

- 1) Explain why the outputs of the two lines are different
  - a) Adding "" to the line makes it a character input, rather than a numeric value. R cannot do calculations (create a vector) with character inputs, and so it just returns what was typed.
- 2) Is c\_1 a variable, or a function?
  - a) Variable
- 3) Is c\_2 a variable, or a function?
  - a) Variable
- 4) If c\_1 and c\_2 have different values, why?
  - a) They have different values because c\_1 is a numeric input and c\_2 is a character input
- 5) What are the dimensions of the matrix (i.e. how many rows and columns)?
  - a) 1 column by 3 rows
- 6) Write R code to retrieve the element of mat\_1 that has a value of 3.
  - a) mat\_1 == 3
- 7) Paste the code you used to create mat\_2.
  - a) mat\_2 = matrix(my\_vec, nrow = 2, ncol = 3, byrow = TRUE)
- 8) Paste the code you used to create mat\_3.
  - a) mat\_3 = matrix(my\_vec, nrow = 3, ncol = 2, byrow = TRUE)
- 9) Did R use rows or columns to recycle the values in my\_vec?
  - a) Rows because I specified in the matrix function
- 10) Create a matrix, mat\_4, with a number of elements that is not a multiple of 3 and paste the code into the editor.
  - a) mat\_4 = matrix(my\_vec, nrow = 4, ncol = 2, byrow = TRUE)
- 11) How did R handle the recycling of values of my\_vec in mat\_4?
  - a) It gave a warning that the number of elements was not a multiple of three, and then just filled as much as it could (ended with a 2 instead of a 3)
- 12) For each of the 8 lines, answer the following:
  - a) Value, [[]], it chose the first element in the list
  - b) Value, [[]], it chose the first element in the list because as.numeric converts "1" to a numeric value
  - c) NULL, [[]], it looked for a component with the name "1"
  - d) Value, [[]], it chose the list item with the name "one"
  - e) Value, \$, it chose the list item with the name "one"
  - f) Value, \$, it chose the list item with the name "one". Same as the last one, despite the difference in quotations, because it is referring to a character value
  - g) Error
  - h) NULL, \$, it looked for an item with the name "1"
- 13) Identify which lines produced output "five point two" and explain why.
  - a) 4, 5, and 6. they all choose the list item with the name "one", which is item #2, "five point two"
- 14) Identify which lines produced NULL output and explain why.
  - a) 3 and 8. both ask R to print the list item with the name "1", but none of the list items had the name "1".