

Assignment 01 :

Create a Java program that retrieves an element from a specified index in an ArrayList.

The program should allow adding elements to the list and ensure that only String and Integer types are accepted.

If an invalid element type is added, the program should display an error message. When retrieving an element,

if the specified index is invalid, the program should handle the exception gracefully and provide an appropriate error message.

Requirements

Method Definition:

Method Name: retrieveElement

Parameters: ArrayList<Object> arrayList, int index

Return Type: Object

Method Type: static

Functionality: Retrieves the element at the specified index from the given ArrayList.

If the index is invalid, it should throw an IndexOutOfBoundsException.

Input and Validation:

The program should prompt the user to enter the number of elements to add to the list.

For each element, the program should validate whether the element is of type String or Integer.

If not, it should display a message: "Element is not valid as per requirement."

After all elements are added, the program should prompt the user to enter the index of the element they want to retrieve.

Exception Handling:

If the specified index is invalid, the program should catch the IndexOutOfBoundsException and display a message:

"The index in which you are searching is not available."

Test Cases

1. Valid Elements and Index:

Input:

Enter the number of elements you want to add to the list: 3

Enter element 1: 42
Enter element 2: Hello
Enter element 3: 27
Enter the index you want to retrieve: 1

Output:
Element at index 1: Hello

2.For Invalid Element Type:

Input:

Enter the number of elements you want to add to the list: 3
Enter element 1: 42
Enter element 2: [2.5]
Enter element 3: Hello
Enter the index you want to retrieve: 2

Output:
Element is not valid as per requirement.
Element at index 2: Hello

3.Invalid Index:

Input:

Enter the number of elements you want to add to the list: 2
Enter element 1: 42
Enter element 2: World
Enter the index you want to retrieve: 5

Output:
The index in which you are searching is not available.

Assignment 02

Create a simple program in Java that demonstrates the concept of inheritance. Define a base class Animal with basic attributes and methods, and then create two derived classes Dog and Cat that inherit from Animal. Each derived class should have additional attributes and methods specific to them. The program should create instances of Dog and Cat and display their attributes and behaviors.

Requirements

Create a base class Animal with:

A string field name.
 An integer field age.
 A constructor that initializes name and age.
 A method makeSound that prints a generic sound message.
 A method displayInfo that prints the animal's name and age.

Create a derived class Dog that extends Animal with:

A string field breed.
 A constructor that initializes name, age, and breed.
 An overridden makeSound method that prints "Woof!".
 A method fetch that prints a fetching message.

Create a derived class Cat that extends Animal with:

A string field color.
 A constructor that initializes name, age, and color.
 An overridden makeSound method that prints "Meow!".
 A method scratch that prints a scratching message.

Requirements

Main class to create a list of Animal objects.

Add instances of Dog and Cat to the list.

Iterate through the list and invoke the makeSound and displayInfo methods on each object to demonstrate polymorphism.

| Test Case |
|---|
| Collection Test: |
| Input: No input needed. |
| |
| Note: |
| if the arraylist object is not created or |
| if the arraylist don't have any element then |
| don't fetch the result from the arraylist and |
| give the status as: |
| |
| "list don't have any data!!!" |

otherwise print the data present in the list

Output:

Animal: Bella, Age: 3

Sound: Woof!

Animal: Whiskers, Age: 2

Sound: Meow!
