

**NAME: VENNELA G**

**REG NO: 20BDS0146**

**COURSE CODE: CSE1007**

**LAB SLOT: L13+L14**

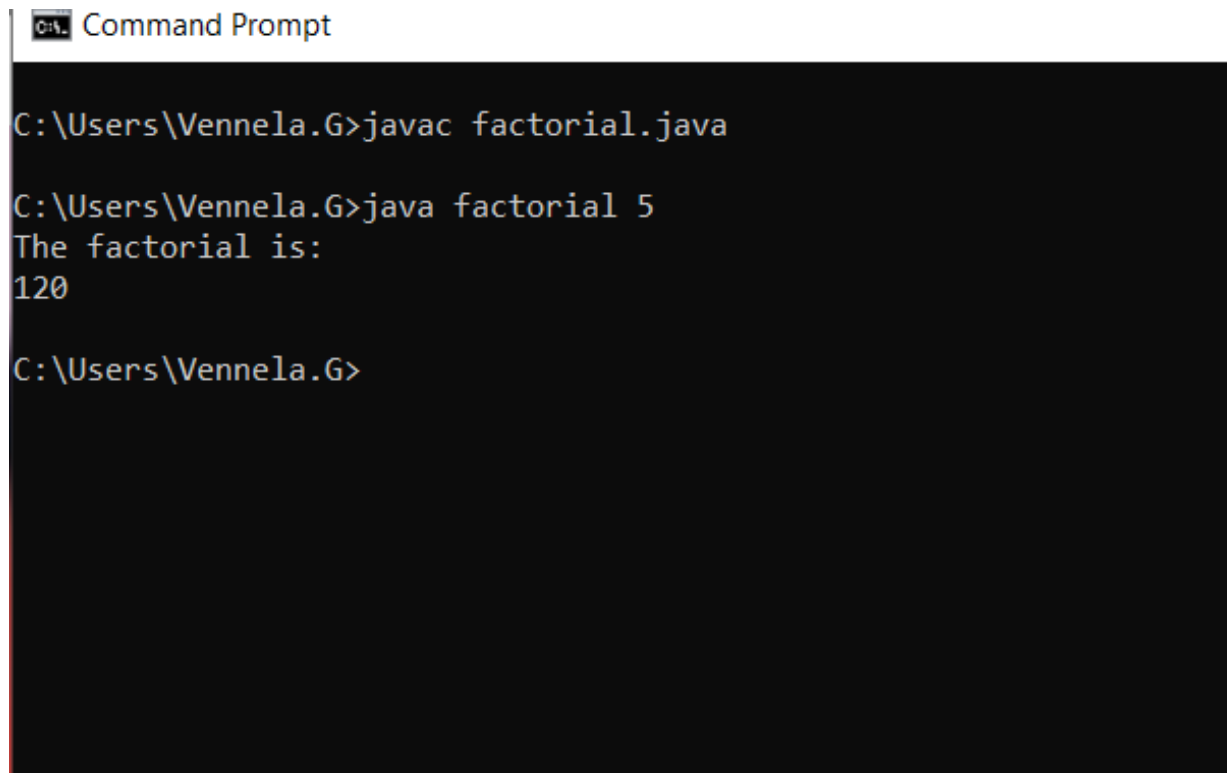
**LAB ASSIGNMENT: 1**

**1. Write a program to find the factorial of a number using command line arguments.**

```
import java.lang.*;

class factorial
{
    public static void main(String arg[])
    {int mul=1;
    int a=Integer.parseInt(arg[0]);
    for(int i=1;i<=a;i++)
    { mul=mul*i;
    }
    System.out.println("The factorial is:");
    System.out.println(mul);
    }
```

```
}
```



```
C:\Users\Vennela.G>javac factorial.java

C:\Users\Vennela.G>java factorial 5
The factorial is:
120

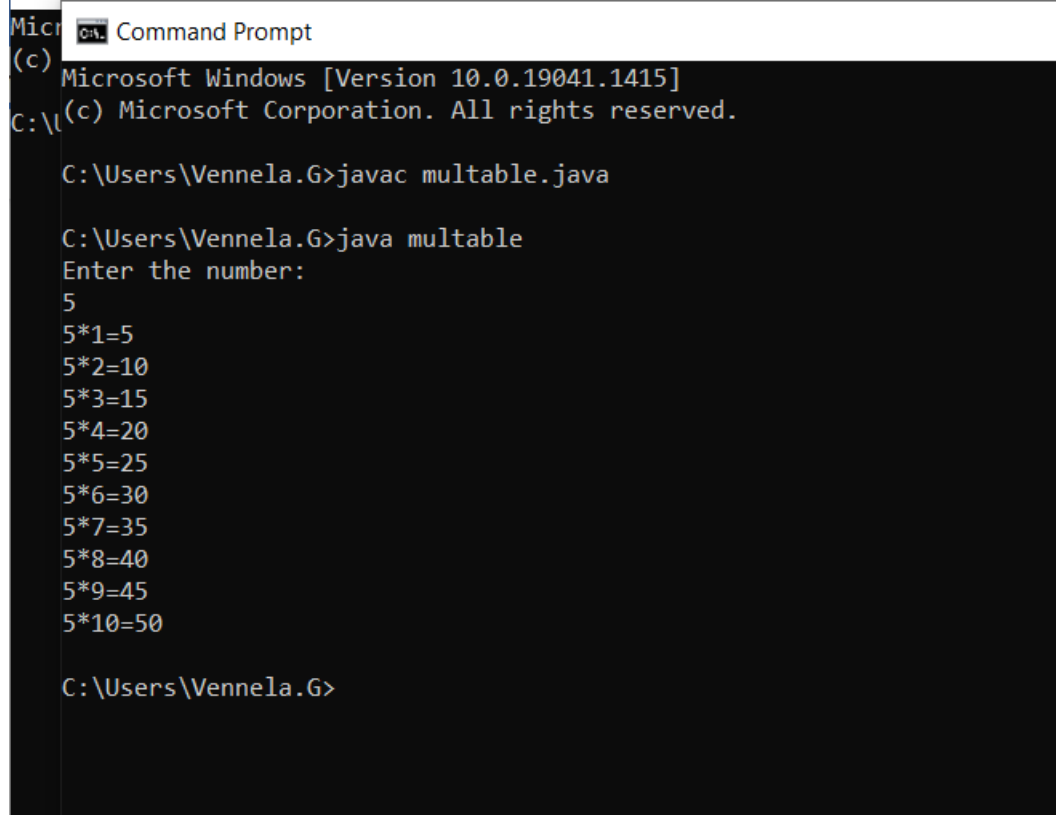
C:\Users\Vennela.G>
```

## 2. Write a program to print the multiplication table of a number.

```
import java.lang.*;
import java.util.Scanner;

class multable
{
    public static void main(String arg[])
    {Scanner sc=new Scanner(System.in);
    System.out.println("Enter the number:");
    int a=sc.nextInt();
```

```
for(int i=1;i<=10;i++)  
{  
System.out.println(a+"*"+i+"="+a*i);  
  
}  
  
}  
  
}
```



```
Microsoft Windows [Version 10.0.19041.1415]  
(c) Microsoft Corporation. All rights reserved.  
C:\Users\Vennela.G>javac multable.java  
  
C:\Users\Vennela.G>java multable  
Enter the number:  
5  
5*1=5  
5*2=10  
5*3=15  
5*4=20  
5*5=25  
5*6=30  
5*7=35  
5*8=40  
5*9=45  
5*10=50  
  
C:\Users\Vennela.G>
```

### 3. Write a program to check whether the given number is an Armstrong number or not.

```
import java.lang.*;  
import java.util.Scanner; ;
```

```
class Armstrong
{
    public static void main(String arg[])
    {int sum=0;
    int b;
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the number:");
    int a=sc.nextInt();
    b=a;
    while(a>0)
    { int z;
    z=a%10;
    sum=sum+(z*z*z);
    a=a/10;
    }
    if(b==sum)
    {System.out.println("It is Armstrong number");
    }
    else
    {System.out.println("It is not Armstrong number");
    }
    }
}
```

```
Command Prompt
Microsoft Windows [Version 10.0.19041.1415]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Vennela.G>javac Armstrong.java

C:\Users\Vennela.G>java Armstrong
Enter the number:
153
It is Armstrong number

C:\Users\Vennela.G>javac Armstrong.java

C:\Users\Vennela.G>java Armstrong
Enter the number:
200
It is not Armstrong number

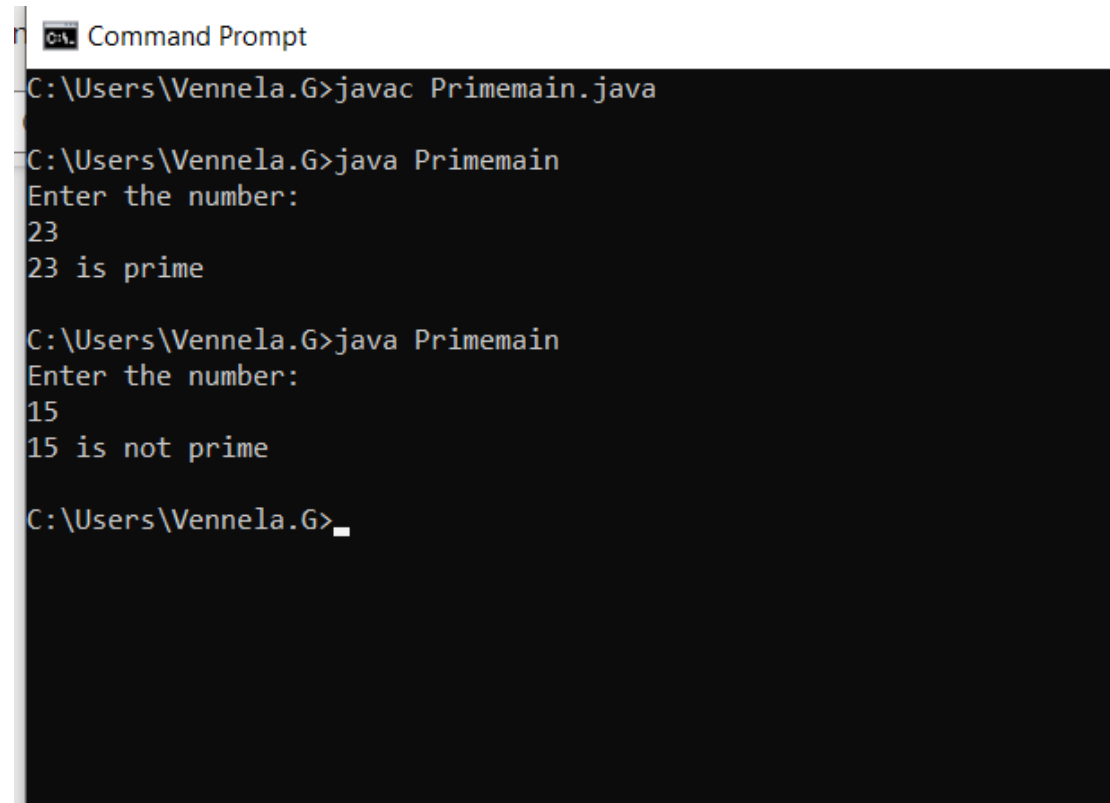
C:\Users\Vennela.G>
```

#### 4. Write a program to check whether the given number is a prime number or not

```
import java.lang.*;
import java.util.Scanner;

class Primemain
{
    public static void main(String arg[])
    {Scanner sc=new Scanner(System.in);
    System.out.println("Enter the number:");
    int num=sc.nextInt();
    int flag=0;
```

```
for(int i=2;i<num;i++)
{if(num%i==0)
{flag=0;
break;}
else
flag=1;
}
if(flag==1)
{System.out.println(num+" is prime");
}
else
{System.out.println(num+" is not prime");
}}
```



The screenshot shows a Windows Command Prompt window with the title "Command Prompt". The user is at the C:\Users\Vennela.G directory. They first run the command `javac Primemain.java` to compile the program. Then, they run `java Primemain`, which prompts them to "Enter the number:". They enter `23`, and the program outputs `23 is prime`. They then run `java Primemain` again, enter `15`, and the program outputs `15 is not prime`. The prompt ends with `C:\Users\Vennela.G>`.

```
Command Prompt
C:\Users\Vennela.G>javac Primemain.java
C:\Users\Vennela.G>java Primemain
Enter the number:
23
23 is prime

C:\Users\Vennela.G>java Primemain
Enter the number:
15
15 is not prime

C:\Users\Vennela.G>
```

## 5. Write a program to generate the following patterns.

i) 1            i  
    1 2  
    1 2 3  
    .

```
import java.lang.*;
```

```
class Series1
```

```
{
```

```
public static void main(String arg[])
```

```
{
```

```
for(int i=1;i<4;i++)
```

```
{
```

```
for(int j=1;j<=i;j++)
```

```
{System.out.print(j+ " " );
```

```
}
```

```
System.out.println();
```

```
}
```

```
}
```

```
}
```

```
Command Prompt

C:\Users\Vennela.G>javac Series1.java

C:\Users\Vennela.G>java Series1
1
1 2
1 2 3

C:\Users\Vennela.G>
```

ii) \*

\* \*

\* \* \*

\* \*

\*

```
class Series2
{
    public static void main(String arg[])
    {
        for(int i=1;i<4;i++)
```



```
{for(int j=4;j>=i;j--)  
{System.out.print(" ");  
}  
for(int j=1;j<=i;j++)  
{System.out.print("* ");  
}  
System.out.println();  
}  
for (int i = 1; i <3; i++)  
    {for (int j = 0; j <=i; j++)  
        {System.out.print(" ");  
        }  
    for (int j = i; j <3; j++)  
        {System.out.print(" *");  
        }  
    System.out.println();  
}  
}  
}
```

```
Command Prompt
* *
*

C:\Users\Vennela.G>javac Series2.java

C:\Users\Vennela.G>java Series2
*
* *
* * *
* *
*

C:\Users\Vennela.G>
```

## 6. Write a program to generate the Fibonacci series.

```
import java.util.Scanner;
```

```
class Fib
```

```
{
```

```
public static void main(String arg[])
```

```
{Scanner sc=new Scanner(System.in);
```

```
int arr[]=new int[50];
```

```
arr[0]=0;
```

```
arr[1]=1;
```

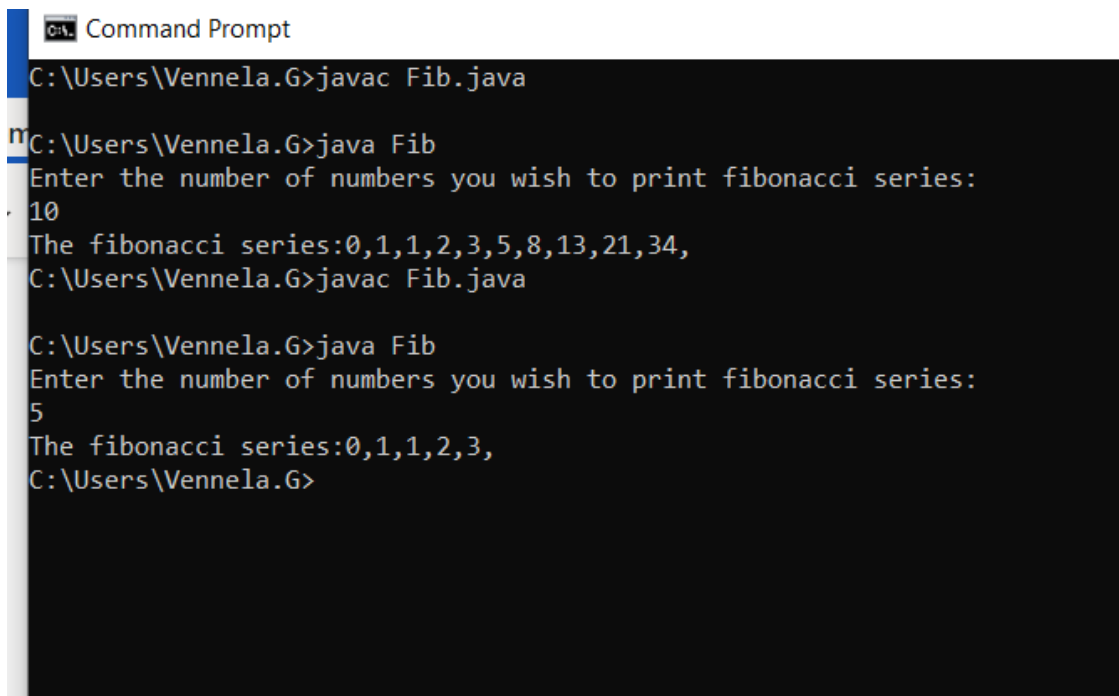
```
System.out.println("Enter the number of numbers you wish to print fibonacci series:");
```

```
int a=sc.nextInt();
```

```

System.out.print("The fibonacci series:0,1,");
for(int i=2;i<a;i++)
{
arr[i]=arr[i-1]+arr[i-2];
System.out.print(arr[i]+",");
}
}
}

```



```

C:\Users\Vennela.G>javac Fib.java

C:\Users\Vennela.G>java Fib
Enter the number of numbers you wish to print fibonacci series:
10
The fibonacci series:0,1,1,2,3,5,8,13,21,34,
C:\Users\Vennela.G>javac Fib.java

C:\Users\Vennela.G>java Fib
Enter the number of numbers you wish to print fibonacci series:
5
The fibonacci series:0,1,1,2,3,
C:\Users\Vennela.G>

```

## 7. Write a program to sort n numbers in ascending order.

```
import java.util.Scanner;
```

```
class sort
```

```

{
public static void main(String arg[])
{ Scanner sc=new Scanner(System.in);
    System.out.println("Enter count of numbers to sort:");
int n=sc.nextInt();
int arr[]=new int[n];
Scanner sc1=new Scanner(System.in);
System.out.println("Enter the numbers:");
for(int i=0;i<n;i++)
{arr[i]=sc1.nextInt();
}
int temp=0;
for(int i=0;i<n;i++)
{for(int j=i+1;j<n;j++)
    {if(arr[i] > arr[j])
        {temp = arr[i];
        arr[i] = arr[j];
        arr[j] = temp; }}}
System.out.println("The sorted order of numbers:");
for(int i=0;i<n;i++)
{System.out.print(arr[i]+" ");
}
}
}
}

```

```
Select Command Prompt
C:\Users\Vennela.G>javac sort.java
C:\Users\Vennela.G>java sort
Enter count of numbers to sort:
5
Enter the numbers:
4
1
5
3
7
The sorted order of numbers:
1 3 4 5 7
C:\Users\Vennela.G>
```

## 8. Write a program to search a number among n numbers using binary search.

```
import java.util.Scanner;
```

```
class binarysearch
```

```
{
```

```
static int bsearch(int arr[], int start, int end, int ser)
```

```
{
```

```
    if (end >= start)
```

```
        {int mid = start+(end-start) /2;
```

```
        if(arr[mid] == ser)
```

```
            { return mid;}
```

```
        if (arr[mid] > ser)
```

```

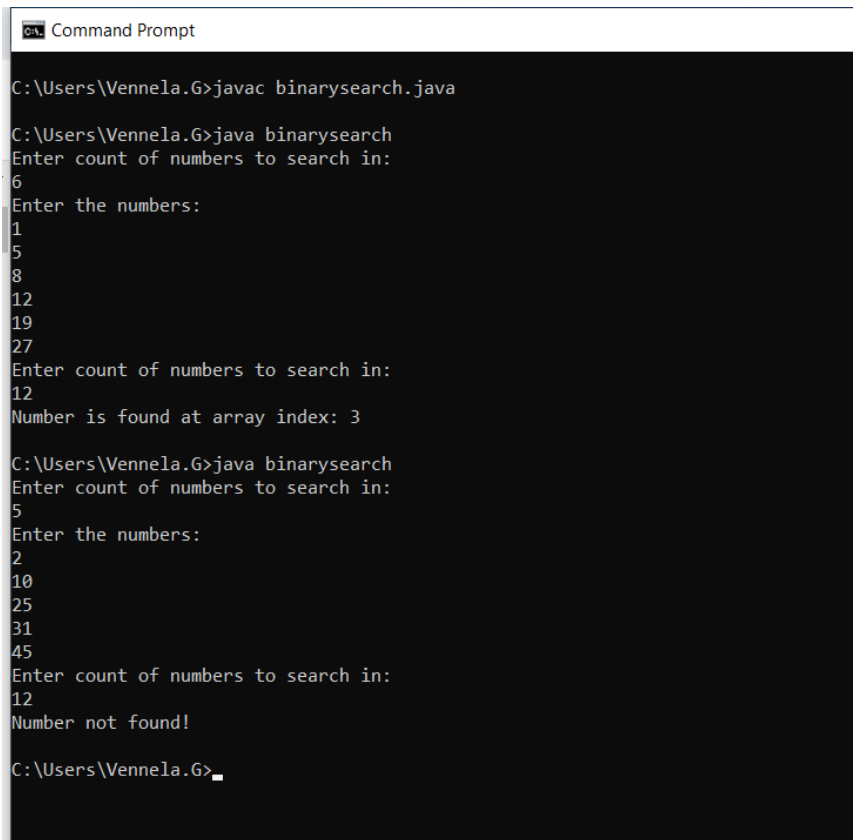
        {return bsearch(arr,start, mid - 1, ser);}
    else
        {return bsearch(arr, mid + 1,end,ser);}

    }
return -1;
}

public static void main(String arg[])
{ Scanner sc=new Scanner(System.in);
    System.out.println("Enter count of numbers to search in:");
    int n=sc.nextInt();
    int arr[]=new int[n];
    Scanner sc1=new Scanner(System.in);
    System.out.println("Enter the numbers:");
    for(int i=0;i<n;i++)
    {arr[i]=sc1.nextInt();
    }
    Scanner sc2=new Scanner(System.in);
    System.out.println("Enter count of numbers to search in:");
    int num=sc2.nextInt();
    int res=bsearch(arr,0,n-1,num);
    if(res==-1)
    {System.out.println("Number not found!");}
    else

```

```
{System.out.println("Number is found at array index: "+ res);  
}  
}
```



```
Command Prompt  
C:\Users\Vennela.G>javac binarysearch.java  
C:\Users\Vennela.G>java binarysearch  
Enter count of numbers to search in:  
6  
Enter the numbers:  
1  
5  
8  
12  
19  
27  
Enter count of numbers to search in:  
12  
Number is found at array index: 3  
C:\Users\Vennela.G>java binarysearch  
Enter count of numbers to search in:  
5  
Enter the numbers:  
2  
10  
25  
31  
45  
Enter count of numbers to search in:  
12  
Number not found!  
C:\Users\Vennela.G>
```

## 9. Write a program to read 'n' numbers and print their sum and average.

```
import java.util.Scanner;
```

```
class sumavg
```

```
{
```

```
public static void main(String arg[])
```

```
{int arr[]=new int[20];
```

```
int sum=0;
Scanner sc=new Scanner(System.in);
System.out.println("Enter count of numbers:");
int n=sc.nextInt();
Scanner sc1=new Scanner(System.in);
System.out.println("Enter numbers:");
for(int i=0;i<n;i++)
{ arr[i]=sc.nextInt();
}
for(int i=0;i<n;i++)
{sum=sum+arr[i];
}
System.out.println("The sum of numbers:"+sum);
System.out.println("The average of numbers:"+sum/n);
}}
```



```
Command Prompt

C:\Users\Vennela.G>javac sumavg.java

C:\Users\Vennela.G>java sumavg
Enter count of numbers:
5
Enter numbers:
10
20
30
40
50
The sum of numbers:150
The average of numbers:30

C:\Users\Vennela.G>
```

**10. Write a program that accepts a number as input and convert them into binary, octal and hexadecimal equivalents.**

```
import java.util.Scanner;
```

```
class equiv
```

```
{
```

```
public static void main(String arg[])
```

```
{int a,b;
```

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

```
System.out.println("Enter the number:");
```

```
int num=sc.nextInt();
```

```
a=num;b=num;
```

```
int bin[] = new int[20];
int count = 0;
while(a > 0){
    bin[count++] =a%2;
    a= a/2;
}
System.out.print("The binary equivalent is:");
for(int i = count-1;i >= 0;i--){
    System.out.print(bin[i]);
}
System.out.println();
```

```
int remain;
String oct="";
char octequi[]={'0','1','2','3','4','5','6','7'};
while(b>0)
{
    remain=b%8;
    oct=octequi[remain]+oct;
    b=b/8;
}
System.out.println("The octal equivalent is:"+ oct);
int remain1;
String hex="";
```

```

char hexequi[]={ '0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'};
while(num>0)
{
    remain1=num%16;
    hex=hexequi[remain1]+hex;
    num=num/16;
}
System.out.println("The octal equivalent is:"+ hex);
}}

```

```

C:\Users\Vennela.G>javac equiv.java

C:\Users\Vennela.G>java equiv
Enter the number:
5
The binary equivalent is:101
The octal equivalent is:5
The octal equivalent is:5

C:\Users\Vennela.G>java equiv
Enter the number:
50
The binary equivalent is:110010
The octal equivalent is:62
The octal equivalent is:32

C:\Users\Vennela.G>_

```

**11. Write a menu driven program to i) append a string ii) insert a string iii) delete a portion of the string.**

```
import java.util.Scanner;
```

```

class stringop
{
    public static void main(String arg[])
    {StringBuffer s = new StringBuffer();
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the string:");
    s.append(sc.nextLine());
    Scanner sc1=new Scanner(System.in);
    System.out.println("Enter the number 1-To append 2-To Insert string 3-To delete
    portion of string:");
    int ch=sc1.nextInt();
    switch(ch)
    { case 1:
    StringBuffer s1 = new StringBuffer();
    Scanner sc2=new Scanner(System.in);
    System.out.println("Enter the string to append:");
    s1.append(sc2.nextLine());
    System.out.println("The appended string is:"+s.append(s1));
    break;

    case 2:
    StringBuffer s2 = new StringBuffer();
    Scanner sc3=new Scanner(System.in);
    System.out.println("Enter the string to insert:");
    s2.append(sc3.nextLine());

```

```
System.out.println("Enter the value at which you want to insert:");  
int index=sc3.nextInt();  
System.out.println("The string after inserting is:"+s.insert(index,s2));  
break;
```

case 3:

```
Scanner sc4=new Scanner(System.in);  
System.out.println("Enter the start index from which you want to delete:");  
int sid=sc4.nextInt();  
System.out.println("Enter the end index until which you want to delete:");  
int eid=sc4.nextInt();  
System.out.println("The string after deleting is:"+s.delete(sid,eid));  
}  
}  
}
```

Command Prompt

```
C:\Users\Vennela.G>javac stringop.java

C:\Users\Vennela.G>java stringop
Enter the string:
hello
Enter the number 1-To append 2-To Insert string 3-To delete portion of string:
1
Enter the string to append:
welcome
The appended string is:helloworldwelcome

C:\Users\Vennela.G>java stringop
Enter the string:
morning
Enter the number 1-To append 2-To Insert string 3-To delete portion of string:
2
Enter the string to insert:
noon
Enter the value at which you want to insert:
3
The string after inserting is:mornoonning

C:\Users\Vennela.G>java stringop
Enter the string:
friend
Enter the number 1-To append 2-To Insert string 3-To delete portion of string:
3
Enter the start index from which you want to delete:
2
Enter the end index until which you want to delete:
5
The string after deleting is:frd

C:\Users\Vennela.G>_
```

## 12. Write a program to check whether a string is palindrome or not without using functions.

```
import java.util.Scanner;
```

```
class palin
```

```
{
```

```
public static void main(String arg[])
```


```
{String s1="";
```

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

```

System.out.println("Enter the string to check palindrome or not:");
String s=sc.nextLine();
int n=s.length();
for(int i = n-1; i>= 0; i--)
    {s1 =s1+s.charAt(i);}
if(s.equals(s1))
{System.out.println("The string is palindrome");}
else
{System.out.println("The string is not palindrome");}
}
}

```

 Command Prompt

```

C:\Users\Vennela.G>javac palin.java

C:\Users\Vennela.G>java palin
Enter the string to check palindrome or not:
madam
The string is palindrome

C:\Users\Vennela.G>java palin
Enter the string to check palindrome or not:
apple
The string is not palindrome

C:\Users\Vennela.G>_

```

**13. Write a menu driven program to i) compare two strings ii) get the character in the specified position iii) extract a substring iv) replace a character with the given character v) get the position of a specified substring/character.**

```

import java.util.Scanner;

class stringop1
{
    public static void main(String arg[])
    {Scanner sc=new Scanner(System.in);
    System.out.println("Enter the string:");
    String s=sc.nextLine();
    Scanner sc1=new Scanner(System.in);

    System.out.println("Enter the number 1-To compare two strings 2-To get
    character in specified position 3-To extract a substring 4. To replace character
    5.To get position of substring/character:");
    int ch=sc1.nextInt();
    switch(ch)
    { case 1:
    Scanner sc2=new Scanner(System.in);
    System.out.println("Enter the string to compare:");
    String s1=sc2.nextLine();
    System.out.println("The string when compared gives:"+s.compareTo(s1));
    break;

    case 2:
    Scanner sc3=new Scanner(System.in);
    System.out.println("Enter the index at the place where you want to get
    character:");

```



```
int index=sc3.nextInt();  
System.out.println("The character is:"+s.charAt(index));  
break;
```

case 3:

```
Scanner sc4=new Scanner(System.in);  
System.out.println("Enter the start index from which you want to extract:");  
int sid=sc4.nextInt();  
System.out.println("Enter the end index until which you want to extract:");  
int eid=sc4.nextInt();  
System.out.println("The string is:" + s.substring(sid,eid));  
break;
```

case 4:

```
Scanner sc5=new Scanner(System.in);  
System.out.println("Enter the character you which to replace:");  
char c=sc5.next().charAt(0);  
System.out.println("Enter the character with which you want to replace:");  
char c1=sc5.next().charAt(0);  
System.out.println("The string after replacing is:"+s.replace(c,c1));  
break;
```

case 5:

```
Scanner sc6=new Scanner(System.in);
```

```
System.out.println("Enter the character/substring for which you want to obtain  
index:");
```

```
String s2=sc6.nextLine();
```

```
System.out.println("The position of is:"+s.indexOf(s2));
```

```
break;
```

```
}
```

```
}
```

```
}
```

```

Command Prompt

C:\Users\Vennela.G>java stringop1
Enter the string:
Hello
Enter the number 1-To compare two strings 2-To get character in specified position 3-To extract a substring 4. To replace character 5.To get position of substring/character:
1
Enter the string to compare:
Good
The string when compared gives:1

C:\Users\Vennela.G>java stringop1
Enter the string:
Morning
Enter the number 1-To compare two strings 2-To get character in specified position 3-To extract a substring 4. To replace character 5.To get position of substring/character:
2
Enter the index at the place where you want to get character:
3
The character is:n

C:\Users\Vennela.G>java stringop1
Enter the string:
Welcomeworld
Enter the number 1-To compare two strings 2-To get character in specified position 3-To extract a substring 4. To replace character 5.To get position of substring/character:
3
Enter the start index from which you want to extract:
2
Enter the end index until which you want to extract:
5
The string is:lco

C:\Users\Vennela.G>java stringop1
Enter the string:
Helloworld
Enter the number 1-To compare two strings 2-To get character in specified position 3-To extract a substring 4. To replace character 5.To get position of substring/character:
4
Enter the character you which to replace:
o
Enter the character with which you want to replace:
e
The string after replacing is:Helleworld

C:\Users\Vennela.G>java stringop1
Enter the string:
HiHello
Enter the number 1-To compare two strings 2-To get character in specified position 3-To extract a substring 4. To replace character 5.To get position of substring/character:
5
Enter the character/substring for which you want to obtain index:
e
The position of is:4

```

## 14. Write a program to change the case of the letters in a string. Eg. ABCdef abcDEF

```
import java.util.Scanner;
```

```
class casech
```

```
{
```

```
public static void main(String arg[])
```

```
{String newstr="";
```

```
Scanner sc=new Scanner(System.in);
System.out.println("Enter the string to change case:");
String s=sc.nextLine();
for(int i=0;i<s.length();i++)
{
    if(Character.isLowerCase(s.charAt(i)))
    {newstr=newstr+Character.toUpperCase(s.charAt(i));
    }
    else
    {newstr=newstr+Character.toLowerCase(s.charAt(i));
    }
}
System.out.println("The modified string is:"+ newstr);
}
}
```

```
Command Prompt

C:\Users\Vennela.G>javac casech.java

C:\Users\Vennela.G>java casech
Enter the string to change case:
ABCdef
The modified string is:abcDEF

C:\Users\Vennela.G>java casech
Enter the string to change case:
VeNnElA
The modified string is:vEnNeLa

C:\Users\Vennela.G>
```

**15. Write a class with the following methods:**

**wordCount:** This method accepts a String object as an argument and returns the number of words contained in the object.

**arrayToString:** This method accepts a char array as an argument and converts it to a String object.

**mostFrequent:** This method accepts a String object as an argument and returns the character that occurs the most frequently in the object.

```
import java.util.Scanner;
```

```
class methods
```

```

{public static void main(String arg[])
{
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter string:");
    String s=sc.nextLine();
    char[] temp = new char[s.length()];
    for (int i = 0; i < s.length(); i++) {
        temp[i] = s.charAt(i);
    }
    System.out.println ("\nThe number of words is: " + wordCount(s));
    System.out.println("\nCharacter array to String: " + arrayToString(temp));
    System.out.println("\nThe most frequent character is: " + mostFrequent(s));
}

```

```

public static int wordCount(String s1)
{
    int wordnum= 0;
    boolean blank_space = true;
    for (int i = 0; i < s1.length(); i++)
    {
        if (s1.charAt(i) == ' ')
        {
            blank_space=true;
        }
        else
        {
            if(blank_space)
            {
                wordnum++;
            }
            blank_space = false;
        }
    }
}

```

```
return wordnum;  
}
```

```
public static String arrayToString(char[] charray)  
{StringBuffer strbuf = new StringBuffer();  
for (int i = 0; i < charray.length; i++)  
{strbuf.append(charray[i]);}  
return strbuf.toString();  
}
```

```
public static Character mostFrequent(String s2)  
{ int count[] = new int[1000];  
  int len = s2.length();  
  for (int i=0; i<len; i++)  
    { count[s2.charAt(i)]++;}  
  int max = -1;  
  char res = ' ';  
  for (int i = 0; i < len; i++) {  
    if (max < count[s2.charAt(i)]) {  
      max = count[s2.charAt(i)];  
      res= s2.charAt(i);}  
  }  
  return res;  
}
```

```
Command Prompt
C:\Users\Vennela.G>javac methods.java

C:\Users\Vennela.G>java methods
Enter string:
welcome buddy

The number of words is: 2

Character array to String: welcome buddy

The most frequent character is: e

C:\Users\Vennela.G>java methods
Enter string:
welcome to world

The number of words is: 3

Character array to String: welcome to world

The most frequent character is: o

C:\Users\Vennela.G>
```

**16. Create a class Student (Regno, Name, Branch, Year, Semester and 5 Marks). Add methods to read the student details, calculate the grade and print the mark statement.**

```
import java.util.Scanner;
```

```
class Student
```

```
{
```

```
public static void main(String arg[])
```

```
{System.out.println("-----STUDENT DETAILS-----");
```

```
String regno=new String();
```

```
String name=new String();
```



```
String branch=new String();  
int marks[]=new int[10];  
read(regno,name,branch,marks);  
System.out.println("Your grade is: "+grade(marks));  
System.out.println();  
mark(marks);  
}
```

```
public static void read(String regno,String name,String branch,int[]marks)  
{  
Scanner sc=new Scanner(System.in);  
System.out.println("Enter student's regno:");  
regno=sc.nextLine();  
System.out.println("Enter student's name:");  
name=sc.nextLine();  
System.out.println("Enter student's branch:");  
branch=sc.nextLine();  
System.out.println("Enter student's current year:");  
int year=sc.nextInt();  
System.out.println("Enter student's current semester:");  
int semester=sc.nextInt();  
Scanner sc1=new Scanner(System.in);  
for(int i=0;i<5;i++)  
{System.out.println("Enter 5 subject marks:");
```

```
marks[i]=sc1.nextInt();}  
}
```

```
public static char grade(int[]marks)  
{  
int sum=0;int avg;  
char ch=' '  
for(int i=0;i<5;i++)  
{  
sum=sum+marks[i];  
}  
avg=sum/5;  
if(avg>=80)  
{ch='A';  
return ch;}  
else if(avg>=60 && avg<80)  
{ch='B';  
return ch;}  
else if(avg>=40 && avg<60)  
{ch='C';  
return ch;}  
else  
{ch='D';  
return ch;}
```

```
}
```

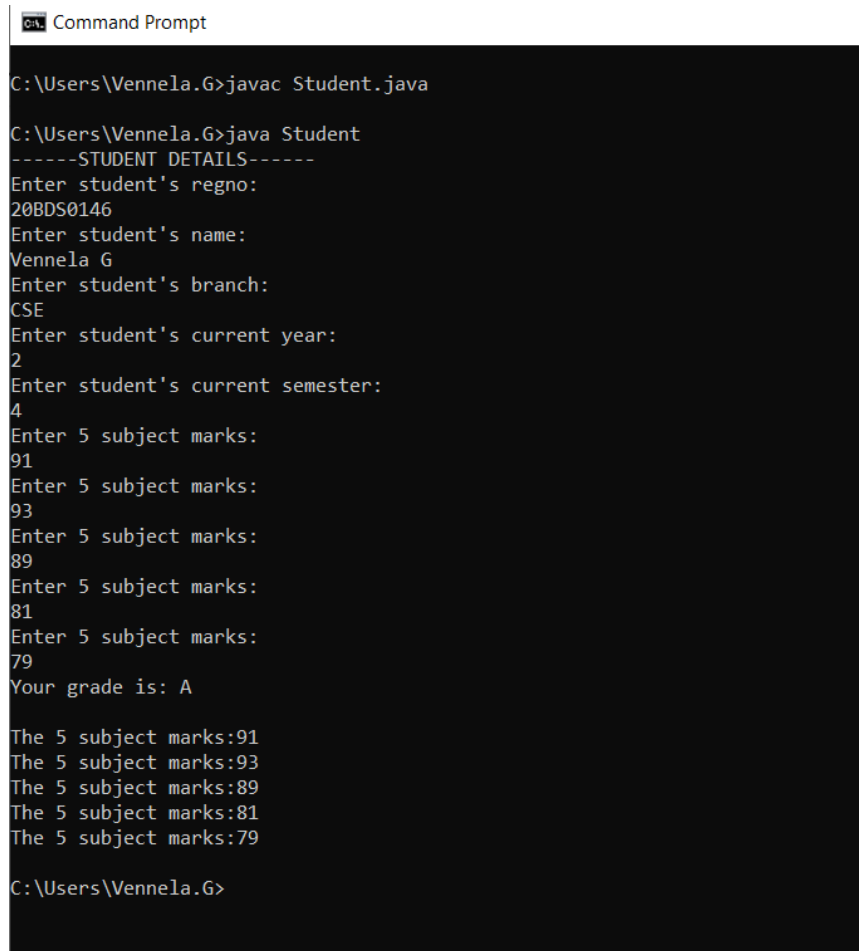
```
public static void mark(int[]marks)
```

```
{for(int i=0;i<5;i++)
```

```
{System.out.println("The 5 subject marks:"+marks[i]);
```

```
}}
```

```
}
```



```
Command Prompt
C:\Users\Vennela.G>javac Student.java
C:\Users\Vennela.G>java Student
-----STUDENT DETAILS-----
Enter student's regno:
20BDS0146
Enter student's name:
Vennela G
Enter student's branch:
CSE
Enter student's current year:
2
Enter student's current semester:
4
Enter 5 subject marks:
91
Enter 5 subject marks:
93
Enter 5 subject marks:
89
Enter 5 subject marks:
81
Enter 5 subject marks:
79
Your grade is: A

The 5 subject marks:91
The 5 subject marks:93
The 5 subject marks:89
The 5 subject marks:81
The 5 subject marks:79

C:\Users\Vennela.G>
```

**17. Write a program that displays an invoice of several items. Create a class called Item with members item\_name, quantity,**

**price and total\_cost and methods to get and set values for the members. Derive a new class to print the bill using Item class.**

```
import java.util.Scanner;
```

```
class Item
```

```
{
```

```
String item_name;
```

```
int quantity;
```

```
int price;
```

```
public void getval()
```

```
{Scanner sc=new Scanner(System.in);
```

```
System.out.println("Enter name of Item: ");
```

```
item_name=sc.nextLine();
```

```
System.out.println("Enter quantity: ");
```

```
quantity=sc.nextInt();
```

```
System.out.println("Enter price: ");
```

```
price=sc.nextInt();
```

```
}
```

```
public void display()
```

```
{
```

```
System.out.println("Item: "+item_name);
```

```
System.out.println("Quantity: "+quantity);  
System.out.println("Price: "+price);  
}  
}
```

```
class Bill extends Item  
{  
    public static void main(String arg[])  
    {  
        int N;int total_cost=0;  
        Scanner sc1=new Scanner(System.in);  
        Item ptr[];  
        ptr = new Item[100];  
        System.out.print("Enter count of items: ");  
        N=sc1.nextInt();  
        for(int i=0;i<N;i++)  
        {  
            ptr[i]=new Item();  
            ptr[i].getval();  
            System.out.println();  
        }  
        for(int i=0;i<N;i++)  
        {  
            ptr[i].display();  
        }  
    }  
}
```

```

System.out.println();
}
for(int i=0;i<N;i++)
{
total_cost=total_cost+ptr[i].price*ptr[i].quantity;
}
System.out.println("\nThe total cost of all items is Rs: "+total_cost );
}
}

```

```

C:\Users\Vennela.G>javac Bill.java

C:\Users\Vennela.G>java Bill
Enter count of items: 5
Enter name of Item:
biscuit
Enter quantity:
10
Enter price:
20

Enter name of Item:
cake
Enter quantity:
15
Enter price:
30

Enter name of Item:
chocolate
Enter quantity:
20
Enter price:
45

Enter name of Item:
muffins
Enter quantity:
10
Enter price:
40

Enter name of Item:
lollipops
Enter quantity:
30
Enter price:
5

Item: biscuit
Quantity: 10
Price: 20

```

```
Command Prompt
Enter name of Item:
muffins
Enter quantity:
10
Enter price:
40

Enter name of Item:
lollipops
Enter quantity:
30
Enter price:
5

Item: biscuit
Quantity: 10
Price: 20

Item: cake
Quantity: 15
Price: 30

Item: chocolate
Quantity: 20
Price: 45

Item: muffins
Quantity: 10
Price: 40

Item: lollipops
Quantity: 30
Price: 5

The total cost of all items is Rs: 2100

C:\Users\Vennela.G>_
```

**18. Create a class Telephone with two members to hold customer's name and phone number. The class should have appropriate constructor, input and display methods. Derive a class TelephoneIndex with methods to change the name or phone number. Create an array of objects and perform the following functions.**

- a. Search for a name when the user enters a name or the first few characters.**
- b. Display all of the names that match the user's input and their corresponding phone numbers.**
- c. Change the name of a customer.**
- d. Change the phone number of a customer.**

```
import java.util.Scanner;

class Telephone
{
    String cust_name;
    int phone_num;
    Telephone()
    {
        cust_name="";
        phone_num=0;
    }
    void getinfo()
    {Scanner sc=new Scanner(System.in);
    System.out.println("Enter name of customer:");
    cust_name=sc.nextLine();
    System.out.println("Enter phone number: ");
    phone_num=sc.nextInt();
    }
    void display()
    {
        System.out.println("Customer name: "+cust_name);
        System.out.println("Phone Number: "+phone_num);
    }
}
```



```
class TelephoneIndex extends Telephone
{
Scanner sc1= new Scanner(System.in);
void changeName()
{
char ch;

System.out.println("Do you want to change your name?Reply y or n");
ch=sc1.next().charAt(0);
sc1.nextLine();
if (ch=='y')
{
System.out.println("Enter new name: ");
cust_name=sc1.nextLine();
}

}
void changeNum()
{
char ch;

System.out.println("Do you want to change your phone number?Reply y or n");
ch=sc1.next().charAt(0);
sc1.nextLine();
if (ch=='y')
{
```

```

System.out.println("Enter new phone number: ");
phone_num=sc1.nextInt();
}
}
void search(String s)
{
if (cust_name.indexOf(s)==0)
{
display();
changeName();
changeNum();
}

}
}
public class teldirectory
{
public static void main(String arg[])
{

Scanner sc2 =new Scanner(System.in);
TelephoneIndex ptr[];
ptr=new TelephoneIndex[10];
System.out.println("Enter count of records: ");

```

```
int N=sc2.nextInt();
for (int i=0;i<N;i++)
{
ptr[i] = new TelephoneIndex();
ptr[i].getinfo();
}
sc2.nextLine();
String str= new String();
System.out.println("Enter the string to search for matching details: ");
str=sc2.nextLine();
for (int i=0; i<N;i++)
{
ptr[i].search(str);
}
System.out.println("The details of customers are:");
for (int i=0;i<N;i++)
{ptr[i].display();}
}
}
```

```

C:\Users\Vennela.G>javac teldirectory.java

C:\Users\Vennela.G>java teldirectory
Enter count of records:
3
Enter name of customer:
Vennela
Enter phone number:
99751
Enter name of customer:
Reena
Enter phone number:
98345
Enter name of customer:
Roy
Enter phone number:
41567
Enter the string to search for matching details:
Vennela
Customer name: Vennela
Phone Number: 99751
Do you want to change your name?Reply y or n
n
Do you want to change your phone number?Reply y or n
y
Enter new phone number:
912663
The details of customers are:
Customer name: Vennela
Phone Number: 912663
Customer name: Reena
Phone Number: 98345
Customer name: Roy
Phone Number: 41567

C:\Users\Vennela.G>

```

**19. Create an abstract class called BankAccount with members customer name, date of birth, address, account number, balance and member functions to get values for the members and display it. Derive a class SavingsAccount with member functions to perform deposit and withdraw in the account. Write a menu driven program to create a new account, perform withdraw, deposit and delete an account.**

```
import java.util.Scanner;
```

```
abstract class BankAccount
```

```
{String cust_name;
```

```
String dateofbirth;
```

```
String address;

int acc_num;

int balance;


void getdetails()
{
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter name of customer: ");
    cust_name=sc.nextLine();
    System.out.println("Enter your date of birth: ");
    dateofbirth=sc.nextLine();
    System.out.println("Enter your address: ");
    address=sc.nextLine();
    System.out.println("Enter your account number: ");
    acc_num=sc.nextInt();
    System.out.println("Enter the balance: ");
    balance=sc.nextInt();
}

void display()
{
    System.out.println("Customer Name: "+cust_name);
    System.out.println("Date of birth: "+dateofbirth);
    System.out.println("Address: "+address);
    System.out.println("Account number: "+acc_num);
    System.out.println("Balance: "+balance);
}
```

```
}  
protected void del()  
{  
System.out.println("Your account is deleted");  
}  
};  
class SavingsAccount extends BankAccount  
{  
void deposit()  
{Scanner sc1=new Scanner(System.in);  
System.out.println("Enter amount to deposit: ");  
int amt=sc1.nextInt();  
balance=balance+amt;  
System.out.println("New balance= "+balance);  
}  
void withdraw()  
{Scanner sc2=new Scanner(System.in);  
System.out.println("Enter the amount to be withdrawn: ");  
int amt=sc2.nextInt();  
balance=balance-amt;  
System.out.println("New balance= "+balance);  
}  
};  
public class Bank
```

```
{  
public static void main(String arg[])  
{  
SavingsAccount ptr[];  
ptr= new SavingsAccount[10];  
char ch;int opt;  
int i=-1,flag=0;  
Scanner sc5= new Scanner(System.in);  
do  
{System.out.println("Enter 1 to create new account 2 to deposit 3 to withdraw 4  
to delete account:");  
opt=sc5.nextInt();  
switch(opt)  
{  
case 1: i++;  
ptr[i]=new SavingsAccount();  
ptr[i].getdetails();  
System.out.println("Your account is created");  
ptr[i].display();  
break;  
case 2: ptr[i].deposit();  
break;  
case 3: ptr[i].withdraw();  
break;  
case 4: ptr[i].del();
```

```
break;
```

```
}
```

```
System.out.println("Do you want to continue?Reply y or n");
```

```
ch=sc5.next().charAt(0);
```

```
} while ((ch=='y' || ch=='Y')&&(i<10));
```

```
}
```

```
}
```

Command Prompt

```
C:\Users\Vennela.G>javac Bank.java

C:\Users\Vennela.G>java Bank
Enter 1 to create new account 2 to deposit 3 to withdraw 4 to delete account:
1
Enter name of customer:
Vennela
Enter your date of birth:
24april2003
Enter your address:
Teachers colony, vellore
Enter your account number:
8765442
Enter the balance:
5000
Your account is created
Customer Name: Vennela
Date of birth: 24april2003
Address: Teachers colony, vellore
Account number: 8765442
Balance: 5000
Do you want to continue?Reply y or n
y
Enter 1 to create new account 2 to deposit 3 to withdraw 4 to delete account:
2
Enter amount to deposit:
2000
New balance= 7000
Do you want to continue?Reply y or n
y
Enter 1 to create new account 2 to deposit 3 to withdraw 4 to delete account:
3
Enter the amount to be withdrawn:
1000
New balance= 6000
Do you want to continue?Reply y or n
y
Enter 1 to create new account 2 to deposit 3 to withdraw 4 to delete account:
4
Your account is deleted
Do you want to continue?Reply y or n
n

C:\Users\Vennela.G>
```

**20. Create an Interface with methods add(), sub(), multiply() and divide(). Write two classes FloatValues to perform**



**arithmetic operations on floating point numbers and IntegerValues on integer numbers by implementing the interface.**

```
interface operations
```

```
{  
    public float add();  
    public float sub();  
    public float multiply();  
    public float divide();  
}
```

```
class FloatValues
```

```
{float num1,num2,a,s,m,d;  
    FloatValues(float num1,float num2)  
    {this.num1=num1;  
    this.num2=num2;}
```

```
    public float add()  
    {a=num1+num2;  
    return a;  
    }
```


```
    public float sub()  
    {s=num1-num2;  
    return s;
```

```
}  
public float multiply()  
{m=num1*num2;  
return m;  
}  
public float divide()  
{d=num1/num2;  
return d;  
}  
}  
class IntegerValues  
{int num3,num4;  
float a,s,m,d;  
IntegerValues(int num3,int num4)  
{this.num3=num3;  
this.num4=num4;}  
  
public float add()  
{a=num3+num4;  
return a;  
}  
public float sub()  
{s=num3-num4;  
return s;
```

```
}  
public float multiply()  
{m=num3*num4;  
return m;  
}  
public float divide()  
{d=num3/num4;  
return d;  
}  
}
```

```
class apfloatop  
{  
public static void main(String arg[])  
{  
FloatValues f= new FloatValues(10.5f,2.5f);  
System.out.println("The float values addition result: "+f.add());  
System.out.println("The float values subtraction result: "+f.sub());  
System.out.println("The float values multiplication result: "+f.multiply());  
System.out.println("The float values division result: "+f.divide());  
IntegerValues i= new IntegerValues(10,2);  
System.out.println("The integer values addition result: "+i.add());  
System.out.println("The integer values subtraction result: "+i.sub());  
System.out.println("The integer values multiplication result: "+i.multiply());
```

```
System.out.println("The integer values division result: "+i.divide());  
}  
}
```

 Command Prompt

```
C:\Users\Vennela.G>javac apfloatop.java  
  
C:\Users\Vennela.G>java apfloatop  
The float values addition result: 13.0  
The float values subtraction result: 8.0  
The float values multiplication result: 26.25  
The float values division result: 4.2  
The integer values addition result: 12.0  
The integer values subtraction result: 8.0  
The integer values multiplication result: 20.0  
The integer values division result: 5.0  
  
C:\Users\Vennela.G>
```