



MathCodeLab – Lists

Part A: Multiple Choice (1 point each)

1. **What is an list used for in programming?**
 - A. To do math calculations
 - B. To store a single value
 - C. To store a collection of multiple items in one variable
 - D. To write comments in the code

2. **Given the list `colors = ["red", "green", "blue"]`, what code would you use to get the value "green"?**
 - A. `colors[0]`
 - B. `colors[1]`
 - C. `colors[2]`
 - D. `colors.get("green")`

3. **In programming, what is the index of the *first* element in an list?**
 - A. 1
 - B. -1
 - C. 0
 - D. It depends on the list size

4. **What does this code print?**

```
pets = ["cat", "dog", "fish"]  
pets[2] = "hamster"  
print(pets)
```

 - A. `["cat", "dog", "fish"]`
 - B. `["hamster", "dog", "fish"]`
 - C. `["cat", "dog", "hamster"]`
 - D. Error

5. **Which function is used to find the total number of items in an list called `my_list`?**
 - A. `count(my_list)`
 - B. `my_list.size()`
 - C. `len(my_list)`
 - D. `my_list.length`

6. **How do you add the item "apple" to the end of an list called `fruits`?**
 - A. `fruits.add("apple")`
 - B. `fruits.append("apple")`
 - C. `fruits.insert("apple")`
 - D. `fruits + "apple"`

7. **What does `my_list.pop()` do if `my_list` is `[10, 20, 30]`?** A. It removes 10 from the list.
B. It removes 20 from the list.
C. It removes 30 from the list.
D. It causes an error.
8. **What is the result of this code? `list1 = [1, 2]` `list2 = [3, 4]` `print(list1 + list2)`**
A. `[[1, 2], [3, 4]]`
B. `[1, 2, 3, 4]`
C. `[4, 6]`
D. Error

Part B: True or False (1 point each)

9. The items in an list can be of different types (e.g., numbers and strings).
10. Once you create an list, you cannot change the items inside it.
11. The index of the last item in `my_list = [10, 20, 30]` is 3.
12. A for loop can be used to go through every item in an list.
13. You can use negative numbers like -1 to get the last item in an list.
14. An list cannot be empty; it must contain at least one item.
15. The `list.remove("item")` method removes the first occurrence of "item".
16. An list can contain another list as one of its items.

Part C: Short Answer & Fix the Bug (2 points each)

17. In your own words, explain why lists are useful.

18. In the context of an list, what is an "index"?

19. **Fix the Bug:** The code below is supposed to print the first day of the week, "Monday", but it's causing an error. Find the error and write the corrected code.

Original buggy code

```
weekdays = ["Monday", "Tuesday", Wednesday]  
print(weekdays[3])
```

20. **Fix the Bug:** The code below has a syntax error that prevents it from running. Find the error and rewrite the line correctly.

Original buggy code

```
scores = [90, 85 77, 92]
```

21. **What is the output?** Read the code below and write down what it will print.

```
numbers = [5, 10, 15, 20]  
my_number = numbers[1] + numbers[2]  
print(my_number)
```

Part D: Code Challenges (3 points each)

22. **Create an list:** Write one line of code to create an list named hobbies that stores three of your favorite hobbies as strings.
23. **Access and print an element:** Using the hobbies list you created above, write a line of code to print the *last* hobby in the list.
24. **Change an element:** Write a line of code to change the *first* hobby in your hobbies list to "coding". Print the entire list to show it has changed.
25. **Add a new item:** Write a line of code to add a new hobby, "reading", to the *end* of your hobbies list.
26. **Find the length:** Write code to find and print the total number of hobbies in your hobbies list after adding the new one.
27. **Loop through an list:** Write a for loop that goes through your final hobbies list and prints each hobby on a new line.
28. **Remove an item:** Given the list foods = ["pizza", "sushi", "burger", "sushi"], write code to remove the first occurrence of "sushi". Print the final list.
29. **Nested List:** Create a 2x2 nested list (an list with two inner lists, each containing two numbers) called matrix. Then, print the number in the first row, second column.

Part E: Puzzles (3 points each)

30. **What is the final list?** Trace the code below and write down what the mix list looks like at the end.
- ```
mix = [1, "apple", 3]
mix[0] = "banana" mix[2]
= mix[0] print(mix)
```
31. **Predict the output:** What will the following code print to the screen? scores = [88, 92, 100, 95]
- ```
print(scores[-1])
```

32. **Fill in the blank:** Complete the code below so that it prints the number 40.

```
data = [10, 20, 30, 40, 50]  
print(data[_____])
```

33. **Predict the output:** What two lines will this code print?

```
items = ["a", "b", "c", "d"]  
removed_item = items.pop(1)  
print(removed_item)  
print(items)
```

34. **What does this print?**

```
grid = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]  
print(grid[1][2])
```