PSAP ASSIGNMENT 01

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**ASSIGNMENT : QUADRATIC EQUATIONS**

**Problem statement**:

User will be prompted to provide coefficients a, b, c.

The program will give solution of the given equation along with the comment on type of equation / roots.

**CODE**:

#include<stdio.h>

#include<math.h>

int main()

{

   float a=0.0,b=0.0,c=0.0,D,val=0.0,r,s,t,u,v,w,x,y,z;

   printf("This program solves quadratic equation aX^2 + bX + C = 0 \n");

   printf("Give values of a,b,c : ");

   scanf("%f %f %f",&a,&b,&c);

   if(a==0 && b==0 && c==0)

   {

   printf("Infinite solutions.");

   }

   if(a==0 && b==0 && c!=0)

   {

    printf("Inconsistent equation.");

   }

   if(a==0 && b!=0 && c!=0)

   {

      val=-(c/b);

      printf("Linear equation with single solution x=%f",val);

    }

   if(a!=0 && b!=0 && c!=0)

   {

      D=sqrt((b\*b)-(4\*a\*c));

      w=((b\*b)-(4\*a\*c));

      x=abs(w);

      y=sqrt(x);

      z=y/(2\*a);

      if(D>0)

      {

        r=((-b)+D)/(2\*a);

        s=((-b)-D)/(2\*a);

        printf("Real and distinct roots : \n");

        printf("x1 = %f \n",r);

        printf("x2 = %f",s);

      }

      if(D==0)

      {

         t=((-b)+D)/(2\*a);

         printf("Real and repeated roots : \n");

         printf("x1 = %f \n",t);

         printf("x2 = %f",t);

       }

       if(w<0)

       {

            u=(-b)/(2\*a);

            printf("Complex roots : \n");

            printf("x1 = %f + %fi \n",u,z);

            printf("x2 = %f - %fi",u,z);

        }

   }

}

**OUTPUT**:





