#include<stdio.h>

#include<conio.h>

#include<math.h>

#define pi 3.1415

int main()

{

int a,b,c,c1,c2,c3,c4,option,numerator,denominator,remainder;

float x,y,z,z1,z2,z3,z4,z5;

double d,e;

clrscr();

printf("\nMenu\n1.Arithmetic\n2.Logic\n3.Unit Convertors\n4.Mensuration\n");

printf("\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("\nArithmetic\n\n1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n5.Modulus\n6.Logarithm");

printf("\n7.Power\n8.Trigonometry\n\9.Factorial\n10.LCM & GCD\n");

printf("\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("Enter two numbers\t");

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

c=a+b;

printf("%d+%d=%d\t",a,b,c);

break;

case 2:

clrscr();

printf("Enter two numbers\t");

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

c=a-b;

printf("%d-%d=%d\t",a,b,c);

break;

case 3:

clrscr();

printf("Enter two numbers\t");

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

c=a\*b;

printf("%dx%d=%d\t",a,b,c);

break;

case 4:

clrscr();

printf("Enter two numbers\t");

scanf("%f%f",&x,&y);

z=x/y;

printf("%0.2f/%0.2f=%0.2f\t",x,y,z);

break;

case 5:

clrscr();

printf("Enter two numbers\t");

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

c=a%b;

printf("%d%%%d=%d\t",a,b,c);

break;

case 6:

clrscr();

printf("Enter the number\n");

scanf("%d",&a);

d=log(a);

e=log10(a);

printf("ln(%d)=%0.3lf\n",a,d);

printf("log(%d)=%0.3lf\n",a,e);

break;

case 7:

clrscr();

printf("Enter the number and power\t");

scanf("%f%f",&x,&y);

z=pow(x,y);

printf("%0.1f to the power %0.1f is %0.3f",x,y,z);

break;

case 8:

clrscr();

printf("Enter angle in degrees\t");

scanf("%d",&a);

z=(a\*pi)/180;

y=sin(z);

z1=cos(z);

z2=tan(z);

z3=1/y;

z4=1/z1;

z5=1/z2;

printf("sin(%d)=%0.3f\n",a,y);

printf("cos(%d)=%0.3f\n",a,z1);

if(a==90)

printf("tan(%d)=Not defined\n",a);

else

printf("tan(%d)=%0.3f\n",a,z2);

if(a==0)

printf("cosec(%d)=Not defined\n",a);

else

printf("cosec(%d)=%0.3f\n",a,z3);

if(a==90)

printf("sec(%d)=Not defined\n",a);

else

printf("sec(%d)=%0.3f\n",a,z4);

if(a==0)

printf("cot(%d)=Not defined\n",a);

else

printf("cot(%d)=%0.3f\n",a,z5);

break;

case 9:

clrscr();

printf("Enter the number\n");

scanf("%d",&a);

d=1;

b=1;

while(b<=a)

{

d=d\*b;

b++;

}

printf("%d!=%0.1lf",a,d);

break;

case 10:

clrscr();

printf("Enter two numbers\n");

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

if(a>b)

{

numerator=a;

denominator=b;

}

else

{

numerator=b;

denominator=a;

}

remainder=numerator%denominator;

while(remainder!=0)

{

numerator=denominator;

denominator=remainder;

remainder=numerator%denominator;

}

c1=denominator;

c2=a\*b/c1;

printf("LCM of %d and %d = %d\n",a,b,c2);

printf("GCD of %d and %d = %d\n",a,b,c1);

break;

default:

printf("Error\n");

}

break;

case 2:

clrscr();

printf("Logic\n\n");

printf("Enter two binary numbers\t");

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

c1=a&b;

c2=a|b;

c3=a^b;

c4=!a;

c=!b;

printf("%d AND %d = %d\n",a,b,c1);

printf("%d OR %d = %d\n",a,b,c2);

printf("%d XOR %d = %d\n",a,b,c3);

printf("%d'=%d\n",a,c4);

printf("%d'=%d\n",b,c);

break;

case 3:

clrscr();

printf("\nUnit Convertors\n\n1.Temperature\n2.Angle\n3.Distance\n4.Time\n");

printf("\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("Temperature\n");

printf("\n1.Celsius\n2.Fahrenheit\n3.Kelvin\n");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("Celsius\n");

printf("\nEnter temperature in celsius\t");

scanf("%f",&z);

x=1.8\*z+32;

y=z+273.15;

printf("\n%0.2f C = %0.2f F\n",z,x);

printf("%0.2f C = %0.2f K\n",z,y);

break;

case 2:

clrscr();

printf("Fahrenheit\n");

printf("\nEnter temperature in fahrenheit\t");

scanf("%f",&x);

y=((x+459.67)\*5)/9;

z=0.5556\*(x-32);

printf("\n%0.2f F = %0.2f C\n",x,z);

printf("%0.2f F = %0.2f K\n",x,y);

break;

case 3:

clrscr();

printf("Kelvin\n");

printf("\nEnter temperature in kelvin\t");

scanf("%f",&x);

y=x-273.15;

z=(x\*1.8)-459.67;

printf("\n%0.2f K = %0.2f C\n",x,y);

printf("%0.2f K = %0.2f F\n",x,z);

break;

}

break;

case 2:

clrscr();

printf("Angle\n");

printf("\n1.Degree\n2.Radian\n3.Gradian\n");

printf("\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("Degree\n");

printf("\nEnter angle in degree\t");

scanf("%d",&a);

x=a\*pi/180;

y=a\*1.111;

printf("%d degree = %0.3f radian\n",a,x);

printf("%d degree = %0.3f gradian\n",a,y);

break;

case 2:

clrscr();

printf("Radian\n");

printf("\nEnter angle in radian\t");

scanf("%d",&a);

x=a\*180/pi;

y=a\*63.662;

printf("%d radian = %0.3f degree\n",a,x);

printf("%d radian = %0.3f gradian\n",a,y);

break;

case 3:

clrscr();

printf("Gradian\n");

printf("\nEnter angle in gradian\t");

scanf("%d",&a);

x=a\*0.9;

y=a\*0.0157;

printf("%d gradian = %0.3f degree\n",a,x);

printf("%d gradian = %0.3f radian\n",a,y);

break;

}

break;

case 3:

clrscr();

printf("Length\n");

printf("\n1.Metre\n2.Feet\n3.Inch\n");

printf("\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("Metre\n");

printf("\nEnter length in metre\t");

scanf("%d",&a);

x=a\*3.280;

y=a\*39.37;

printf("%d metre = %0.3f feet\n",a,x);

printf("%d metre = %0.3f inch\n",a,y);

break;

case 2:

clrscr();

printf("Feet\n");

printf("\nEnter length in feet\t");

scanf("%d",&a);

x=a\*0.3048;

y=a\*12;

printf("%d feet = %0.3f metre\n",a,x);

printf("%d feet = %0.3f inch\n",a,y);

break;

case 3:

clrscr();

printf("Inch\n");

printf("\nEnter length in inch\t");

scanf("%d",&a);

x=a\*0.0254;

y=a\*0.0833;

printf("%d inch = %0.3f metre\n",a,x);

printf("%d inch = %0.3f feet\n",a,y);

break;

}

break;

case 4:

clrscr();

printf("Time\n");

printf("\n1.Second\n2.Minute\n3.Hour\n");

printf("\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("Second\n");

printf("\nEnter time in second\t");

scanf("%d",&a);

x=a/60;

y=a\*3600;

printf("%d second = %0.3f minute\n",a,x);

printf("%d second = %0.3f hour\n",a,y);

break;

case 2:

clrscr();

printf("Minute\n");

printf("\nEnter time in minute\t");

scanf("%d",&a);

x=a\*60;

y=a/60;

printf("%d minute = %0.3f second\n",a,x);

printf("%d minute = %0.3f hour\n",a,y);

break;

case 3:

clrscr();

printf("Hour\n");

printf("\nEnter time in hour\t");

scanf("%d",&a);

x=a\*3600;

y=a\*60;

printf("%d hour = %0.3f second\n",a,x);

printf("%d hour = %0.3f minute\n",a,y);

break;

}

break;

}

break;

case 4:

clrscr();

printf("\nMensuration\n");

printf("1.Square\n2.Rectangle\n3.Circle\n4.Cube\n");

printf("5.Cuboid\n6.Sphere\n7.Hemisphere\n8.Cylinder\n");

printf("9.Cone\t\n10.Equilateral Triangle\n11.Isosceles Triangle\n12.Scalene Triangle\n13.Right Angled Triangle\n");

printf("\n\nEnter option\t");

scanf("%d",&option);

switch(option)

{

case 1:

clrscr();

printf("\nSquare\n");

printf("Enter side\t");

scanf("%d",&a);

b=a\*a;

c=4\*a;

x=sqrt(2)\*a;

printf("Side = %d\n",a);

printf("Area = side x side = %d\n",b);

printf("Perimeter = 4 x side = %d\n",c);

printf("Length of diagonal=%0.3f",x);

break;

case 2:

clrscr();

printf("Rectangle\n");

printf("Enter length and breadth\t");

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

printf("Length (l)=%d\n",a);

printf("Breadth (b)=%d\n",b);

c=a\*b;

c1=2\*(a+b);

x=sqrt(pow(a,2)+pow(b,2));

printf("Area=lxb=%d\n",c);

printf("Perimeter=2(l+b)=%d\n",c1);

printf("Length of diagonal=%0.3f\n",x);

break;

case 3:

clrscr();

printf("\nCircle\n");

printf("Enter radius\t");

scanf("%d",&a);

x=pi\*a\*a;

y=2\*pi\*a;

printf("Area=%0.2f\n",x);

printf("Circumference=%0.2f\n",y);

break;

case 4:

clrscr();

printf("\nCube\n");

printf("Enter side\t");

scanf("%d",&a);

b=pow(a,3);

c=4\*pow(a,2);

c1=6\*pow(a,2);

x=a\*sqrt(3);

printf("\nLength of face = %d\n",a);

printf("Volume = %d\n",b);

printf("Lateral surface area = %d\n",c);

printf("Total surface area = %d\n",c1);

printf("Length of diagonal = %0.2f\n",x);

break;

case 5:

clrscr();

printf("\nCuboid\n");

printf("Enter length,breadth and height\t");

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

c1=a\*b\*c;

c2=2\*c\*(a+b);

c3=2\*(a\*b+b\*c+a\*c);

x=sqrt(pow(a,2)+pow(b,2)+pow(c,2));

printf("\nLength (l) = %d\n",a);

printf("Breadth (b) = %d\n",b);

printf("Height (h) = %d\n",c);

printf("Volume = lxbxh = %d\n",c1);

printf("Lateral surface area = %d\n",c2);

printf("Total surface area = %d\n",c3);

printf("Length of diagonal = %0.2f\n",x);

break;

case 6:

clrscr();

printf("\nSphere\n");

printf("Enter radius\t");

scanf("%d",&a);

x=(4\*pi\*pow(a,3))/3;

y=4\*pi\*pow(a,2);

printf("Volume = %0.2f\n",x);

printf("Surface area = %0.2f\n",y);

break;

case 7:

clrscr();

printf("\nHemisphere\n");

printf("Enter radius\t");

scanf("%d",&a);

x=(2\*pi\*pow(a,3))/3;

y=2\*pi\*pow(a,2);

printf("Volume = %0.2f\n",x);

printf("Surface area = %0.2f\n",y);

break;

case 8:

clrscr();

printf("\nCylinder\n");

printf("Enter radius\t");

scanf("%d",&a);

printf("Enter height\t");

scanf("%d",&b);

x=pi\*pow(a,2)\*b;

y=2\*pi\*a\*b;

z=2\*pi\*a\*(a+b);

printf("Volume = %0.2f\n",x);

printf("Curved surface area = %0.2f\n",y);

printf("Total surface area = %0.2f\n",z);

break;

case 9:

clrscr();

printf("\nCone\n");

printf("Enter radius\t");

scanf("%d",&a);

printf("Enter height\t");

scanf("%d",&b);

x=(pi\*pow(a,2)\*b)/3;

z1=sqrt(pow(a,2)+pow(b,2));

y=pi\*a\*z1;

z=pi\*a\*(a+z1);

printf("Volume = %0.2f\n",x);

printf("Slant height = %0.2f\n",z1);

printf("Curved surface area = %0.2f\n",y);

printf("Total surface area = %0.2f\n",z);

break;

case 10:

clrscr();

printf("Equilateral Triangle\n");

printf("Enter side\t");

scanf("%d",&a);

x=(sqrt(3)\*pow(a,2))/4;

b=3\*a;

y=(sqrt(3)\*a)/2;

printf("Area=%0.2f\n",x);

printf("Perimeter=%d\n",b);

printf("Height=%0.2f\n",y);

break;

case 11:

clrscr();

printf("Isosceles Triangle\n");

printf("Enter sides 1 & 2\t");

scanf("%d",&a);

printf("Enter side 3\t");

scanf("%d",&b);

x=(b\*sqrt(4\*pow(a,2)-pow(b,2))/4);

c=2\*a+b;

printf("Area=%0.2f\n",x);

printf("Perimeter=%d\n",c);

break;

case 12:

clrscr();

printf("Scalene Triangle\n");

printf("Enter side 1\t");

scanf("%d",&a);

printf("Enter side 2\t");

scanf("%d",&b);

printf("Enter side 3\t");

scanf("%d",&c);

z=(a+b+c)/2;

x=sqrt(z\*(z-a)\*(z-b)\*(z-c));

c2=a+b+c;

printf("Area=%0.2f\n",x);

printf("Perimeter=%d\n",c2);

break;

case 13:

clrscr();

printf("Right Angled Triangle\n\n");

printf("Enter base\t");

scanf("%d",&a);

printf("Enter height\t");

scanf("%d",&b);

x=0.5\*a\*b;

y=sqrt(pow(a,2)+pow(b,2));

z=a+b+y;

printf("Area=%0.3f",x);

printf("\nLength of hypotenuse=%0.3f",y);

printf("\nPerimeter=%0.3f",z);

break;

}

break;

}

getch();

return 0;

}