**JAVA CLASS AND OBJECTS**

1. Write the class Date having attributes like day, month & year. Add default & parameterized constructors. Add getters & setters. Add method to print the date. Add method to swap two dates.

**package** com.assignment;

**public** **class** Day11 {

Day11()

{

**this**.day="wednesday";

**this**.month="january";

**this**.year="2021";

}

Day11(String day,String month,String year)

{

**this**.day=day;

**this**.month=month;

**this**.year=year;

}

**private** String day;

**private** String month;

**private** String year;

**public** **void** setDay(String day)

{

**this**.day=day;

}

**public** **void** setmonth(String month)

{

**this**.month=month;

}

**public** **void** setyear(String year)

{

**this**.year=year;

}

**public** String getDay()

{

**return** day;

}

**public** String getMonth()

{

**return** month;

}

**public** String getyear()

{

**return** year;

}

**public** **static** **void** printDate()

{

Day11 day11 = **new** Day11();

String day=day11.getDay();

String month=day11.getMonth();

String year=day11.getyear();

System.***out***.println("stored date : " + day+ "/" + month+"/" + year);

}

**public** **static** **void** swapDate()

{

Day11 day11 = **new** Day11();

String day=day11.getDay();

String month=day11.getMonth();

String year=day11.getyear();

day11.setDay("thursday");

String day2=day11.getDay();

System.***out***.println(" before swapping = "+ day + " " + day2);

System.***out***.println("stored date : " + day+ "/" + month+"/" + year);

String temp;

temp=day;

day=day2;

day2=temp;

System.***out***.println(" after swapping ="+ day + " " + day2);

System.***out***.println("stored date : " + day+ "/" + month+"/" + year);

}

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

*printDate*();

*swapDate*();

}}

Output=

stored date : wednesday/january/2021

before swapping = sunday thursday

stored date : wednesday/january/2021

after swapping =thursday sunday

stored date : thursday/january/2021

2. Write a class ComplexNumber having attributes real & imaginary. Add functions like add, subtract, multiply & swap.

**package** com.assignment;

**public** **class** ComplexNumber {

**double** real,img;

ComplexNumber()

{

}

ComplexNumber(**double** real,**double** img){

**this**.real=real;

**this**.img=img;

}

**public** String getValue()

{

**return** real+"+"+img+"i";

}

**public** **static** ComplexNumber add( ComplexNumber c1,ComplexNumber c2)

{

ComplexNumber complex=**new** ComplexNumber();

complex.real=c1.real+c2.real;

complex.img=c1.img+c2.img;

**return** complex;

}

**public** **static** ComplexNumber sub( ComplexNumber c1,ComplexNumber c2)

{

ComplexNumber complex=**new** ComplexNumber();

complex.real=c1.real-c2.real;

complex.img=c1.img-c2.img;

**return** complex;

}

**public** **static** ComplexNumber mul( ComplexNumber c1,ComplexNumber c2)

{

ComplexNumber complex=**new** ComplexNumber();

complex.real=c1.real\*c2.real;

complex.img=c1.img\*c2.img;

**return** complex;

}

**public** **static** ComplexNumber swap( ComplexNumber c1, ComplexNumber c2) {

ComplexNumber complex = **new** ComplexNumber();

System.***out***.println("Before swaping-1 =" + c1.real + "+" + c1.img + "i");

complex.real=c1.real;

c1.real=c1.img;

c1.img=complex.real;

System.***out***.println("after swaping-1= " + c1.real + "+" + c1.img + "i");

complex.real=c2.real;

c2.real=c2.img;

c2.img=complex.real;

System.***out***.println("Before swaping-2 = " + c2.real + "+" + c2.img + "i");

System.***out***.println("after swaping-2= " + c2.real + "+" + c2.img + "i");

**return** complex;

}

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

{

ComplexNumber a=**new** ComplexNumber(5,6);

ComplexNumber b=**new** ComplexNumber(7,9);

ComplexNumber c=*add*(a,b);

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

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

ComplexNumber c1=*sub*(a,b);

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

System.***out***.println(c1.getValue());

ComplexNumber c2=*mul*(a,b);

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

System.***out***.println(c2.getValue());

System.***out***.println("\*\*\*\*\*swap\*\*\*");

*swap*(a,b);

}

}

3. Write a class Account & add methods like deposit, withdraw, print etc.

**package** com.assignment;

**public** **class** Account {

**private** **int** accountNumber;

**private** **double** currentBal;

Account(){

}

Account(**int** accountNumber)

{

**this**.accountNumber=accountNumber;

}

**public** **void** setAccountNumber(**int** accountNumber)

{

**this**.accountNumber=accountNumber;

}

**public** **int** getAccountNumber()

{

**return** accountNumber;

}

**public** **void** setCurrentBal(**double** currentBal)

{

**this**.currentBal=currentBal;

}

**public** **double** getCurrentBal()

{

**return** currentBal;

}

**public** **void** deposit(**double** amount)

{

**this**.currentBal += amount;

System.***out***.println("Your account is credited with rs-" +amount+"your balance is rs-" + currentBal );

}

**public** **void** Withdraw(**double** amount)

{

**if**(currentBal>=amount)

{

**this**.currentBal-=amount;

System.***out***.println("your balance amount after dedecting rs-" + amount + "is rs-" +currentBal);

}

**else**

System.***out***.println("insufficient fund");

}

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

Account account = **new** Account();

account.setAccountNumber(66167);

System.***out***.println("Your account number is :" + account.getAccountNumber());

account.setCurrentBal(10000.0);

account.deposit(5000.0);

account.Withdraw(13000.0);

}

}

4. Write a program to implement a Stack using arrays as follows-

class StackedArray {

int ary[];

push(--) { }

pop() {--) {}

}

**package** com.assignment;

**public** **class** StackedArray {

**int** arry[]=**new** **int**[5];

**int** top=0;

**public** **void** push(**int** data)

{

arry[top]=data;

top++; }

**public** **void** pop()

{

**int** data;

top--;

arry[top]=0;

}

**public** **void** show()

{

System.***out***.println("array elements are : " );

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

{

System.***out***.println("arr[" + i +"] ="+arry[i]);

}

}

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

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

StackedArray stackedarray = **new** StackedArray();

stackedarray.push(1);

stackedarray.push(2);

stackedarray.push(3);

stackedarray.push(4);

stackedarray.push(5);

stackedarray.show();

stackedarray.pop();

stackedarray.show();

stackedarray.pop();

stackedarray.show();

}}

5. Write a program to implement a Queue using arrays as follows-

class QueuedArray {

int ary[];

push(--) { }

pop() {--) {}

}

**package** com.assignment;

**public** **class** QueuedArray {

**int** size=5;

**int** [] arry=**new** **int**[size];

**int** rear=-1;

**int** front=-1;

**public** **void** enqueue(**int** data)

{

**if**(rear==size-1)

{

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

}

**if**(front==-1 && rear == -1) {

front++;

rear++;

arry[rear]=data;

}

**else**

rear++;

arry[rear]=data;

}

**public** **void** show()

{

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

{

System.***out***.println("arry["+ i + "] = " +arry[i]);

}

}

**public** **void** deque()

{

**if**(front==-1 && rear == -1)

{

System.***out***.println("array is empty");

}

**else** **if**(front==rear)

{

arry[front]=0;

front = rear =-1;

}

**else**

{

**for**(**int** i=0;i<=rear;i++)

{

arry[i]=arry[i+1];

}

--rear;

}

}

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

QueuedArray queue=**new** QueuedArray();

queue.enqueue(11);

queue.enqueue(15);

queue.enqueue(20);

queue.enqueue(25);

System.***out***.println("queue elements are :");

queue.show();

System.***out***.println("removing front element from queue");

queue.deque();

queue.show();

}

}

6. Write a single tone class. Confirm that single tone class cannot be inherited.

**package** com.assignment;

**public** **class** Singletone {

**private** **static** Singletone *singletone*=**null**;

**public** **static** Singletone singletoneMethod()

{

**if**(*singletone* == **null**)

{

System.***out***.println("object is null---create object");

*singletone*=**new** Singletone();

**return** *singletone*;

}

**else**

{

System.***out***.println("object cannot be created");

**return** *singletone*;

}

}

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

{

Singletone singletone=Singletone.*singletoneMethod*();

Singletone singletone1=Singletone.*singletoneMethod*();

}

}

Output:

queue elements are :

arry[0] = 11

arry[1] = 15

arry[2] = 20

arry[3] = 25

arry[4] = 0

removing front element from queue

arry[0] = 15

arry[1] = 20

arry[2] = 25

arry[3] = 0

arry[4] = 0

7. Write java classes to build doubly linked list. Add functionalities like add new node, insert node, delete node, count nodes & print linked list.

class Node {

Node previous;

Node next;

Int data;

}

**package** com.assignment;

**import** java.util.Scanner;

**public** **class** Node {

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

**public** **class** Node1{

**int** node;

Node1 previous;

Node1 next;

**public** Node1(**int** node) {

**this**.node = node;

} }

Node1 h, t = **null**;

**public** **void** add\_Node(**int** node) {

Node1 newNode = **new** Node1(node);

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

h = t = newNode;

h.previous = **null**;

t.next = **null**;

}

**else** {

t.next = newNode;

newNode.previous = t;

t = newNode;

t.next = **null**;

}

}

**public** **void** print\_list() {

Node1 current = h;

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

System.***out***.println("List is empty");

**return**;

}

System.***out***.println("Nodes of doubly linked list: ");

**while**(current != **null**) {

System.***out***.print(current.node + " ");

current = current.next;

}

System.***out***.println("\n");

}

**public** **void** countNodes() {

**int** counter = 0;

Node1 current = h;

**while**(current != **null**) {

counter++;

current = current.next;

}

System.***out***.println("Total no of nodes are:" +counter);

}

**public** **void** del\_node(Node1 del) {

**if**(h == **null** )

{

**return**;

}

**if**(h == del) {

h = del.next;

}

**if**(del.next != **null**) {

del.next.previous = del.previous;

}

**if**(del.previous != **null**) {

del.previous.next = del.next;

}

**return**;

}

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

Node n=**new** Node();

n.add\_Node(1);

n.add\_Node(4);

n.add\_Node(5);

n.add\_Node(6);

n.add\_Node(7);

n.add\_Node(8);

n.add\_Node(12);

n.print\_list();

n.countNodes();

}

}