

2. #include <stdio.h>

float sumaver (int x, int y)

{

printf ("Sum = %.d\n", (x+y));

return ((x+y)/2.0);

}

void printeven (int n, int y)

{

printf ("All the even numbers from %.d to %.d\n",
y, n);

if (y%2 == 0)

y+=1;

for (int i=y; i<=n; i+=2)

printf ("%.d", i);

y

int main()

{

int a[3], g1, g2, t;

printf ("Enter 3 nos.\n");

scanf ("%.d %.d %.d", &a[0], &a[1], &a[2]);

for (int i=0; i<3; i++)

{

for (int j=i+1; j<3; j++)

if ($a[i] < a[j]$)

$t = a[i];$

$a[i] = a[j];$

$a[j] = t;$

y

y

y

$g_1 = a[0];$

$g_2 = a[1];$

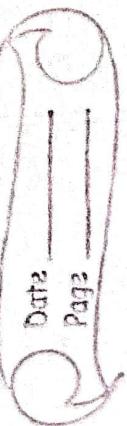
float ans = sumarr(g1, g2);

printf("sumarr = %.f \n", ans);

printarr(g1, g2);

return 0;

y



15/9/2020

OOJ LAB.

LAB - 1

1) #include <stdio.h> #include <math.h>
int main()

{

 int ch=12, a, b;

 printf("Enter the 2 nos.\n");

 scanf("%d%d", &a, &b);

 while (c!=0)

{

 printf("Enter the suitable choice\n");

 printf(" 1 - Addition \n 2 - Subtraction \n 3 - Multiplication \n

 4 - Division \n 5 - Greatest of 2 \n 6 - Smallest of 2 \n 7 - If

 Equality \n 8 - not equal \n 9 - Modulus \n 10 - Power \n ");

 scanf("%d", &ch);

 switch (c)

{

 Case 1:

 printf("%d", (a+b));
 break; }

 Case 2:

 printf("%d", (a-b));
 break; }

 Case 3:

 printf("%d", (a*b));
 break; }

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case 4:

```
L printf("%d", (a>b));  
break; }
```

Case 5:

```
L if (a>b)  
    printf("%d", a);  
else  
    printf("%d", b);  
break;  
}
```

Case 6:

```
L  
if (a < b)  
    printf("%d", a);  
else  
    printf("%d", b);  
break;  
}
```

case 7:

```
L if (a == b)  
    printf("Numbers are equal\n");  
break; }
```

Case 8:

L

if ($a != b$)

printf ("Numbers aren't equal");

break;

3

Case 9:

L

if printf ("%d", (a + b));

break; 3

Case 10:

L printf ("%f", pow(a, b));

break; 3

Case

default: printf ("Wrong choice");

3

4

5

```
Program 1 : 15-09-2020
#include<stdio.h>
#include<math.h>
void main()
{
    int a,b,ch=12;
    printf("enter the first number\n");
    scanf("%d",&a);
    printf("enter the second number\n");
    scanf("%d",&b);
    while(ch!=0)
    {
        printf("\nenter the choice\n");
        printf("1-Addition \n 2-Subtraction \n 3-Multiplication \n 4-Division\n5-Greatest of 2 \n 6-Smallest
of 2 \n 7- Equality \n 8-not equal \n 9-Modulus \n 10-Power\n");
        scanf("%d",&ch);
        switch(ch)
        {
            case 1: ;
            {
                printf("%d", (a+b));
                break;
            }
            case 2: ;
            {
                printf("%d", (a-b));
                break;
            }
            case 3: ;
            {
                printf("%d", (a*b));
                break;
            }
            case 4: ;
            {
                printf("%d", (a/b));
                break;
            }
            case 5: ;
            {
                if(a>b)
                    printf("%d",a);
                else
                    printf("%d",b);
                break;
            }
            case 6: ;
            {
                if(a<b)
                    printf("%d",a);
                else
                    printf("%d",b);
                break;
            }
            case 7: ;
            {
                if(a==b)
```

```

        printf("numbers are equal\n");
        break;
    }
case 8:
{
    if(a!=b)
        printf("numbers are not equal\n");
    break;
}
case 9: ;
{
    printf("%d", (a%b));
    break;
}
case 10: ;
{
    printf("%f", pow(a,b));
    break;
}

default :
    printf("Wrong choice\n");
}
}
}

```

OUTPUT:

```

enter the first number
6
enter the second number
9

enter the choice
1-Addition
2-Subtraction
3-Multiplication
4-Division
5-Greatest of 2
6-Smallest of 2
7- Equality
8-not equal
9-Modulus
10-Power
3
54
enter the choice
1-Addition
2-Subtraction
3-Multiplication
4-Division
5-Greatest of 2
6-Smallest of 2
7- Equality
8-not equal
9-Modulus
10-Power
6
6

```

```
1-Addition
2-Subtraction
3-Multiplication
4-Division
5-Greatest of 2
6-Smallest of 2
7- Equality
8-not equal
9-Modulus
10-Power
10
10077696.000000
enter the choice
1-Addition
2-Subtraction
3-Multiplication
4-Division
5-Greatest of 2
6-Smallest of 2
7- Equality
8-not equal
9-Modulus
10-Power
11
Wrong choice

enter the choice
1-Addition
2-Subtraction
3-Multiplication
4-Division
5-Greatest of 2
6-Smallest of 2
7- Equality
8-not equal
9-Modulus
10-Power
0
Wrong choice
```

```

Program 2 - 15 September 2020
#include <stdio.h>
float sumaver(int x,int y)
{
    printf("Sum: %d\n",x+y);
    return((x+y)/2.0);
}

void printeven(int x,int y)
{
    printf("All the even numbers from %d to %d\n",y,x);
    if(y%2 != 0)
        y=y+1;
    for(int i=y;i<=x;i+=2)
        printf("%d ",i);
}

int main()
{
    int a[3],g1,g2,t;
    printf("Enter the three numbers\n");
    scanf("%d%d%d",&a[0],&a[1],&a[2]);
    for(int i=0;i<3;i++)
    {
        for(int j=i+1;j<3;j++)
        {
            if(a[i]<a[j])
            {
                t=a[i];
                a[i]=a[j];
                a[j]=t;
            }
        }
    }

    g1=a[0];
    g2=a[1];
    float aver=sumaver(g1,g2);
    printf("Average: %f\n",aver);
    printeven(g1,g2);
    return 0;
}

```

```
Enter the three numbers
8 7 35
Sum: 43
Average: 21.500000
All the even numbers from 8 to 35
8 10 12 14 16 18 20 22 24 26 28 30 32 34

...Program finished with exit code 0
Press ENTER to exit console.□
```

OUTPUT

6) import java.util.*;
class cones

{

public static void main(String args[])

{

Scanner ob = new Scanner(System.in);

int r, h, ch; int r, h, ch, ct = 1;

double A, V, pi = 3.14159;

while (ct != 0)

{

System.out.println("Enter the values of
radius and height of the cone 3D shape
you want to find the Area and Volume");

r = ob.nextInt();

h = ob.nextInt();

System.out.println("Enter your choice");

System.out.println("1. Cylinder");

System.out.println("2. Cone");

System.out.println("3. Sphere");

ch = ob.nextInt();

switch (ch)

{

case 1:

{

$$A = 2\pi r h + 2\pi r^2$$

$$V = \pi r^2 h$$

System.out.println("Area of Cylinder = "+A+"
sq. unit");

System.out.println("Volume : "+V+" cubic units");

break;

y

case 2:

f

$$A = \pi * r * (r + \sqrt{h^2 + r^2});$$

$$V = (\pi * r * r * h) / 3.0;$$

System.out.println("Area of Cone : "+A+" sq. unit");

System.out.println("Volume : "+V+" cubic units");

break;

y

case 3:

o

$$A = 4 * \pi * r * r; V = (4 * \pi * r * r * r) / 3.0;$$

System.out.println("Area of Sphere : "+A+" sq. unit");

System.out.println("Volume : "+V+" cubic units");

break;

y

default: System.out.println("Wrong choice !!");

y

System.out.println("Please enter any number
to find more values of different shapes")

and do terminate enter "0");

ct = qb.nextInt();

y

4

y

4. #include <stdio.h>
struct student

{

 int CIE, SEE;
 char grade;
 }s[5];

int main()

{

 int i;

 float tot;

 printf("Enter marks of student for 5 subjects\n");
 for (i = 0; i < 5; i++)

{

 printf("Enter the CIE (50) and SEE (100) marks
 of the student separately for subject %d\n", (i + 1));
 scanf("%d %d", &s[i].CIE, &s[i].SEE);

 tot = (s[i].SEE / 2.0) + s[i].CIE;

 if (s[i].CIE >= 20 && s[i].SEE >= 40)

}

 if (tot > 89 && tot <= 100)

 s[i].grade = 'S';

 else if (tot > 79 && tot <= 89)

 s[i].grade = 'A';

 else if (tot > 69 && tot <= 79)

 s[i].grade = 'B';

else if (tot > 59 and tot <= 69)

s[i].grade = 'C';

else if (tot > 49 and tot <= 59)

s[i].grade = 'D';

else

s[i].grade = 'E';

4

else if (s[i].IDE >= 20 and s[i].SEE < 40)

s[i].grade = 'F';

else

s[i].grade = 'N';

4

printf (" Grades : (%N indicates NOT Eligible to
write SEE) \n"),

for (i = 0; i < 5; i++)

printf (" Subject %d : %c \n", (i+1), s[i].grade);

4

7) #include <stdio.h>

#include <string.h>

struct Student

{

char name[20];

int choice;

} s[10];

Void main()

{

int i, n, c1=0, c2=0, c3=0, c4=0;

printf("Enter no. of students: \n");

scanf("%d", &n);

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

{

printf("Enter name: \n");

scanf("%s", &s[i].name);

printf("Select your preferred choice: \n");

printf("1-IOT |t 2- Advanced Java |t 3-J2EE |t

4- Advanced DS \n");

scanf("%d", &s[i].choice);

}

printf("\n\n");

```
printf("Students enrolled in IOT : \n");
```

```
for (i=0; i<n; i++)
```

{

```
if (s[i].choice == 1)
```

{

```
printf("%s \n", s[i].name);
```

```
c1++; }
```

}

```
printf("No. of students enrolled in electric IOT : \n");
    %d \n", c1);
```

```
if (c1 < 3)
```

{

```
printf("This course will not be streamed as
total count is less than 3 \n");
```

```
for (i=0; i<n; i++)
```

{

```
if (s[i].choice == 1)
```

{

```
printf("Please select other electives: \n");
```

```
printf("choose available electives \n"),
```

```
scanf("%d", &s[i].choice); }
```

}

}

```
printf("Students enrolled in Advanced Java:"),
for (i=0; i<n; i++)
{
    if (s[i].choice == 2)
        printf("%s\n", s[i].name);
    c2++;
}
```

y

```
printf("No. of students enrolled in electives:
Advanced Java : %d\n", c2);
```

```
if (c2 < 3)
```

x

```
printf("This course will not be streamed as total
count is less than 3\n");
```

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

```

```
    if (s[i].choice == 2)

```

```
        printf("Please select other electives: (%n)");

```

```
        printf("choose available electives (%n)");

```

```
        scanf("%1.d", &s[i].choice);
}
```

y

y

```
printf ("Students enrolled in J2EE=%d\n");  
for (i=0; i<n; i++)
```

{

```
if (s[i].choice == 3)
```

```
{ printf ("%s\n", s[i].name);  
c3++; }
```

}

```
printf ("No. of students enrolled in electric:  
J2EE = %d\n", c3);
```

```
if (c3 < 3)
```

R

```
printf ("This course will not be streamed as  
total count is less than 3\n");
```

```
for (i=0; i<n; i++)
```

{

```
if (s[i].choice == 3)
```

```
{ printf ("Please select other choices :\n");
```

```
printf ("Choose available choices :\n");
```

```
scanf ("%d", &s[i].choice); }
```

{ }

```
printf("Students enrolled in Advanced DS\n");  
for (i = 0; i < n; i++)
```

{

```
if (s[i].choice == 4)
```

```
{ printf("%s\n", s[i].name);  
c4++; }
```

}

```
printf("No. of students enrolled in elective:
```

```
Advanced DS: %d\n", c4);
```

```
if (c4 < 3)
```

{

```
printf("This course shall not be streamed  
total count is less than 3\n");
```

```
for (i = 0; i < n; i++)
```

{

```
if (s[i].choice == 4)
```

{

```
printf("Please select other electives:\n");
```

```
printf("Choose available electives\n");
```

```
scanf("%d", &s[i].choice); }
```

}

y

y

22/9/2020.

Java - lab 2.

3)- import java.util.*;
class pattern

{

public static void main(String args[])

{

Scanner ob = new Scanner(System.in);

int i, j, n; k = 1;

System.out.println("Enter a number n");

n = ob.nextInt();

for (i=1; i<=n; i++)

{

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

{

System.out.print(k + " ");

k++;

}

System.out.println();

}

}

}

5). #include <stdio.h> #include <math.h>

int main()

{

int m, n, i, j, c = 0;

printf("Enter 2 numbers, first one less than
second one \n");

scanf("%d %d", &m, &n); // prime numbers between m and n
for (i = m; i <= n; i++)

{

for (j = 2; j <= sqrt(i); j++)

{

if (i % j == 0)

{

c = 1;

break;

}

if (c == 0)

printf("%d \n", i);

c = 0;

}

3

Program-4: 3D shapes- Area and volume

```
import java.util.*;
class conics
{
    public static void main(String args[])
    {
        Scanner ob = new Scanner(System.in);
        int r,h,ch,ct=1;
        double A,V,pi=3.14159;
        while(ct!=0)
        {
            System.out.println("Enter the values of radius and height of the 3D shape
you want to find the Area and Volume");
            r = ob.nextInt();
            h = ob.nextInt();
            System.out.println("Enter your choice");
            System.out.println("1. Cylinder");
            System.out.println("2. Cone");
            System.out.println("3. Sphere");
            ch = ob.nextInt();

            switch(ch)
            {
                case 1:
                {
                    A = 2*pi*r*h + 2*pi*r*r;
                    V = pi*r*r*h;
                    System.out.println("Area of the cylinder: "+A+" sq.unit");
                    System.out.println("Volume: "+V+" cubic unit");
                    break;
                }
                case 2:
                {
                    A = pi*r*(r + Math.sqrt(h*h + r*r));
                    V = (pi*r*r*h)/3.0;
                    System.out.println("Area of Cone: "+A+" sq.unit");
                    System.out.println("Volume: "+V+" cubic unit");
                    break;
                }
                case 3:
                {
                    A = 4*pi*r*r;
                    V = (4*pi*r*r*r)/3.0;
                    System.out.println("Area of Sphere: "+A+" sq.unit");
                    System.out.println("Volume: "+V+" cubic unit");
                    break;
                }
                default: System.out.println("Wrong choice!!");
            }
            System.out.println("Please enter any number to find values of other shapes,
to terminate enter zero 0");
            ct = ob.nextInt();
        }
    }
}
```

OUTPUT:

```
(base) Kirans-MacBook-Air:~ Kiranmk$ ./sr/foolers_2... 0000gn/1/geany_1un_001pt_r0nR0.sh ; exit;
Enter the values of radius and height of the 3D shape you want to find the Area and Volume
10
10
Enter your choice
1. Cylinder
2. Cone
3. Sphere
3
Area of Sphere: 1256.636 sq.unit
Volume: 4188.786666666667 cubic unit
Please enter any number to find values of other shapes, to terminate enter zero 0
1
Enter the values of radius and height of the 3D shape you want to find the Area and Volume
10
10
Enter your choice
1. Cylinder
2. Cone
3. Sphere
2
Area of Cone: 758.4469185415692 sq.unit
Volume: 1047.1966666666667 cubic unit
Please enter any number to find values of other shapes, to terminate enter zero 0
4
Enter the values of radius and height of the 3D shape you want to find the Area and Volume
10
10
Enter your choice
1. Cylinder
2. Cone
3. Sphere
1
Area of the cylinder: 1256.636 sq.unit
Volume: 3141.59 cubic unit
Please enter any number to find values of other shapes, to terminate enter zero 0
0

(program exited with code: 0)
Press return to continue
```

Program 7: Electives

```
#include <stdio.h>
#include <string.h>
struct Student
{
    char name[20];
    int choice;
}s[10];

void main()
{
    int i, n, c1 = 0, c2 = 0, c3 = 0, c4 = 0;
    printf("enter no of students:\n");
    scanf("%d",&n);
    for(i = 0; i < n; i++){
        printf("enter the name:\n");
        scanf("%s",&s[i].name);
        printf("select your preferred elective:\n");
        printf("1-IOT\t2-Advanced Java\t3-J2EE\t4-Advanced DS\n");
        scanf("%d",&s[i].choice);
    }
    printf("\n\n");
    printf("Students enrolled in IOT:\n");
    for (i = 0; i < n; i++){
        if(s[i].choice == 1){
            printf("%s\n",s[i].name);

            c1++;
        }
    }
    printf("No of students enrolled in elective:IOT: %d\n",c1);
    if (c1 < 3){
        printf("This course will not be streamed as total count is less than 3\n");
        for (i = 0; i < n; i++)
        {
            if (s[i].choice == 1)
            {
                printf("Please select other electives:\n");
                printf("Choose available electives\n");
                scanf("%d",&s[i].choice);
            }
        }
    }
    printf("Students enrolled in Advanced Java:\n");
    for (i = 0; i < n; i++)
    {
        if (s[i].choice == 2)
        {
            printf("%s\n",s[i].name);
            c2++;
        }
    }
    printf("No of students enrolled in elective:Advanced Java: %d\n", c2);
    if (c2 < 3)
```

```

{
    printf("This course will not be streamed as total count is less than 3\n");
    for (i = 0; i < n; i++)
    {
        if (s[i].choice == 2)
        {
            printf("Please select other electives:\n");
            printf("Choose available electives\n");
            scanf("%d", &s[i].choice);
        }
    }
}
printf("Students enrolled in J2EE:\n");
for (i = 0; i < n; i++)
{
    if (s[i].choice == 3)
    {
        printf("%s\n", s[i].name);
        c3++;
    }
}
printf("No of students enrolled in elective:J2EE: %d\n\n", c3);

if (c3 < 3)
{
    printf("This course will not be streamed as total count is less than 3\n");
    for (i = 0; i < n; i++)
    {
        if (s[i].choice == 3)
        {
            printf("Please select other electives:\n");
            printf("Choose available electives \n");
            scanf("%d", &s[i].choice);
        }
    }
}
printf("Students enrolled in Advanced DS\n");
for (i = 0; i < n; i++)
{
    if (s[i].choice == 4)
    {
        printf("%s\n", s[i].name);
        c4++;
    }
}
printf("No of students enrolled in elective: Advanced DS: %d\n", c4);
if (c4 < 3)
{
    printf("This course will not be streamed as total count is less than 3\n");
    for (i = 0; i < n; i++)
    {
        if (s[i].choice == 4)
        {
            printf("Please select other electives:\n");
            printf("Choose available electives\n");
            scanf("%d", &s[i].choice);
        }
    }
}

```

```
    }  
}  
}  
}
```

OUTPUT:

```
enter no of students:  
10  
enter the name:  
AMAN  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
1  
enter the name:  
ASHISH  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
1  
enter the name:  
BHUVAN  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
1  
enter the name:  
ABHYUDAY  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
2  
enter the name:  
GAUTAMI  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
2  
enter the name:  
NISCHAY  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
2  
enter the name:  
ABHISHEK  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
3
```

```
enter the name:  
AJEY  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
4  
enter the name:  
GAURAV  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
4  
enter the name:  
AMIT  
select your preferred elective:  
1-IOT 2-Advanced Java 3-J2EE 4-Advanced DS  
4
```

```
Students enrolled in IOT:  
AMAN  
ASHISH  
BHUVAN  
No of students enrolled in elective:IOT: 3  
Students enrolled in Advanced Java:  
ABHYUDAY  
GAUTAMI  
NISCHAY  
No of students enrolled in elective:Advanced Java: 3  
Students enrolled in J2EE:  
ABHISHEK  
No of students enrolled in elective:J2EE: 1  
  
This course will not be streamed as total count is less than 3  
Please select other electives:  
Choose available electives  
2  
Students enrolled in Advanced DS  
AJEY  
GAURAV  
AMIT
```

```
Students enrolled in Advanced DS  
AJEY  
GAURAV  
AMIT  
No of students enrolled in elective: Advanced DS: 3
```

```
...Program finished with exit code 52  
Press ENTER to exit console.
```

Program1: Pattern(input n no of rows from user)

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
....
```

```
import java.util.*;
class pattern
{
    public static void main(String args[])
    {
        Scanner ob = new Scanner(System.in);
        int i,j,n,k=1;
        System.out.println("Enter a number n");
        n = ob.nextInt();
        for(i=1;i<=n;i++)
        {
            for(j=1;j<=i;j++)
            {
                System.out.print(k+" ");
                k++;
            }
            System.out.println();
        }
    }
}
```

OUTPUT:

```
Enter a number n
4
1
2 3
4 5 6
7 8 9 10

-----
(program exited with code: 0)
Press return to continue
```

Program 3:Prime numbers between two numbers

```
#include <stdio.h>
#include<math.h>
int main()
{
    int i,j,m,n,c=0;
    printf("Enter 2 numbers, first one less than second one\n");
    scanf("%d%d",&m,&n);
    printf("The prime numbers between %d and %d:\n",m,n);
    for(i=m;i<=n;i++)
    {
        for(j=2;j<=sqrt(i);j++)
        {
            if(i%j==0)
            {
                c=1;
                break;
            }
        }
        if(c==0)
            printf("%d\n",i);
        c=0;
    }
}
```

OUPUT:

```
Enter 2 numbers, first one less than second one
15
30
The prime numbers between 15 and 30:
17
19
23
29
```

Quadratic:-

```
1) import java.util.*;
```

```
public class Quadratic
```

```
{
```

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

```
{
```

```
double a,b,c,d;
```

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

System.out.println ("This program finds roots of
the quadratic equation of the form

$ax^2 + bx + c$ ");

coefficients

System.out.println ("Enter the values of a , b and constant");

```
a = in.nextDouble();
```

```
b = in.nextDouble();
```

```
c = in.nextDouble();
```

```
d = b*b - 4*a*c;
```

```
b = b/(2*a);
```

```
if (d > 0)
```

```
{
```

```
d = Math.sqrt(d) / (2*a);
```

```
System.out.println ("Roots are ");
```

```
System.out.print ("(-b+d)/2*a and "+
```

$(-b - d));$

else if ($d == 0$)

* System.out.println ("The roots are equal;"
 $+ (-b));$

else

{

$d = \text{Math.sqrt}(-d) / (2 * a);$

System.out.println ("The roots are imaginary.
The roots are: ");

~~System.out.println (" $(-b) + " + i" + (d) + " and "$
 $+ (-b) + " - i" + (d));$~~

3

4

5

Changes in the code:-

* 1 :-

System.out.printf ("%-.4f and %-.4f",
 $(-b + d), (-b - d));$

* 2 :-

System.out.printf ("The roots are equal:
 %-.4f", $(-b));$

Program: Finding roots of Quadratic equations given coefficients of the powers of x.

```
import java.util.*;
public class Quadratic
{
    public static void main (String[] args)
    {
        double a,b,c,d,r1,r2;
        Scanner in = new Scanner(System.in);
        System.out.println("This program finds roots of the quadratic equation of the
form ax^2 + bx + c");
        System.out.println("Enter the values of coefficients of x^2,x and constant");
        a = in.nextDouble();
        b = in.nextDouble();
        c = in.nextDouble();
        d = b*b - 4*a*c;
        b = b/(2*a);
        if(d>0)
        {
            d = Math.sqrt(d)/(2*a);
            r1 = -b-d;
            r2 = -b+d;
            System.out.println("Roots are real and unequal:");
            System.out.printf("%.4f and %.4f",r1,r2);
        }
        else if(d==0)
        {
            System.out.printf("The roots are real and equal : %.4f",-b);
        }
        else
            System.out.println("The roots are imaginary");
    }
}
```

OUTPUT:

Case 1: Unequal real roots

```
This program finds roots of the quadratic equation of the form ax^2 + bx + c
Enter the values of coefficients of x^2,x and constant
1
3
2
Roots are real and unequal:
-2.0000 and -1.0000

-----
(program exited with code: 0)
Press return to continue
```

Case 2: Real equal roots:

```
This program finds roots of the quadratic equation of the form ax^2 + bx + c
Enter the values of coefficients of x^2,x and constant
1
2
1
The roots are real and equal : -1.0000

-----
(program exited with code: 0)
Press return to continue
```

Case 3: Imaginary roots:

```
This program finds roots of the quadratic equation of the form ax^2 + bx + c
Enter the values of coefficients of x^2,x and constant
1
1
1
The roots are imaginary

-----
(program exited with code: 0)
Press return to continue
```

1). Lab Program:-

```
import java.util.*;  
class Student  
{
```

```
    private String USN; int credits[];
```

```
    private String name; double marks[]
```

```
    private int n;
```

```
    private double GP = 0;
```

```
    private int totCredits = 0;
```

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

```
    void Details()
```

```
}
```

```
System.out.println("Enter the USN of the  
student");
```

```
USN = in.nextLine();
```

```
System.out.println("Enter the name of the  
student");
```

```
Name = in.nextLine();
```

```
System.out.println("Enter the no. of subjects");
```

```
n = in.nextInt();
```

```
credits = new int[n];
```

```
marks = new double[n];
```

System.out.println("Enter the details of the subject")
for (int i=0; i<n; i++)

P

System.out.println("Enter the credits allotted to
the subject " + (i+1));

credits[i] = in.nextInt();

System.out.println("Enter the marks of the
subject " + (i+1));

marks[i] = in.nextInt();

Calculate(credits[i], marks[i]);

q

j

void Calculate(int credit, double mark)

d

totCredits = totCredits + credit;

if (mark >= 90 && mark <= 100)

GP += (10 * credit);

else if (mark >= 80 && mark <= 89)

GP += (9 * credit);

else if (mark >= 70 && mark <= 79)

GP += (8 * credit);

else if (mark >= 60 && mark <= 59)

GP += (7 * credit);

else if (mark >= 50 && credit <= 59)

GP += (6 * credit);

else if (mark >= 40) && mark <= 49)
GP = GP + (5 * credit);

else

GP = GP;

}

void Display()

{

System.out.println("Details of the student");
System.out.println("Name : " + name);
System.out.println("USN : " + USN);
System.out.println("SGPA of student : " +
(GP / totCredits));

}

,

class Student Main {

{

public static void main (String args)

{

Student st = new Student();

st.Details();

st.Display();

}

,

1BM19CS073
KIRAN M K
05 October 2020

PROGRAM: STUDENT DETAILS: CALCULATE SGPA

CODE:

```
import java.util.*;
class Student
{
    private String USN;
    private String name;
    private int n;
    private double GP = 0;
    private int totCredits = 0;
    Scanner in = new Scanner(System.in);

    void Details()
    {
        System.out.println("Enter the USN of the student");
        USN = in.nextLine();
        System.out.println("Enter the name of the student");
        name = in.nextLine();
        System.out.println("Enter the no of subjects");
        n = in.nextInt();
        int credits[] = new int[n];
        double marks[] = new double[n];
        System.out.println("Enter the details of the subjects:");
        for(int i=0;i<n;i++)
        {
            System.out.println("Enter the credits allotted to the subject "+(i+1));
            credits[i] = in.nextInt();
            System.out.println("Enter the marks of the subject "+(i+1));
            marks[i] = in.nextInt();
            Calculate(credits[i],marks[i]);
        }
    }
    void Calculate(int credit,double mark)
    {
        totCredits = totCredits + credit;
        if(mark>=90&&mark<=100)
            GP = GP + (10*credit);
        else if(mark>=80 && mark<=89)
            GP = GP + (9*credit);
        else if(mark>=70&&mark<=79)
            GP = GP + (8*credit);
        else if(mark>=60&&mark<=69)
            GP = GP + (7*credit);
        else if(mark>=50 && mark<=59)
            GP = GP + (6*credit);
        else if(mark>=40&&mark<=49)
            GP = GP + (5*credit);
        else
            GP = GP;
    }
    void Display()
    {
        System.out.println("Details of the student");
    }
}
```

```

        System.out.println("Name :" +name);
        System.out.println("USN: "+USN);
        System.out.println("SGPA of student "+(GP/totCredits));
    }
}

class StudentMain
{
    public static void main(String []args)
    {
        Student s1 = new Student();
        s1.Details();
        s1.Display();
    }
}

```

OUTPUT:

```

Enter the USN of the student
1BM19CS073
Enter the name of the student
KIRAN M K
Enter the no of subjects
5
Enter the details of the subjects:
Enter the credits allotted to the subject 1
5
Enter the marks of the subject 1
89
Enter the credits allotted to the subject 2
4
Enter the marks of the subject 2
90
Enter the credits allotted to the subject 3
4
Enter the marks of the subject 3
92
Enter the credits allotted to the subject 4
4
Enter the marks of the subject 4
89
Enter the credits allotted to the subject 5
3
Enter the marks of the subject 5
88
Details of the student
Name :KIRAN M K
USN: 1BM19CS073
SGPA of student 9.4

```

1). Book :-

import java.util.*;

class Book

R

String author;

String name;

double price;

int num-pages;

Scanner in = new Scanner(System.in);

Book()

L

* this.author = author;

this.name = name;

this.price = price;

this.num-pages = num-pages;

y

void getDetails()

{

System.out.println("Enter name of book");

name = in.nextLine();

System.out.println("Enter name of author");

author = in.nextLine();

System.out.println("Enter the price in Rs");

price = in.nextDouble();

```
System.out.println("Enter the no. of pages");
numPages = in.nextInt();
```

3

```
public String toString()
```

```
return "AUTHOR: "+author+"\nNAME: "+name+
"\nPRICE in Rs." + price + "\nNo. of pages: " +
numPages;
```

4

```
class BookMain
```

of

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

at

```
int n;
```

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

```
System.out.println("Enter the number of books")
```

```
n = in.nextInt();
```

```
Book bk[] = new Book[n];
```

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

at

```
System.out.println("Enter the details of book
" + (i + 1));
```

```
bk[i] = new Book();
```

```
bk[i].getDetails();
```

3

```
System.out.println("-----");
System.out.println("Details of the books
entered:");
for (int i = 0; i < n; i++) {
    System.out.println("BOOK " + (i + 1) + ": ");
    System.out.println(bk[i]);}
```

3

4

3

Program 1: Books

```
import java.util.*;
class Book
{
    String author;
    String name;
    double price;
    int num_pages;
    Scanner in = new Scanner(System.in);
    Book()
    {
        this.author = author;
        this.name = name;
        this.price = price;
        this.num_pages = num_pages;
    }
    void getDetails()
    {

        System.out.println("Enter the name of the book");
        name = in.nextLine();
        System.out.println("Enter the name of the author ");
        author = in.next();
        System.out.println("Enter the price in Rs.");
        price = in.nextDouble();
        System.out.println("Enter the no of pages");
        num_pages = in.nextInt();

    }
    public String toString()
    {

        return("AUTHOR : "+author+"\nNAME: "+name+"\nPRICE in Rs."+price+"\nNo
of pages: "+num_pages);
    }
}
class BookMain
{
    public static void main(String args[])
    {
        int n;
        Scanner in = new Scanner(System.in);
        System.out.println("Enter the number of books");
        n = in.nextInt();
        Book bk[] = new Book[n];
        for(int i = 0;i<n;i++)
        {
            System.out.println("Enter the details of BOOK "+(i+1));
            bk[i] = new Book();
            bk[i].getDetails();
        }
        System.out.println("-----");
        System.out.println("Details of the books entered:");
    }
}
```

```

        for(int i = 0;i<n;i++)
        {
            System.out.println("BOOK "+(i+1)+" : ");
            System.out.println(bk[i]);
        }
    }
}

```

OUTPUT:

```

Enter the number of books
3
Enter the details of BOOK 1
Enter the name of the book
PROBLEMS PLUS IN IIT MATH
Enter the name of the author
ASITDASGUPTA
Enter the price in Rs.
400
Enter the no of pages
850
Enter the details of BOOK 2
Enter the name of the book
PROBLEMS IN GENERAL PHYSICS
Enter the name of the author
IEIRODOV
Enter the price in Rs.
50
Enter the no of pages
150
Enter the details of BOOK 3
Enter the name of the book
VAMSHAVRUKSHA
Enter the name of the author
SLBHYRAPPA
Enter the price in Rs.
300
Enter the no of pages
550
-----
Details of the books entered:
BOOK 1 :
AUTHOR : ASITDASGUPTA
NAME: PROBLEMS PLUS IN IIT MATH
PRICE in Rs.400.0
No of pages: 850
BOOK 2 :
AUTHOR : IEIRODOV
NAME: PROBLEMS IN GENERAL PHYSICS
PRICE in Rs.50.0
No of pages: 150
BOOK 3 :
AUTHOR : SLBHYRAPPA
NAME: VAMSHAVRUKSHA
PRICE in Rs.300.0
No of pages: 550

```

Program 2: Employee

```

import java.util.*;
class Employee
{
    public static double empgross;
    public static String empname;
    public static String empid;
    public static double da;
    public static double hra;
    public static double it;
    public static double basic;
    public static int toth;
    public static int oth;
}

```

```

Scanner in = new Scanner(System.in);
void accept()
{
    System.out.println("Enter details");
    System.out.println("Name: ");
    empname = in.next();
    System.out.println("ID:");
    empid = in.next();
    System.out.println("Basic salary in Rs.");
    basic = in.nextDouble();
    System.out.println("DA HRA and IT in %");
    da = in.nextDouble();
    hra = in.nextDouble();
    it = in.nextDouble();
    System.out.println("Enter the total no of hours worked including OT");
    toth = in.nextInt();
    System.out.println("OT hours");
    oth = in.nextInt();
}
void gross()
{
    empgross = basic * (da + hra - it + 100)/100;
}
void calculation()
{
    empgross = empgross + (oth * 100);
    if(toth>=200)
    {
        empgross = empgross + ((toth - 200)*100);
    }
    else
    {
        empgross = empgross - ((200 - toth)*100);
    }
    display();
}
void display()
{
    System.out.println("Name: "+empname);
    System.out.println("Gross Salary: Rs."+empgross);
}
class EmpMain
{
    public static void main(String []args)
    {
        Employee e1 = new Employee();
        e1.accept();
        e1.gross();
        e1.calculation();
    }
}

```

OUTPUT:

```
Enter details
Name:
ANIRUDH
ID:
234
Basic salary in Rs.
90000
DA HRA and IT in %
2 5 9
Enter the total no of hours worked including OT
250
OT hours
40
Name: ANIRUDH
Gross Salary: Rs.97200.0
```

PROGRAM 3: AGE

```
/*
 * Copyright 2020 Kiran M K
 */
import java.util.*;
class Age
{
    public String name;
    public int years;
    public int months;
    Scanner in = new Scanner(System.in);
    void accept()
    {
        System.out.println("Enter name");
        name = in.nextLine();
        System.out.println("Enter the age in years and months");
        years = in.nextInt();
        months = in.nextInt();
        System.out.println("-----");
    }
}
class AgeMain
{
    public static void main(String args[])
    {
        Age p1 = new Age();
        Age p2 = new Age();
        p1.accept();
        p2.accept();

        if(p1.years>p2.years)
            System.out.println(p1.name+" is elder than "+p2.name);
        else if(p1.years == p2.years)
        {
            if(p1.months > p2.months)
```

```
        System.out.println(p1.name+" is elder than "+p2.name);
    else if(p1.months == p2.months)
        System.out.println(p1.name + " and "+p2.name+" are of same age");
    else
        System.out.println(p2.name+" is elder than "+p1.name);
}
else
    System.out.println(p2.name+" is elder than "+p1.name);
}
```

OUTPUT:

```
| Enter name
| DR.SWAMY
| Enter the age in years and months
| 81 1
| -----
| Enter name
| NARENDRA MODI
| Enter the age in years and months
| 68 1
| -----
| DR.SWAMY is elder than NARENDRA MODI
```

3 - " import java.util.*;

abstract class Shape

{} int dim1, dim2;

abstract void printArea();

Shape (int a, int b)

{ dim1 = a;

dim2 = b;

}

3

class Rectangle extends Shape

{ Rectangle (int a, int b)

{ super (a, b); }

void printArea ()

{ System.out.println ("Area of rectangle -
" + (dim1 * dim2) + " sq . units"); }

4

class Triangle extends Shape

{ Triangle (int a, int b)

{ super (a, b); }

void printArea ()

{ System.out.println ("Area of triangle =
" + ((double) dim1 * dim2) / 2) + "

sq . units"); }

5

3

class Circle extends Shape

o Circle (int a, int b)

o Super (a, b);
y

void printArea()

o System.out.println ("The area of
rectangle = "+area + " sq. units");

y

3

class ShapeMain

o

public static void main (String args[])

o int a, b;

Scanner in = new Scanner (System.in);

System.out.println ("Enter the dimensions
of rectangle ");

a = in.nextInt();

b = in.nextInt(); \therefore Rectangle r = new Rectangle (a, b);

System.out.println ("Enter the base breadth of
base and height of triangle ");

a = in.nextInt();

b = in.nextInt();

Triangle t = new Triangle (a, b);

System.out.println ("Enter the radius of
circle ");

a = in.nextInt();

Circle c = new Circle(a, a);

s.printArea(); t.printArea(); c.printArea();

y

y.

import java.util.*;

class Pk

Circle c = new Circle();
c.printArea(); t.printArea(); c.p

y

y.

import java.util.*;

class Bank

{ String name, Accno;
int type;

Scanner in = new Scanner(System.in);

void input()

{

System.out.println("Enter your name
and acc no.");

name = in.next();

Accno = in.nextInt();

System.out.println("Enter type of Accno
1. Savings 2. Current");

type = in.nextInt();

}

}

class Savings extends Bank.

d

double deposit, rate = 0.04, withdrawal, balance,
int days, ch;

Scanner in = new Scanner (System.in);

void calc (String nm, String acc)

d

System.out.println ("Hello "+nm+" AccNo: "+acc)

System.out.println ("Please enter your first
balance in Rs.");

balance = in.nextInt();

for (j; j <= 10; j++)

d System.out.println ("Hello "+nm+" Account
No. : "+acc);

System.out.println ("What do you want to
do today? 1. Please enter 1. Deposit
2. Withdrawal 3. View Balance 4. exit")

ch = in.nextInt();

switch (ch)

c

case 1: System.out.println ("Please enter the
deposit amount in Rs.");

deposit = in.nextDouble();

System.out.println ("Please enter the no.
of days");

days = in.nextInt();

balance += deposit;

balance * = Math.pow((1 + rate / 36500),
(365 * days));

break;

case 2: System.out.println("Please enter the
withdrawal amount in Rs.");

withdrawal = in.nextDouble();

System.out.println("Please enter the no. of
days");

days = in.nextInt();

if (withdrawal > balance)

System.out.println("Sorry! Insufficient
Balance !!");

else

balance -= withdrawal;

balance * = Math.pow((1 + rate / 36500),
(365 * days));

4

break;

case 3: System.out.println("Balance = Rs"
+ balance);

break;

669

```
default: System.out.println("thank you for
visiting !!");
System.exit(0);
break;
```

{

}

{

}

class Current extends Bank.

x

double deposit, withdrawal, balance, minbal = 10000;

int days, ch;

Scanner in = new Scanner(System.in);

void calc (String nm, String acc)

{

System.out.println("Hello "+nm+" Account no: "+

acc);

System.out.println("Please enter your first balance
in RS.");

balance = Integer.parseInt();

for (;

)

System.out.println("Hello "+nm+" Account No: "+

acc);

System.out.println("What do you want to do today? 1. Please enter Int. Deposit 2. withdraw
In 3. View Balance In 4. exit");
ch = in.nextInt();
switch(ch){

case 1: if (balance < minbal)
{ System.out.println("Penalty for not
maintaining min. bal: Rs. 600");
balance -= 600;

y
System.out.println("Please enter the depo-
amount in Rs.");
deposit = in.nextDouble();
balance += deposit;
break;

case 2: if (balance < minbal)
{ System.out.println("Penalty for not
maintaining min balance : Rs. 600");
balance -= 600;

y
System.out.println("Please enter the
withdrawal amount in Rs.");
withdrawal = in.nextDouble();

if (withdrawal > balance)

System.out.println ("Sorry! Insufficient
Balance");

else

 by: balance -= withdrawal;
 break;

case 3: if (balance < minbal)

\leftarrow System.out.println ("Penalty for not
 maintaining minimum balance: Rs. 600");
 balance -= 600;

 y

 System.out.println ("Balance : Rs. " + balance);
 break;

default: System.out.println ("Thank you
for visiting !!");

 System.exit(0);
 break;

 y

 y

 y

class BankMain
of public static void main (String args)

Bank cust = new Bank();

cust.input();

if (cust.type == 1)

{

Savings custs = new Savings();

custs.cal (cust.name, cust.aceno);

}

else

{

Current custc = new Current();

custc.cal (cust.name, cust.aceno);

}

}

}

Program: 2D shapes

```
import java.util.*;
abstract class Shape
{
    int dim1,dim2;
    abstract void printArea();
    Shape(int a,int b)
    {
        dim1 = a;
        dim2 = b;
    }

}
class Rectangle extends Shape
{
    Rectangle(int a,int b)
    {
        super(a,b);
    }
    void printArea()
    {
        System.out.println("The area of rectangle = "+(dim1*dim2)+" sq.units");
    }
}
class Triangle extends Shape
{
    Triangle(int a,int b)
    {
        super(a,b);
    }
    void printArea()
    {
        System.out.println("The area of triangle = "+(((double)dim1 * dim2)/2)+" sq. units");
    }
}
class Circle extends Shape
{
    Circle(int a,int b)
    {
        super(a,b);
    }
    void printArea()
    {
        double area = 3.1415*(dim1*dim2);
        System.out.println("The area of rectangle = "+area+" sq.units");
    }
}
class ShapeMain
{
    public static void main(String args[])
    {
        int a,b;
        Scanner in = new Scanner(System.in);
        System.out.println("Enter the dimensions of Rectangle");
        a = in.nextInt();
        b = in.nextInt();
        Rectangle r = new Rectangle(a,b);
        System.out.println("Enter the base length and height length of Triangle");
```

```

        a = in.nextInt();
        b = in.nextInt();
        Triangle t = new Triangle(a,b);
        System.out.println("Enter the radius of Circle");
        a = in.nextInt();
        Circle c = new Circle(a,a);
        r.printArea();
        t.printArea();
        c.printArea();

    }
}

```

Output:

```

Enter the dimensions of Rectangle
12
15
Enter the base length and height length of Triangle
6
8
Enter the radius of Circle
10
The area of rectangle = 180 sq.units
The area of triangle = 24.0 sq. units
The area of rectangle = 314.15000000000003 sq.units

```

Program: Bank

```

import java.util.*;
class Bank
{
    String name,Accno;
    int type;
    Scanner in = new Scanner(System.in);
    void input()
    {
        System.out.println("Enter your name");
        name = in.next();
        System.out.println("Enter your Account Number");
        Accno = in.next();
        System.out.println("Enter your Account type : 1 for Savings and 2 for current");
        type = in.nextInt();
    }
}
class Savings extends Bank
{
    double deposit,rate = 0.04,withdrawal, balance;
    int days,ch;
    Scanner in = new Scanner(System.in);
    void calc(String nm,String Acc)
    {
        System.out.println("Hello "+nm+" . Account No. :" +Acc);
        System.out.println("Please enter your first balance in Rs.");
        balance = in.nextDouble();
        for(;;)
        {
            System.out.println("Hello "+nm+" . Account No. :" +Acc);
            System.out.println("What do you want to today?\n Please enter \n1.
Deposit\n2.Withdrawal\n3.View Balance\n4.exit");

```

```

ch = in.nextInt();
switch(ch)
{
    case 1: System.out.println("Please enter the deposit amount in Rs.");
              deposit = in.nextDouble();
              System.out.println("Please enter the no. of days ");
              days = in.nextInt();
              balance+=deposit;
              balance *= Math.pow((1 + rate/36500),(365*days));

              break;
    case 2: System.out.println("Please enter the withdrawal amount in
Rs.");
              withdrawal = in.nextDouble();
              System.out.println("Please enter the no. of days ");
              days = in.nextInt();
              if(withdrawal>balance)
                  System.out.println("Sorry! Insufficient
Balance");
              else
              {
                  balance-= withdrawal;
                  balance *= Math.pow((1 + rate/36500),
(365*days));
              }
              break;
    case 3: System.out.println("Balance: Rs." +balance);
              break;
    default: System.out.println("Thank you for visiting!!!");
              System.exit(0);
              break;
}
}
}

class Current extends Bank
{
    double deposit,withdrawal, balance,minbal=10000;
    int days,ch;
    Scanner in = new Scanner(System.in);
    void calc(String nm,String Acc)
    {
        System.out.println("Hello "+nm+" . Account No. :" +Acc);
        System.out.println("Please enter your first balance in Rs.");
        balance = in.nextDouble();
        for(;;)
        {
            System.out.println("Hello "+nm+" . Account No. :" +Acc);
            System.out.println("What do you want to today?\n Please enter \n1.
Deposit\n2.Withdrawal\n3.View Balance\n4.exit");
            ch = in.nextInt();
            switch(ch)
            {
                case 1: if(balance<minbal)
                {
                    System.out.println("Penalty for not maintaining
minimum balance : Rs.600");
                    balance-= 600;
                }
            }
        }
    }
}

```

```

        System.out.println("Please enter the deposit amount
in Rs.");
        deposit = in.nextDouble();
        balance+=deposit;
        break;
    case 2: if(balance<minbal)
    {
        System.out.println("Penalty for not maintaining
minimum balance : Rs.600");
        balance-= 600;
    }
    System.out.println("Please enter the withdrawal
withdrawal = in.nextDouble();

if(withdrawal>balance)
    System.out.println("Sorry! Insufficient
Balance");
else
    balance-= withdrawal;

break;
    case 3: if(balance<minbal)
    {
        System.out.println("Penalty for not maintaining
minimum balance : Rs.600");
        balance-= 600;
    }
    System.out.println("Balance: Rs." +balance);
    break;
    default: System.out.println("Thank you for visiting!!!");
        System.exit(0);
        break;
    }
}
}
}

class BankMain
{
    public static void main(String args[])
    {
        Bank cust = new Bank();
        cust.input();
        if(cust.type == 1)
        {
            Savings custs = new Savings();
            custs.calc(cust.name,cust.Accno);
        }
        else
        {
            Current custc = new Current();
            custc.calc(cust.name,cust.Accno);
        }
    }
}

```

Output:

```
Enter your name
KIRAN
Enter your Account Number
12345678
Enter your Account type : 1 for Savings and 2 for current
1
Hello KIRAN . Account No. :12345678
Please enter your first balance in Rs.
10000
Hello KIRAN . Account No. :12345678
What do you want to today?
Please enter
1. Deposit
2.Withdrawal
3.View Balance
4.exit
1
Please enter the deposit amount in Rs.
2500
Please enter the no. of days
10
Hello KIRAN . Account No. :12345678
What do you want to today?
Please enter
1. Deposit
2.Withdrawal
3.View Balance
4.exit
2
Please enter the withdrawal amount in Rs.
1500
Please enter the no. of days
5
Hello KIRAN . Account No. :12345678
What do you want to today?
Please enter
1. Deposit
2.Withdrawal
3.View Balance
4.exit
3
Balance: Rs.11072.222408972397
Hello KIRAN . Account No. :12345678
What do you want to today?
Please enter
1. Deposit
2.Withdrawal
3.View Balance
4.exit
4
Thank you for visiting!!
```