [1:82] "1" "6" "70" "43" ...	
\$ edge.length:	num [1:162] 0.268 0.209 0.402 0.826 0.768...	
\$ maps	:List of 162	
..\$:	Named num 0.268	
.. ..- attr(*, "names")=	chr "TG"	
\$. Named num 0.209		

Question 3: Conditionals

Write out a conditional that categorizes the numeric object `num_1` of length 1 as “above one”, “below one”, or “unknown” based on its value.

Question 4: Combinations

Use any combination of loops, functions, conditionals, and/or apply to refactor the following code to remove repetition:

```
data("UCBAdmissions")
gender_applied <- data.frame("Male" = rep(NA, 6), "Female" = rep(NA, 6))
gender_applied$Male[1] <- sum(UCBAdmissions[,1][,"Male"])
gender_applied$Female[1] <- sum(UCBAdmissions[,1][,"Female"])
gender_applied$Male[2] <- sum(UCBAdmissions[,2][,"Male"])
gender_applied$Female[2] <- sum(UCBAdmissions[,2][,"Female"])
gender_applied$Male[3] <- sum(UCBAdmissions[,3][,"Male"])
gender_applied$Female[3] <- sum(UCBAdmissions[,3][,"Female"])
gender_applied$Male[4] <- sum(UCBAdmissions[,4][,"Male"])
gender_applied$Female[4] <- sum(UCBAdmissions[,4][,"Female"])
gender_applied$Male[5] <- sum(UCBAdmissions[,5][,"Male"])
gender_applied$Female[5] <- sum(UCBAdmissions[,5][,"Female"])
gender_applied$Male[6] <- sum(UCBAdmissions[,6][,"Male"])
gender_applied$Female[6] <- sum(UCBAdmissions[,6][,"Female"])
```