

{1992 ACM Mid-Central Regional Programming Contest  
Sample Solution to Problem #5 - Super Sphere}

```
program sphere(input,output);
const
    e = 0.0001;
type
    vector_type = array [1..20] of real;
var
    ifile,ofile: text;
    m,K,L: integer;
    center,total,v,y: vector_type;
    x: array [1..40] of vector_type;
    i,j,count: integer;
    d,radius: real;

function dist(v:vector_type; center: vector_type):real;
var
    sum: real;
    i: integer;
begin
    sum := 0.0;
    for i:= 1 to m do begin
        sum := sum + (v[i]-center[i])*(v[i]-center[i]);
    end;
    dist := sqrt(sum);
end;

begin
    assign(ifile,'sphere.in');
    reset(ifile);
    assign(ofile,'sphere.out');
    rewrite(ofile);
    count := 0;
    read(ifile,m);
    while m > 0 do begin
        count := count + 1;
        readln(ifile,K,L);
        for i := 1 to m do total[i] := 0;
        for i := 1 to K do begin
            for j := 1 to m do begin
                read(ifile,x[i,j]);
                total[j] := total[j] + x[i,j];
            end;
            readln(ifile);
        end;
        for i := 1 to m do center[i] := total[i] / K;
        radius := 0.0;
        for i := 1 to K do begin
            for j:= 1 to m do v[j] := x[i,j];
            d := dist(v,center);
            if d > radius then radius := d;
        end;
        writeln(ofile,'DATA SET #',count:1);
        for i := 1 to L do begin
            write(ofile,'TEST POINT #',i:1);
            for j := 1 to m do read(ifile,y[j]);
            readln(ifile);
            if dist(y,center)-radius <= e then writeln(ofile,' - INSIDE')
            else writeln(ofile,' - OUTSIDE');
```

```
end;  
writeln(ofile);  
  
    read(ifile,m)  
end;  
writeln(ofile,'ALL DATA SETS HAVE BEEN PROCESSED.');
```

close (ifile);  
close (ofile);  
end.