WORKING WITH A LOT OF DATA

MULTIPLE ENTRIES

Suppose a teacher has 25 students and wants to enter their names in a program to calculate their marks in percentage.

How many variables would she require to enter the names of 25 different students?

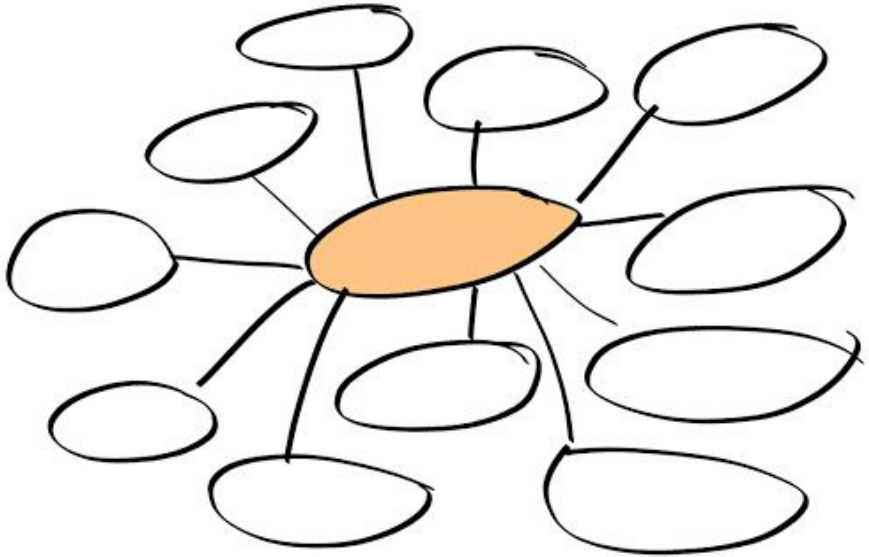
MULTIPLE ENTRIES

Suppose a teacher has 25 students and wants to enter their names in a program to calculate their marks in percentage.

How many variables would she require to enter the names of 25 different students?

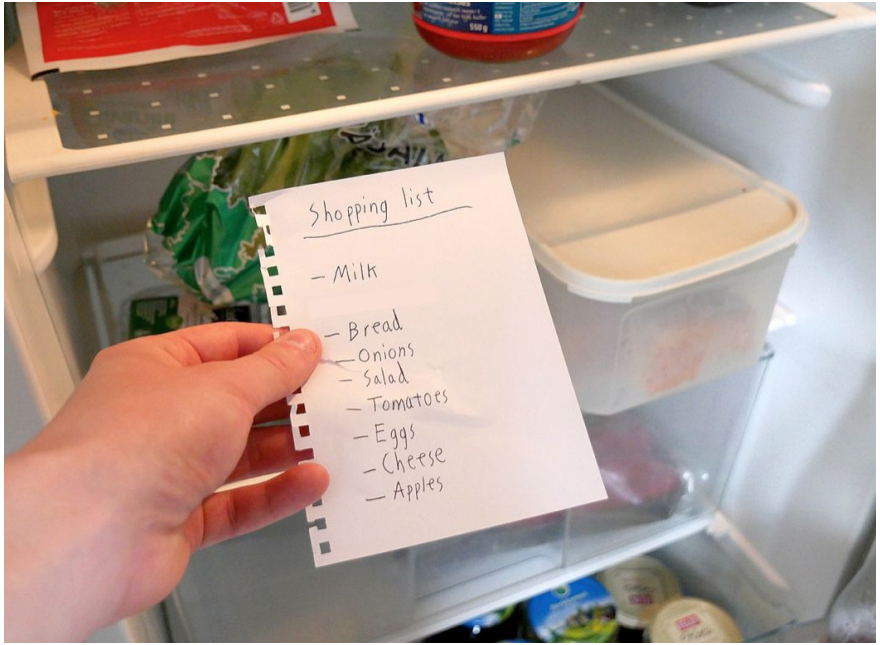
Imagine if you were designing a program for the entire school where 1000s of names need to be entered in a given program.

LISTS



A ‘list’ allows us to store as many different values as we want in under just ONE VARIABLE.

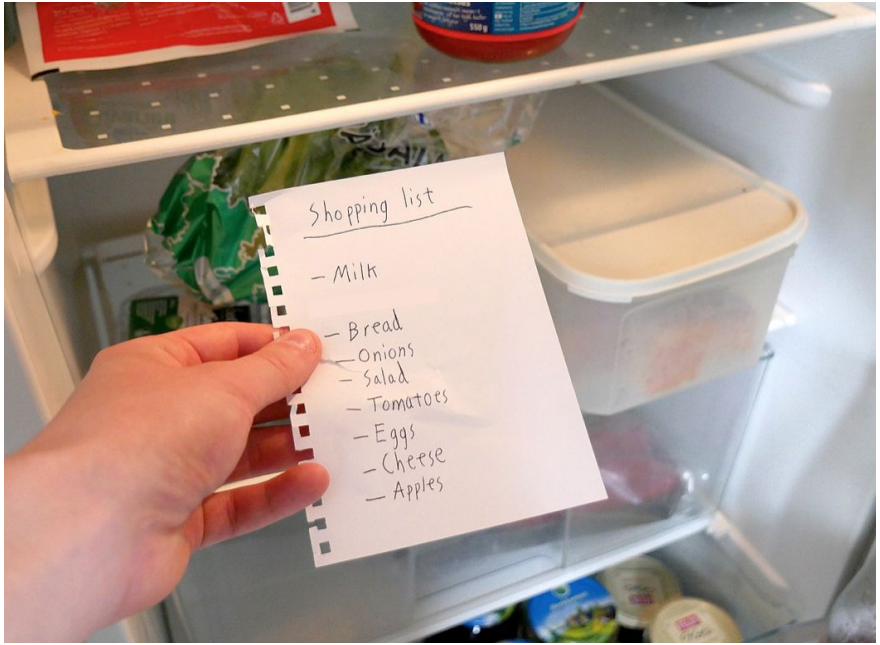
IN OUR REAL WORLD...



What do we mean when we use the word ‘list’? What comes to our mind when we think of the word ‘List’?

Can you provide a few examples of lists?

IN OUR REAL WORLD...



What do we mean when we use the word 'list'? What comes to our mind when we think of the word 'List'?

Lists are a collection of similar words or written items that fall under a common heading.

Can you provide a few examples of lists?

A **shopping list** is a collection of grocery items, shopping is the name of the list while grocery items is the content inside it.
A **homework list** is a collection of topics/problems.
A **to-do list** is a collection of tasks for the day.

COMPUTER LISTS

ProgrammingLanguages = [“Java”, “Python”, “C++”, “C”, “Ruby”]

What is the name of this list?

What kind of box are we using to declare a list?

How many values does this list hold?

What if we had to give this list a different name?

Inside which symbols are elements of the lists written? How are they seperated?

COMPUTER LISTS

ProgrammingLanguages = [“Java”, “Python”, “C++”, “C”, “Ruby”]

What is the name of this list?

Name of this list is **ProgrammingLanguages**.

What kind of box are we using to declare a list?

We are using a **process box**. (Rectangle).

How many values does this list hold?

This list holds 5 values.

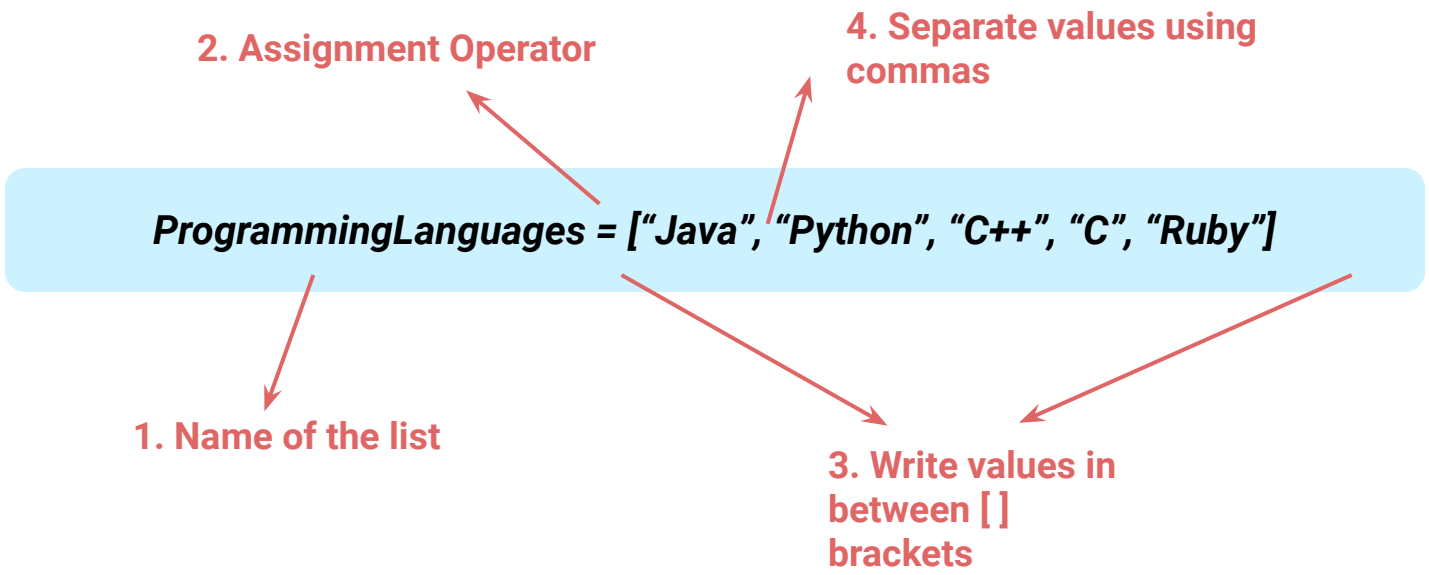
What if we had to give this list a different name?

Lists follow the same naming rules that are used for variables.

Inside which symbols are elements of the lists written? How are they seperated?

They are written inside square brackets, separated using commas.

SYNTAX


2. Assignment Operator
4. Separate values using commas
ProgrammingLanguages = [“Java”, “Python”, “C++”, “C”, “Ruby”]
1. Name of the list
3. Write values in between [ ] brackets

OTHER EXAMPLES

Emptylist = [ ]

ListOfIntegers = [45, 67, 99, 134, 4, 22]

ListOfStrings = [“Red”, “Blue”, “Yellow”, “Green”]

MixedList = [55, “Green”, 192.45, “Yellow”]

PRACTICE

Make a list of all the eight planets in the solar system. Name this list SolarSystem.

Make a list of the first 10 odd numbers. Name the list as OddNumbers.

PRACTICE

Make a list of all the eight planets in the solar system. Name this list SolarSystem.

Make a list of the first 10 odd numbers. Name the list as OddNumbers.

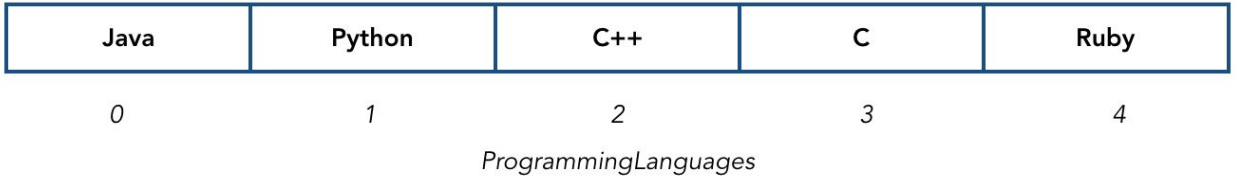
SolarSystem = [Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune]

OddNumbers = [1, 3, 5 ,7, 9, 11, 13, 15, 17, 19]

USING A LIST'S VALUES

ProgrammingLanguages = ["Java", "Python", "C++", "C", "Ruby"]

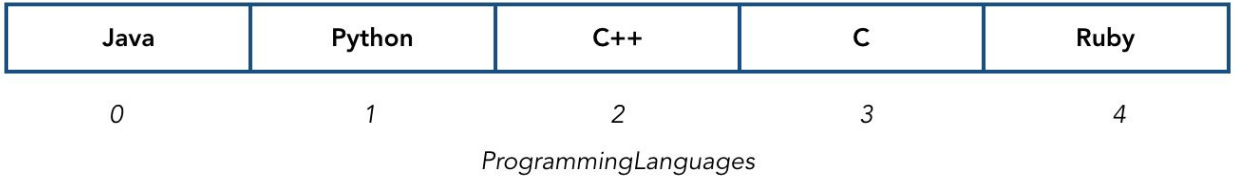
Memory diagram -



USING A LIST'S VALUES

ProgrammingLanguages = ["Java", "Python", "C++", "C", "Ruby"]

Memory diagram -



What is the numerical value given to the first data point 'Java'?

Roll Number of students in a classroom

In computer lists, a MAJOR difference in indexing is that it always starts with 0. We generally number things starting from one, but in lists, numbering always starts from 0.

Syntax

listname[IndexNumber]

```
ProgrammingLanguages = ["Java", "Python", "C++", "C", "Ruby"]
```



```
print(ProgrammingLanguages[1])
```

What will print on the screen in the following example?

```
ProgrammingLanguages = ["Java", "Python", "C++", "C", "Ruby"]
```

↓

```
print(ProgrammingLanguages[1])
```

What will print on the screen in the following example?

In the above syntax, we want to use the element with index number '1' - which is Python. And hence, "Python" will print on the screen.

PRACTICE

Is the following sentence correct or incorrect?

In a list, OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”], the syntax to access “Dal” is OurMenu[3]

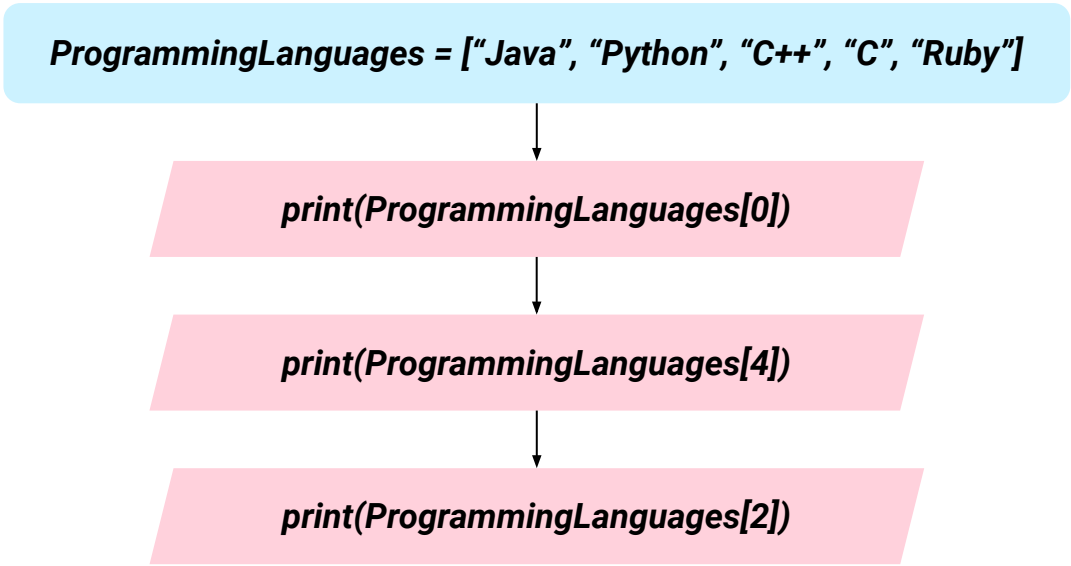
PRACTICE

Is the following sentence correct or incorrect?

In a list, OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”], the syntax to access “Dal” is OurMenu[3]

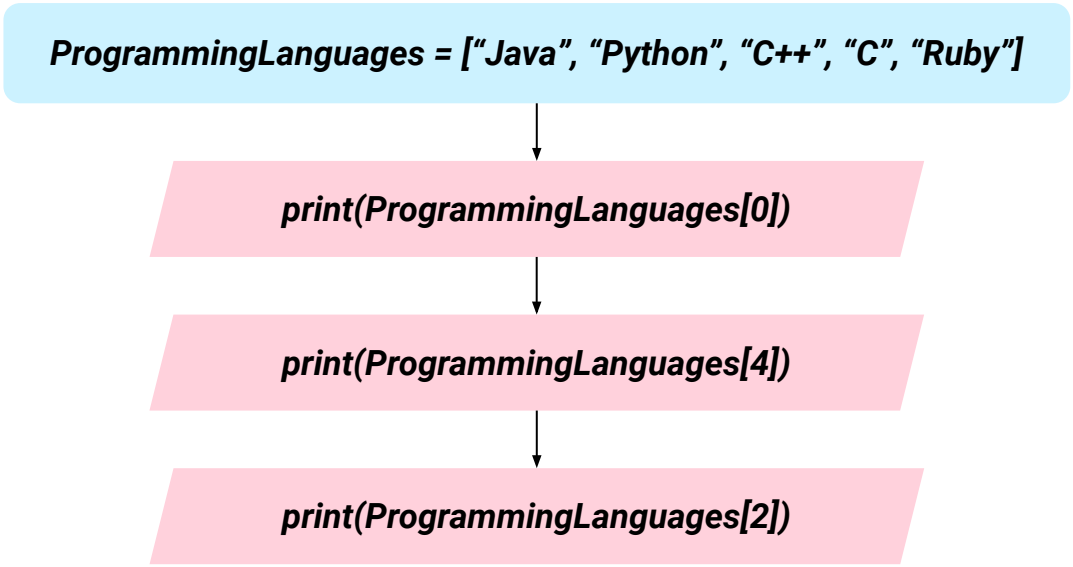
False, to access the value of Dal, we have to use OurMenu[2]

PRACTICE



What will be the output of the following flowchart?

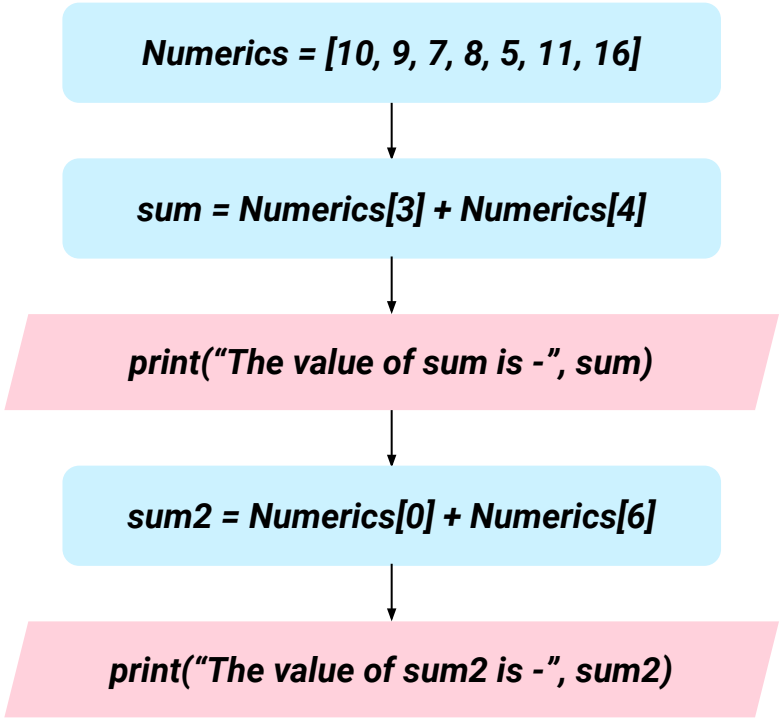
PRACTICE



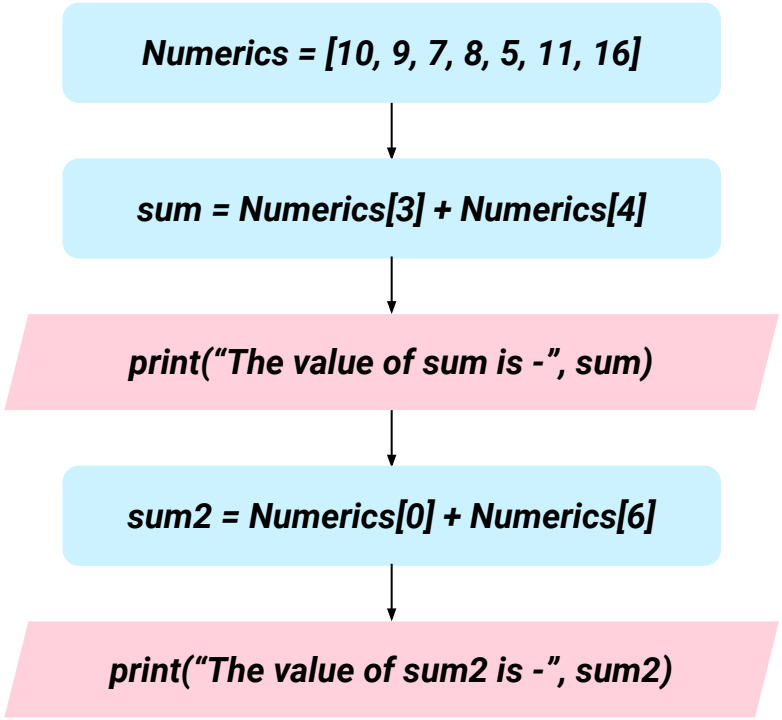
What will be the output of the following flowchart?

Java
Ruby
C++

PRACTICE



What will be the output of the following flowchart?



PRACTICE

What will be the output of the following flowchart?

The value of sum is - 13
The value of sum2 is - 26

INDEPENDENT PRACTICE

Create a flowchart for the following task.
Make a list containing the months of a year and display the value at the number entered by the user.
Example 1 -
Enter a number - -> 5
May

Example 2 -
Enter a number - -> 10
October

PRINTING A VARIABLE

What is the syntax we use to print the value of a variable? Let's say the name of the variable is SurajAge

PRINTING A VARIABLE

What is the syntax we use to print the value of a variable? Let's say the name of the variable is SurajAge

print(SurajAge)

PRINTING A LIST

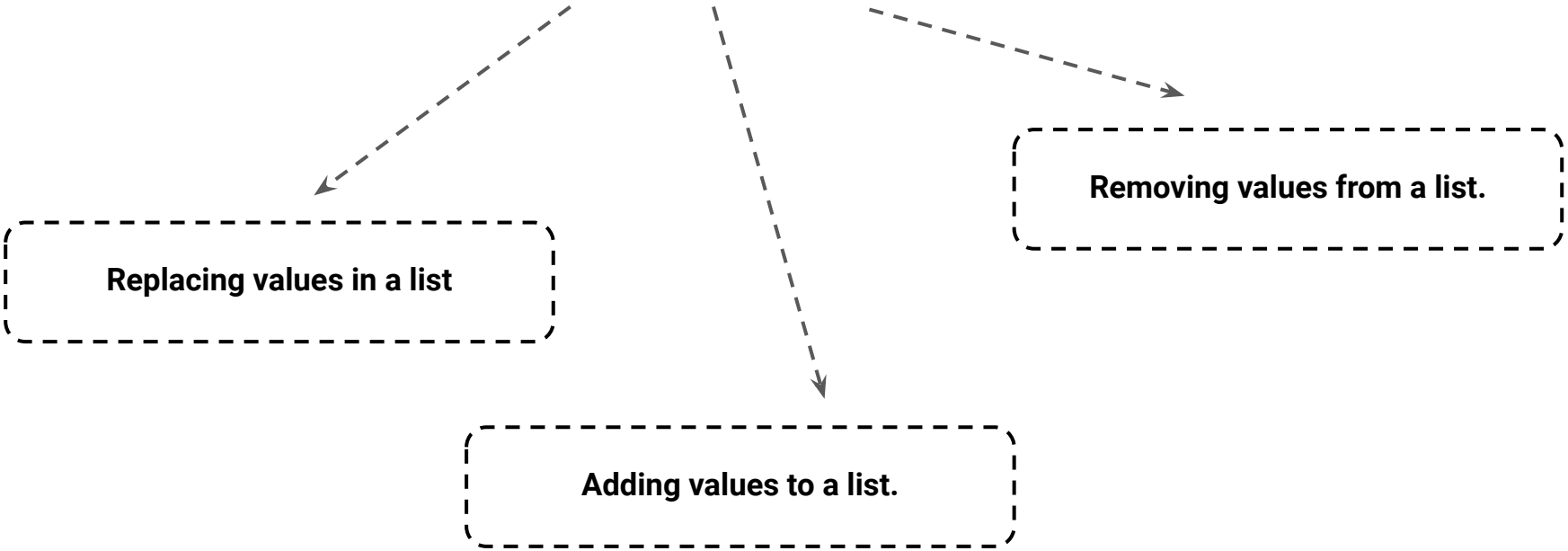
```
ProgrammingLanguages = ["Java", "Python", "C++", "C", "Ruby"]
```



```
print(ProgrammingLanguages)
```

True or False, Is the method similar to printing a variable's value?

EDITING A LIST



REPLACING VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

This is a list of menu items for a small restaurant. But let’s say that on a particular day, the Restaurant isn’t serving Biryani, and instead it’s serving Pulao.

We have to remove this value and replace it.

OurMenu[5] = “Pulao”

REPLACING VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

In this list, we want to remove Roti and replace it with Paratha in its place. Write the instruction for the same

_____

REPLACING VALUES

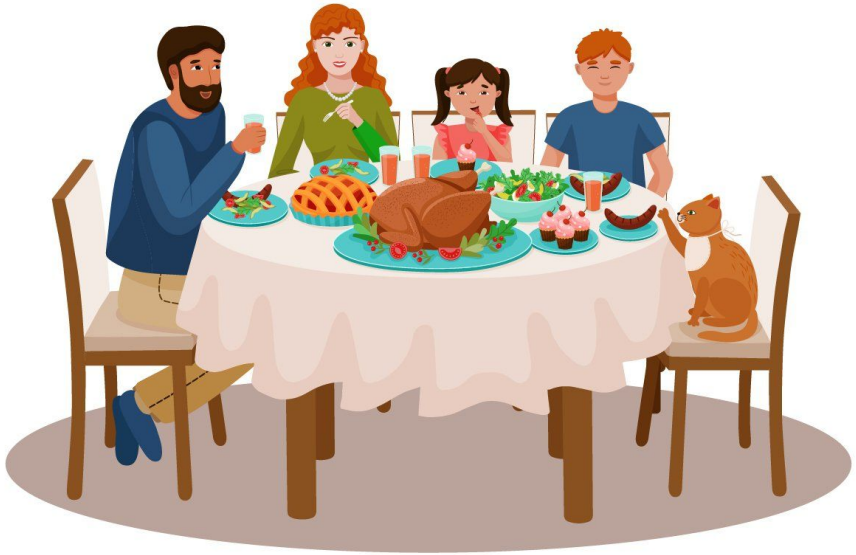
OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

In this list, we want to remove Roti and replace it with Paratha in its place. Write the instruction for the same

OurMenu[0] = “Paratha”

ADDING NEW VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]



Let's say that in addition to “Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”, the restaurant is also planning to serve “Vegetable Soup”.

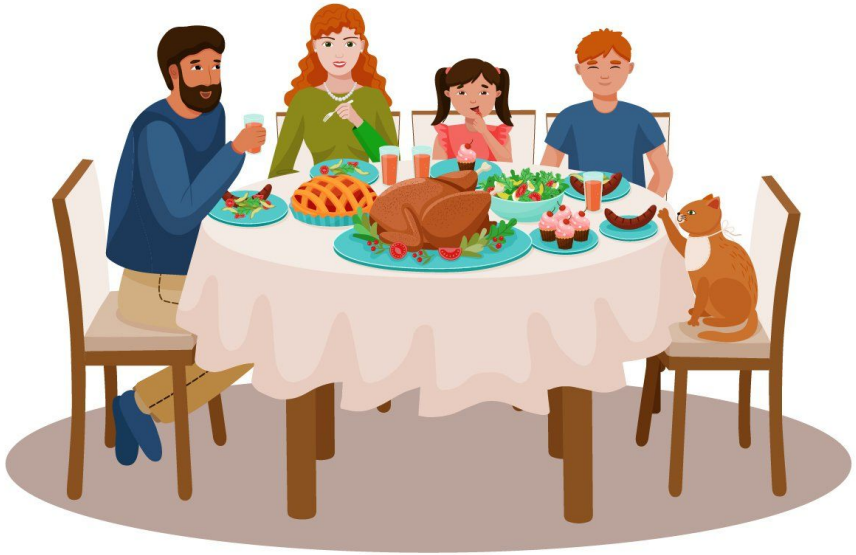
OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

↓

OurMenu.append(“Vegetable Soup”)

ADDING NEW VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]



Write an operation to add “Cheese Platter” to the new menu.

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

↓

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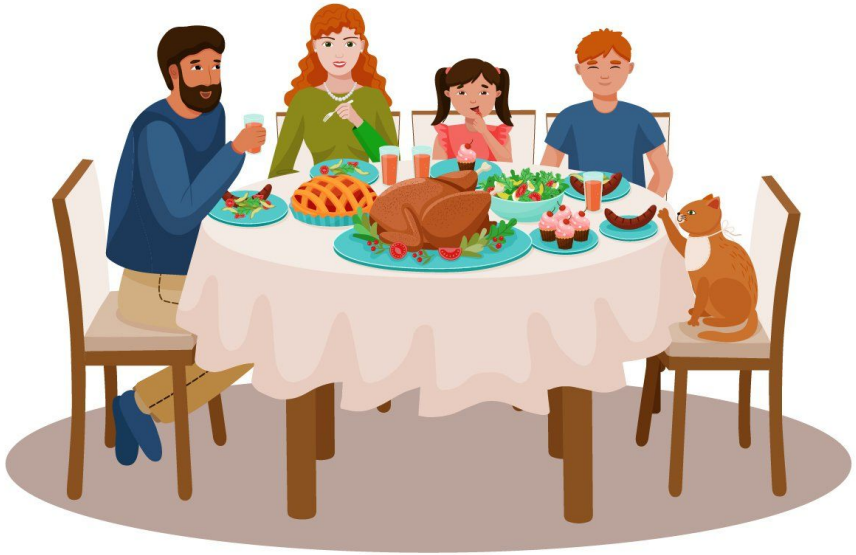
ADDING NEW VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]



Write an operation to add “Cheese Platter” to the new menu.

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

↓

OurMenu.append(“Cheese Platter”)

REMOVING VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

On a particular day, the restaurant ran out of rice and had to remove Biryani and rice from the menu

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

↓

OurMenu.remove(“Biryani”)

↓

OurMenu.remove(“Rice”)

REMOVING VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

On another day, the restaurant ran out of Dal and wants to remove the same from the menu. Can you write the syntax to do so?

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

↓

_____

REMOVING VALUES

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

On another day, the restaurant ran out of Dal and wants to remove the same from the menu. Can you write the syntax to do so?

OurMenu = [“Roti”, “Naan”, “Dal”, “Rice”, “Raita”, “Biryani”]

↓

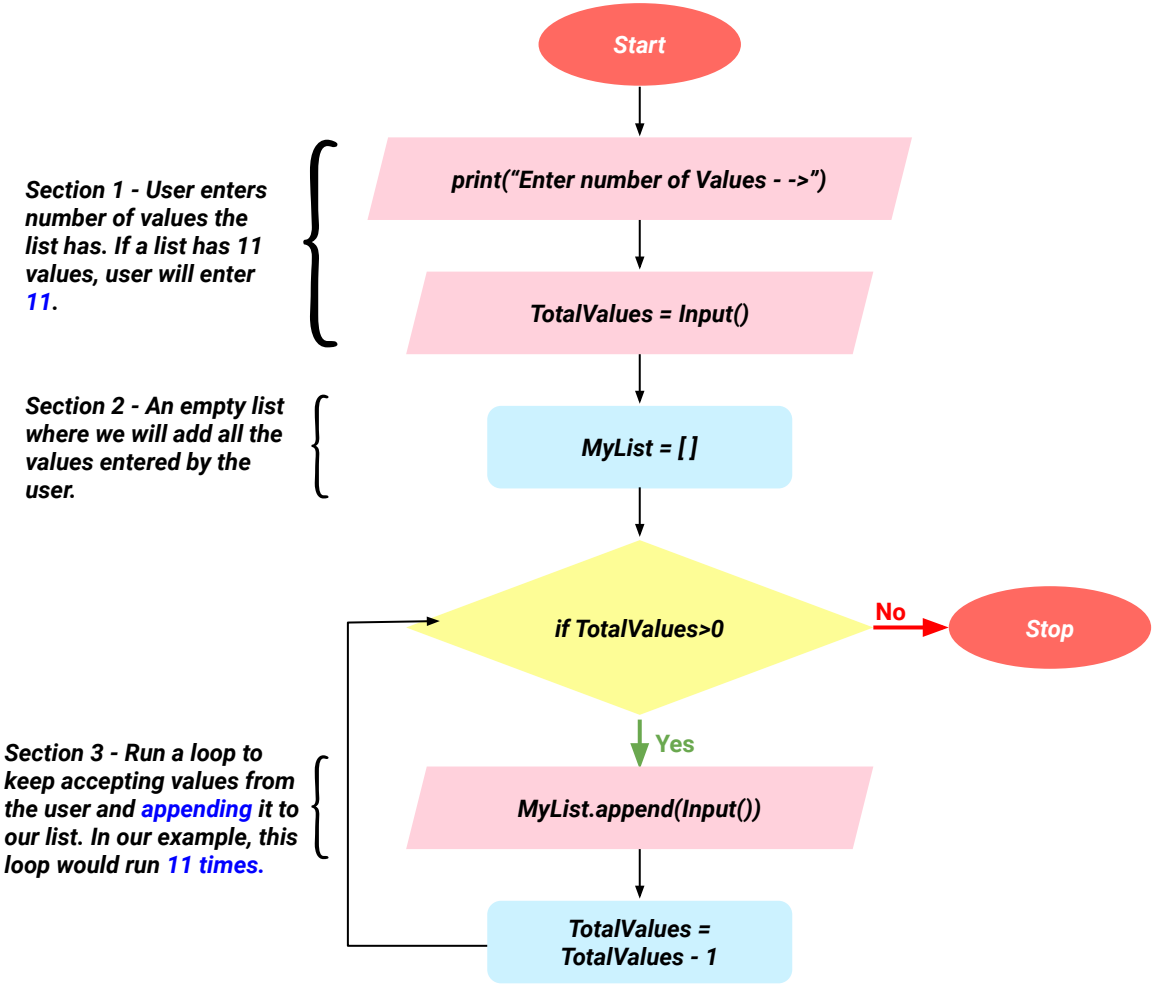
OurMenu.remove(“Dal”)

INDEPENDENT PRACTICE

Question - Design a single flowchart to perform the following operations

1. Create a list of five colors for cars - Red, Black, White, Yellow, Blue.
2. The company decided that Blue Cars aren't selling well and want to replace it with "Navy Blue". Update the list with this change. Print it.
3. A recent customer survey indicates that customers would like the car to come in "Silver" colour as well. The company has decided to add this color as will. Add this color to the list. Print it.
4. Oh no!! Cars in Red aren't selling well and the company has decided to remove this option of color. Remove the color from the list as well.
5. Print the list now

ACCEPTING VALUES FROM THE USER



USING LISTS WITH LOOPS

Problem 1 - Write a program to check if a name is present in a given list or not.

Let's break down how we will approach this problem -

1. We make a list and maintain some names to it.
2. We will accept a name from the user, this is the name we have to search in our list.
3. We start a loop to travel through the list, one name at a time, and check if that name matches with the name entered by the user. If present, we note that the name is present and print "The name is Present." If the list gets over, and the name is not present, we print "The name is Absent".


Start
ListOfNames = ["Aaryan", "Binita", "Sejal", "Varsha", "Rahul", "Mehul"]
print("Enter a name you want to search - ")
SearchName = input()
i = 0, status = "Absent"
If i < len(ListOfNames)
No
print("The name is ", status)
Stop
Yes
if ListOfNames[i] = = SearchName
Yes
No
status = "Present"
i = i + 1

INDEPENDENT PRACTICE

Write a flowchart for a user who wants to enter all Solar Systems in a list.

Given a list [‘a’, 1, ‘2’, 5, ‘b’, ‘q’]. Print the last ‘n’ elements of the given list. ‘n’ accepted from the user.

Make a list to accept 10 numbers from the user, print the sum of all even numbers, and the sum of all odd numbers.

Sample Input -
[35, 40, 201, 50, 66, 78, 33, 31, 13, 18]

Sample Output -
Sum of Even Numbers - 252
Sum of Odd Numbers - 313

Given a list ([1,2,3,4,5,6,7]), take a number from the user and check whether it exists in the list or not.

INDEPENDENT PRACTICE

Question -
Make a list to accept 10 numbers from the user, and print the count of positive numbers, negative numbers, and zero.
Sample Input -
[35, - 40, - 201, 0, 66, - 78, 33, 0, - 13, 18]

Sample Output -
Count of Positive Numbers - 4
Count of Negative Numbers - 4
Count of Zeroes - 2

INDEPENDENT PRACTICE

Write a program to store the names of 25 people in your classroom, in reverse order.

Input:

Ram
Shyam
Sam
Ravi
Pallavi

Output:

Pallavi
Ravi
Sam
Shyam
Ram