**Assignment: JUnit Testing**

**Write any java code and write two test classes for that code using JUnit framework. Create a test suite with the two test classes and then create a runner class that runs the test suite. In each test class,**

**a) You should cover the following: positive test case, negative test cases and a test case that 'will' fail.**

**b) Use a method to initialize all the variables required for test cases in a single method and make sure to annotate this method with corresponding annotation.**

**Answer:**

**Java Program of BinarySearch**

**Main.java**

import java.util.Scanner;

public class Main {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of elements in the array");

int n = sc.nextInt();

int[] arr = new int[n];

System.out.println("Enter the elements of the array");

for (int i = 0; i < n; i++) {

arr[i] = sc.nextInt();

}

System.out.println("Enter the element to be searched");

int key = sc.nextInt();

int index = binarySearch(arr, key);

if (index == -1)

System.out.println("Element not found");

else

System.out.println("Element found at index " + index);

sc.close();

}

public static int binarySearch(int[] arr, int key) {

int low = 0;

int high = arr.length - 1;

while (low <= high) {

int mid = (low + high) / 2;

if (key == arr[mid]) {

return mid;

} else if (key < arr[mid]) {

high = mid - 1;

} else {

low = mid + 1;

}

}

return -1;

}

}

**BinarySeachTest1.java**

import org.junit.Assert;

import org.junit.Before;

import org.junit.Test;

public class BinarySearchTest1 {

private int[] arr;

private int key;

@Before

public void setUp() {

arr = new int[]{1, 2, 3, 4, 5, 6, 7, 8, 9, 10};

key = 5;

}

@Test

public void testBinarySearch() {

int index = Main.binarySearch(arr, key);

Assert.assertEquals(4, index);

}

@Test

public void testBinarySearchNegative() {

int index = Main.binarySearch(arr, 11);

Assert.assertEquals(-1, index);

}

@Test

public void testBinarySearchFail() {

int index = Main.binarySearch(arr, key);

Assert.assertEquals(5, index);

}

}

**BinarySearchTest2.java**

import org.junit.Assert;

import org.junit.Before;

import org.junit.Test;

public class BinarySearchTest2 {

private int[] arr;

private int key;

@Before

public void setUp() {

arr = new int[]{2,4,6,8,9,10,12,14,16,18,20};

key=10;

}

@Test

public void testBinarySearch() {

int index = Main.binarySearch(arr, key);

Assert.assertEquals(5, index);

}

@Test

public void testBinarySearchNegative() {

int index = Main.binarySearch(arr, 22);

Assert.assertEquals(-1, index);

}

@Test

public void testBinarySearchFail() {

int index = Main.binarySearch(arr, key);

Assert.assertEquals(7, index);

}

}

**TestSuite.java**

import org.junit.runner.RunWith;

import org.junit.runners.Suite;

@RunWith(Suite.class)

@Suite.SuiteClasses({

BinarySearchTest1.class ,BinarySearchTest2.class

})

public class TestSuite {

}

**TestRunner.java**

import org.junit.runner.JUnitCore;

import org.junit.runner.Result;

import org.junit.runner.notification.Failure;

public class TestRunner {

public static void main(String[] args){

Result result=JUnitCore.runClasses(TestSuite.class);

for (Failure failure : result.getFailures()) {

System.out.println(failure.toString());

}

System.out.println(result.wasSuccessful());

}

}