DSA Assignment 2

1.

**package** default1;

**public** **class** star {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

**int** n =3 ;

**for**(**int** i =1 ; i<=n ; i++) {

**for**(**int** j =1 ; j<=i;j ++) {

System.***out***.print("\*");

}

System.***out***.println();

}

}

}

2.

**package** default1;

**public** **class** two {

**public** **static** **int** removeDuplicates(**int**[] nums) {

**if** (nums.length == 0) **return** 0; // Check if the array is empty

**int** uniqueIndex = 1; // Pointer for the position of the next unique element

**for** (**int** i = 1; i < nums.length; i++) {

**if** (nums[i] != nums[i - 1]) { // Check if the current element is different from the previous one

nums[uniqueIndex] = nums[i]; // Move the unique element to the uniqueIndex position

uniqueIndex++; // Move the pointer to the next position

}

}

**return** uniqueIndex; // The length of the array without duplicates

}

**public** **static** **void** main(String[] args) {

**int**[] arr1 = {1, 1, 2};

**int** newLength1 = *removeDuplicates*(arr1);

System.***out***.println("New length: " + newLength1); // Output: 2

}

}

3.

**package** default1;

**public** **class** RemoveWhiteSpaces {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

String s1 = "Java Programing";

String s2 = "Hello World";

String new1 = s1.replace(" \\s", " ");

String new2 = s2.replace("//s", " ");

System.***out***.println("Original string is " + s1 + " New is " + new1);

System.***out***.println("Original string is " + s2 + " New is " + new2);

}

}

4.

**package** default1;

**public** **class** four {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

String s1 = "hello";

**for**(**int** i = s1.length()-1; i>=0; i--) {

System.***out***.print(s1.charAt(i));

}

}

}

5.

**package** default1;

**public** **class** five {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

**int** array[] = {1,2, 3, 4};

**int** start = 0;

**int** end = array.length-1;

**while**(start<end) {

**int** temp = array[start];

array[start] = array[end];

array[end] = temp;

start ++;

end --;

}

**for**(**int** i = 0; i<array.length; i++) {

System.***out***.print(array[i]);

}

}

}

6.

**package** default1;

**public** **class** six {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

String s1 = "Hello world";

String s2 = "";

**for** (**int** i = 5 ; i<s1.length(); i++) {

s2 += s1.charAt(i);

}

s2+= " ";

**for**(**int** i = 0 ; i<=4; i++) {

s2+=s1.charAt(i);

}

System.***out***.println(s2);

}

}

7.

**package** default1;

**public** **class** seven {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

**int** number = 12345;

String s1 = Integer.*toString*(number);

**for**(**int** i = s1.length()-1 ; i>= 0; i--) {

System.***out***.print(s1.charAt(i));

}

}

}

8.

**package** default1;

**public** **class** eight {

**public** **static** **void** main(String[] args) {

**int** n1 = 5;

**int**[][] queries1 = { {1, 2, 100}, {2, 5, 100}, {3, 4, 100} };

System.***out***.println("Output: " + *arrayManipulation*(n1, queries1));

**int** n2 = 4;

**int**[][] queries2 = { {1, 3, 50}, {2, 4, 70} };

System.***out***.println("Output: " + *arrayManipulation*(n2, queries2));

}

**public** **static** **long** arrayManipulation(**int** n, **int**[][] queries) {

**long**[] array = **new** **long**[n + 1];

// Apply the difference array technique

**for** (**int**[] query : queries) {

**int** start = query[0];

**int** end = query[1];

**int** value = query[2];

array[start - 1] += value;

**if** (end < n) {

array[end] -= value;

}

}

**long** max = 0;

**long** current = 0;

**for** (**long** value : array) {

current += value;

**if** (current > max) {

max = current;

}

}

**return** max;

}

}

9.

**package** default1;

**public** **class** nine {

**public** **static** **void** main(String[] args) {

String input1 = "madam";

String input2 = "hello";

System.***out***.println("Input: " + input1);

System.***out***.println("Output: " + *isPalindrome*(input1));

System.***out***.println("Input: " + input2);

System.***out***.println("Output: " + *isPalindrome*(input2));

}

**public** **static** **boolean** isPalindrome(String str) {

**int** left = 0;

**int** right = str.length() - 1;

**while** (left < right) {

**if** (str.charAt(left) != str.charAt(right)) {

**return** **false**;

}

left++;

right--;

}

**return** **true**;

}

}

10.

**package** default1;

**import** java.util.Arrays;

**public** **class** ten {

**public** **static** **void** main(String[] args) {

**int**[] arr1 = {1, 2, 3, 4, 5};

**int** d1 = 2;

System.***out***.println("Input: " + Arrays.*toString*(arr1));

System.***out***.println("Output: " + Arrays.*toString*(*rotateLeft*(arr1, d1))); // Output: [3, 4, 5, 1, 2]

**int**[] arr2 = {10, 20, 30, 40};

**int** d2 = 1;

System.***out***.println("Input: " + Arrays.*toString*(arr2));

System.***out***.println("Output: " + Arrays.*toString*(*rotateLeft*(arr2, d2))); // Output: [20, 30, 40, 10]

}

**public** **static** **int**[] rotateLeft(**int**[] arr, **int** d) {

**int** n = arr.length;

d = d % n;

**int**[] rotatedArr = **new** **int**[n];

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

rotatedArr[i] = arr[(i + d) % n];

}

**return** rotatedArr;

}

}