Example Exercises

This set of questions is not a substantial question bank. Rather, we hope that it provides you with some ideas for designing your own questions that reinforce the material covered in the videos.

Assignment and Naming

1. A variable is a ____ associated with a memory location that can hold data.

   A. characteristic
   B. name
   C. value
   D. string

2. A variable is ____ associated with a memory location that can hold data.

   A. a quantity
   B. an expression
   C. an object
   D. a name

3. Given the following symbol table

   ```
   ----------------------------
   Name        |   Value
   ----------------------------
   apple       |   5
   ----------------------------
   banana      |   3
   ----------------------------
   kiwi        |   6
   ----------------------------
   pear        |  ?
   ----------------------------
   ```

   a. If pear = apple + banana, what is pear's value?

      A. ‘5+3’
      B. 5
      C. 8

D. 53

b. After executing the following code, what is pear's value?

```
apple = apple + 1
pear = kiwi - apple
```

A. ‘6-5+1’
B. 0
C. 6
D. 2

4. Which one of the following Python assignments is invalid?

A. apple = 1
B. Apple = 2
C. red apple = 3
D. orange4 = 12

5. Please select ALL the invalid Python assignments.

A. 5orange = 10
B. _peach = apple
C. white_peach = 5
D. yellow-peach = 6

6. What value does the last statement print when the following R code is executed?

```
banana ← 2
pineapple ← 4
smoothie ← banana + pineapple

banana ← 1
apple ← 3
smoothie ← banana + apple

smoothie ← smoothie * 2
print(smoothie)
```

A. 4
B. 6
C. 8
D 12
E 12 8

7. Which of the following Python expressions would generate an int number?
   A. 1.0 + 2
   B. 4 + 5
   C. 2.0 + 5.0
   D. 1 + 2.5

8. Which of the following Python expressions would generate an error message?
   A. ‘apple ’ + ‘ pear’
   B. ‘banana ’ + 2
   C. ‘orange’ * 3
   D. ‘kiwi ’ + ‘2’

Memory Management

1. Given a list [‘a’, ‘p’, ‘p’, ‘l’, ‘e’]
   a. What is the element at index 1, if the list is a R list?
      A. ‘a’
      B. ‘p’
      C. ‘l’
      D. ‘e’

   b. What is the index number of the last element, if the list is a Python list?
      A. 5
      B. 4
      C. 3
      D. 6

2. An empty spreadsheet "menu.csv" has three columns: smoothie, calorie, and price. After executing the following code, answer the questions.

   filename ← "menu.csv"
   menu_data ← read_spreadsheet(filename)

   a. What is the value associated with the name "filename" in the symbol table?

      A. the spreadsheet name "menu.csv"
      B. the data frame representing the content of the spreadsheet "menu.csv"
      C. the column names in the spreadsheet "menu.csv"
      D. the reference to the data frame representing the content of the spreadsheet "menu.csv"

   b. What is the value associated with the name "menu_data" in the symbol table?

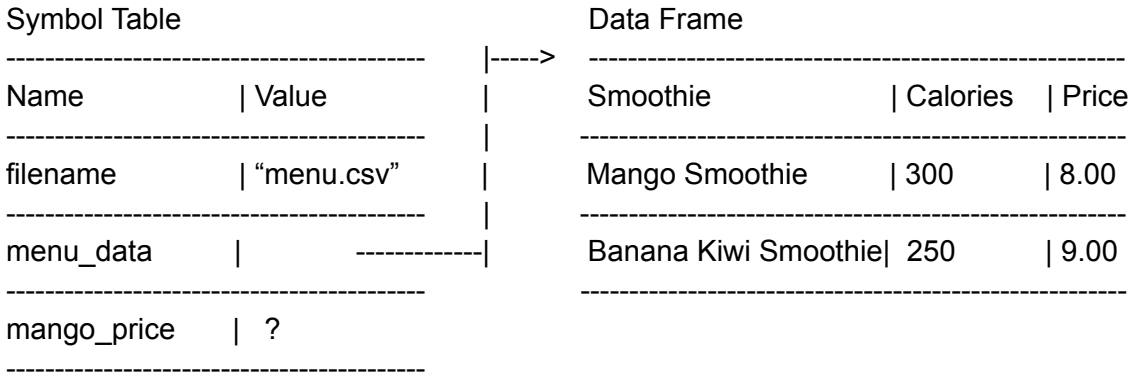
A. the spreadsheet name "menu.csv"
B. the data frame representing the content of the spreadsheet "menu.csv"
C. the column names in the spreadsheet "menu.csv"
D. the reference to the data frame representing the content of the spreadsheet "menu.csv"

c. Assume that after reading the spreadsheet into the menu_data data frame, some additional code adds several values to each column of menu_data. Will the new values automatically be stored in the spreadsheet file “menu.csv” on the hard disk?

A. Yes
B. No

3. After executing the first two lines of code below, the symbol table would look like the following

```
filename ← “menu.csv”
menu_data ← read_spreadsheet(filename)
set_cell(menu_data, 1, 3, 10.00)
mango_price ← get_cell(menu_data, 1, 3)
```



Documentation for set_cell and get_cell functions.

get_cell (dataframe, column_name, row_number)
This function returns the value of one cell in the given data frame. The cell is specified by giving a column name and a row number. For example, continuing with the previous example, get_cell(snack_data, “in stock”, 3) would return 20, i.e. the value that is in the 3rd row of the column with the name “in stock”, which represents the number of Milky Way that are in stock.

set_cell (dataframe, column_name, row_number, new_value)

This function modifies the given dataframe. Specifically, the given new value is inserted into the dataframe into the cell that is specified by the given column name and row number. The value that is currently in this cell will be replaced by the new value.
What is the value of mango_price in the symbol table?

A. 8.00
B. 10.00
C. 18.00
D. 9.00

Functions

1. Which statement about functions is false?
    A. Some functions have input values.
    B. All functions have return values.
    C. A function is a named block of instructions with a particular purpose.

2. Which of the following Python print statements would generate an error message?
    A. print(len([1, 2]))
    B. print("The sum is ", 1 + 2)
    C. print(1, 2, sep=",")
    D. print(sep=",", len([1, 2]))

3. What is the value the R code mean(seq(from=1, to=8, by=2)) would generate?
    A. 2
    B. 3
    C. 4
    D. 5
4. Select all the ways a function could be structured.
    A. No data in, no data returned
    B. Data in, no data returned
    C. No data in, data returned
    D. Data in, data returned

5. What is the value that gets printed when the following Python code is executed?

```
def double (val):
        new_val = val * 2
        return new_val

def main ():
        value = 5
        new_value = double(value)
        print(new_value)
```

main()

A. 5
B. 8
C. 10
D. 12

6. What is the output value you would receive after executing the following R code?

```
doubleprint ← function (value) {
        line ← paste("the value is", value)
        print(line)
        print(line)
}

doubleprint(5)
```

A. 5
B. the value is 5
C. the value is 5
   the value is 5
D. the value is, 5
   the value is, 5