Lab 09 Searching and Sorting

(1)

**import java.util.Scanner;**

**public class Task1 {**

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

**Scanner key1 = new Scanner(System.in);**

**int num = key1.nextInt();**

**int ans = factorial(num);**

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

**}**

**public static int factorial(int n){**

**if(n==0){**

**return 1;**

**}**

**else{**

**return n\*factorial(n-1);**

**}**

**}**

**}**

(2)

**import java.util.Scanner;**

**public class Task2 {**

**static int n1=0,n2=1,n3=0;**

**public static void fib(int n){**

**if(n>0){**

**n3 = n1 + n2;**

**n1 = n2;**

**n2 = n3;**

**System.out.print(" "+n3);**

**fib(n-1);**

**}**

**}**

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

**Scanner key1 = new Scanner(System.in);**

**int num = key1.nextInt();**

**System.out.print(n1+" "+n2);**

**fib(num-2);**

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

**}**

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**public class Task3 {**

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

**int[] a = {1,3,8,12,14,18,21,26,33,41};**

**int key = 18;**

**int index = binarySearch(a,key,0,a.length-1);**

**System.out.println(key+" is at index "+index);**

**}**

**private static int binarySearch(int[] a, int key, int start, int end) {**

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

**if (start<end) {**

**int mid = (start + end) / 2;**

**if (key > a[mid]) {**

**return binarySearch(a, key, mid + 1, end);**

**} else if (key < a[mid]) {**

**return binarySearch(a, key, start, mid - 1);**

**} else if (key == a[mid]) {**

**return mid;**

**}**

**}**

**return -1;**

**}**

**}**

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**import java.util.Scanner;**

**public class Task4 {**

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

**Scanner key1 = new Scanner(System.in);**

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

**int num = key1.nextInt();**

**binaryConversion(num);**

**}**

**private static void binaryConversion(int num) {**

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

**if(num>0){**

**binaryConversion(num/2);**

**System.out.print(num%2+" ");**

**}**

**}**

**}**

(5)

**import java.util.Scanner;**

**public class Task5 {**

**int foundAt=0;**

**public int searchList(Node h, Object find){**

**if(h!=null){**

**if(find.equals(h.key.toString())){**

**return foundAt;**

**}**

**else{**

**foundAt++;**

**return searchList(h.next, find);**

**}**

**}**

**return -1;**

**}**

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

**Scanner key=new Scanner(System.in);**

**Object[] a={10,20,30,40,50};**

**LinkedList aList=new LinkedList();**

**aList.add(a,0,5);**

**aList.printList(aList.head);**

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

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

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

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

**Task5 x=new Task5();**

**System.out.println("Enter a key to search");**

**Object f=key.next();**

**System.out.println("---- searching "+f+" ----");**

**int found=x.searchList(aList.head, f);**

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

**}**

**}**

(6)

**public class Task6 {**

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

**System.out.println(power(4,4));**

**}**

**public static int power(int m,int n){**

**if(n>1){**

**return m\*power(m,n-1);**

**}else{**

**return m;**

**}**

**}**

**}**

(7)

**public class Task7 {**

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

**System.out.println(power(4,4));**

**}**

**public static int power(int m,int n){**

**if(n==0){**

**return m\*power(m,n-1);**

**}else if(n==1){**

**return m;**

**}**

**else{**

**if(n%2==1){**

**return m\*power(m,n/2)\*power(m,n/2);**

**}**

**else{**

**return power(m,n/2)\*power(m,n/2);**

**}**

**}**

**}**

**}**

(8)

**public class Task8 {**

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

**int[] a = {5,3,7,1,4,2,6};**

**recursiveBubbleSort(a,0,a.length-1);**

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

**System.out.print(a[i]+" ");**

**}**

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

**}**

**private static void recursiveBubbleSort(int[] a, int start, int end) {**

**if (start<a.length) {**

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

**for (int j = start + 1; j < a.length; j++) {**

**if (a[start] > a[j]) {**

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

**a[start] = a[j];**

**a[j] = temp;**

**}**

**}**

**recursiveBubbleSort(a, start + 1, end);**

**}**

**}**

**}**

(9)

**public class Task9 {**

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

**System.out.println("---- Linked List aList ----");**

**Object[] a={10,20,30,40,50};**

**LinkedList aList=new LinkedList();**

**aList.add(a,0,5);**

**aList.printList(aList.head);**

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

**System.out.println("---- size of aList ----");**

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

**System.out.println("In reverse:");**

**reverseList(aList.head);**

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

**}**

**public static void reverseList(Node head){**

**if(head!=null){**

**reverseList(head.next);**

**System.out.print(head.key+" ");**

**}**

**}**

**}**