PointOnTheCircle

Script Documentation

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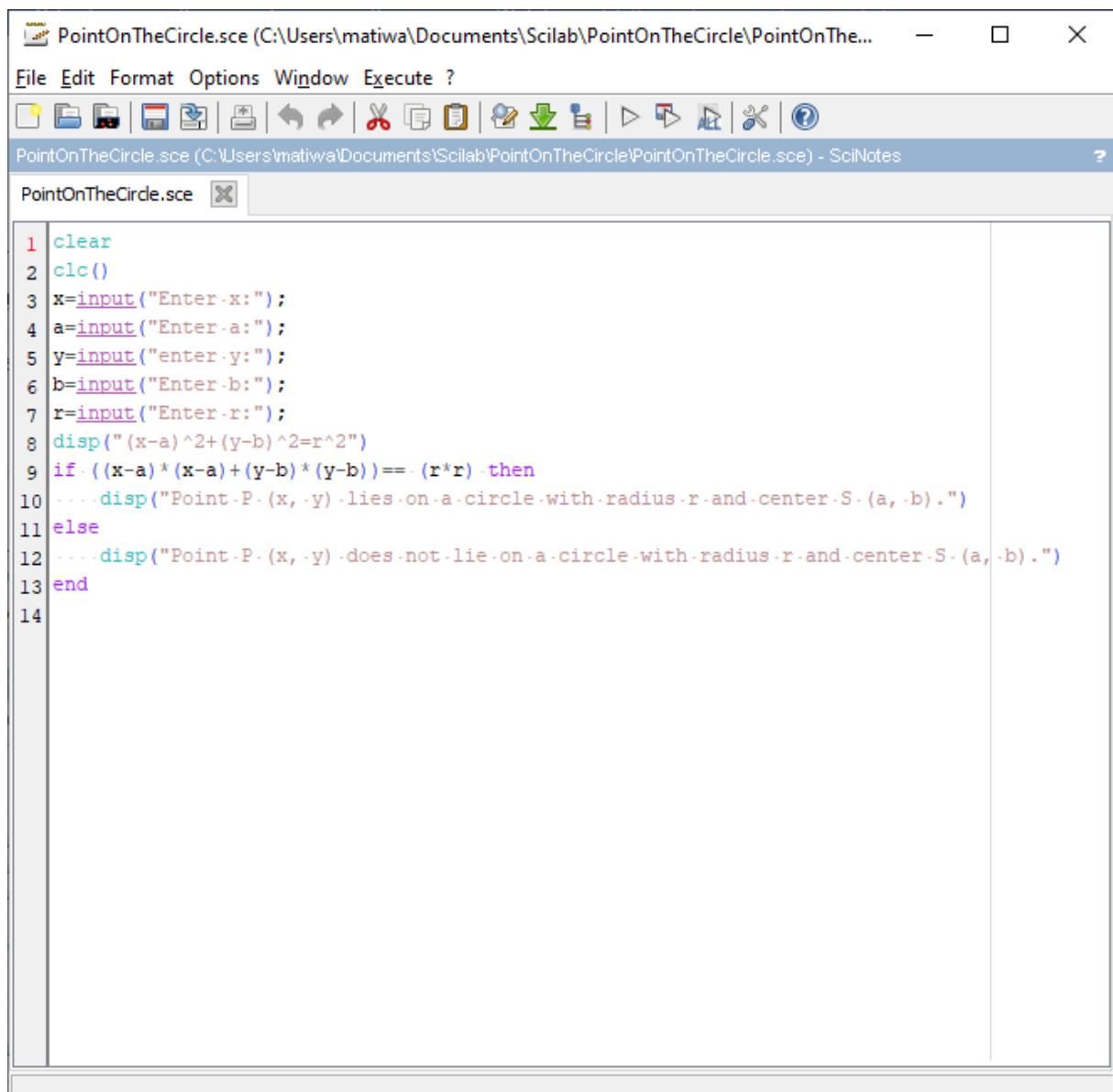
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Introduction

This Scilab script file documentation includes: description of the script operation, what is needed for use, used algorithms, description of the source code. This script checks whether a given point with coordinates P (x, y) lies on a circle with center coordinates S (a, b) and radius r.

Describing of the script's operation


```
PointOnTheCircle.sce (C:\Users\matiwa\Documents\Scilab\PointOnTheCircle\PointOnThe...

File  Edit  Format  Options  Window  Execute  ?

PointOnTheCircle.sce (C:\Users\matiwa\Documents\Scilab\PointOnTheCircle\PointOnTheCircle.sce) - SciNotes

PointOnTheCircle.sce

1  clear
2  clc()
3  x=input("Enter x:");
4  a=input("Enter a:");
5  y=input("enter y:");
6  b=input("Enter b:");
7  r=input("Enter r:");
8  disp("(x-a)^2+(y-b)^2=r^2")
9  if ((x-a)*(x-a)+(y-b)*(y-b))== (r*r) then
10     disp("Point P (x, y) lies on a circle with radius r and center S (a, b).")
11 else
12     disp("Point P (x, y) does not lie on a circle with radius r and center S (a, b).")
13 end
14
```

Drawing 1: Script content [own study]

```
Enter x:3

Enter a:-1

enter y:4

Enter b:-6

Enter r:7


 (x-a)^2+(y-b)^2=r^2

 Point P (x, y) does not lie on a circle with radius r and center S (a, b).

--> |
```

Running a script starts Scilab, then Applications and Scinotes, which is used to edit scripts. Then select on the menu bar, select Execute and Save and Execute (shortcut F5) or Save and Execute all files (shortcut Ctrl + F5).

In order to understand how the script works, it is worth following an example. We have:

x = 3, a = -1, y = 4, b = -6, r = 7

$(x-a)^2+(y-b)^2=r^2$

$(3-(-1))^2+(4-(-6))^2=7^2$

$(3+1)^2+(4+6)^2=49$

$4^2+10^2=49$

$16+100=49$

$116=49 \Rightarrow$ Contradition!

The point is not on the circle!

What is needed for use?

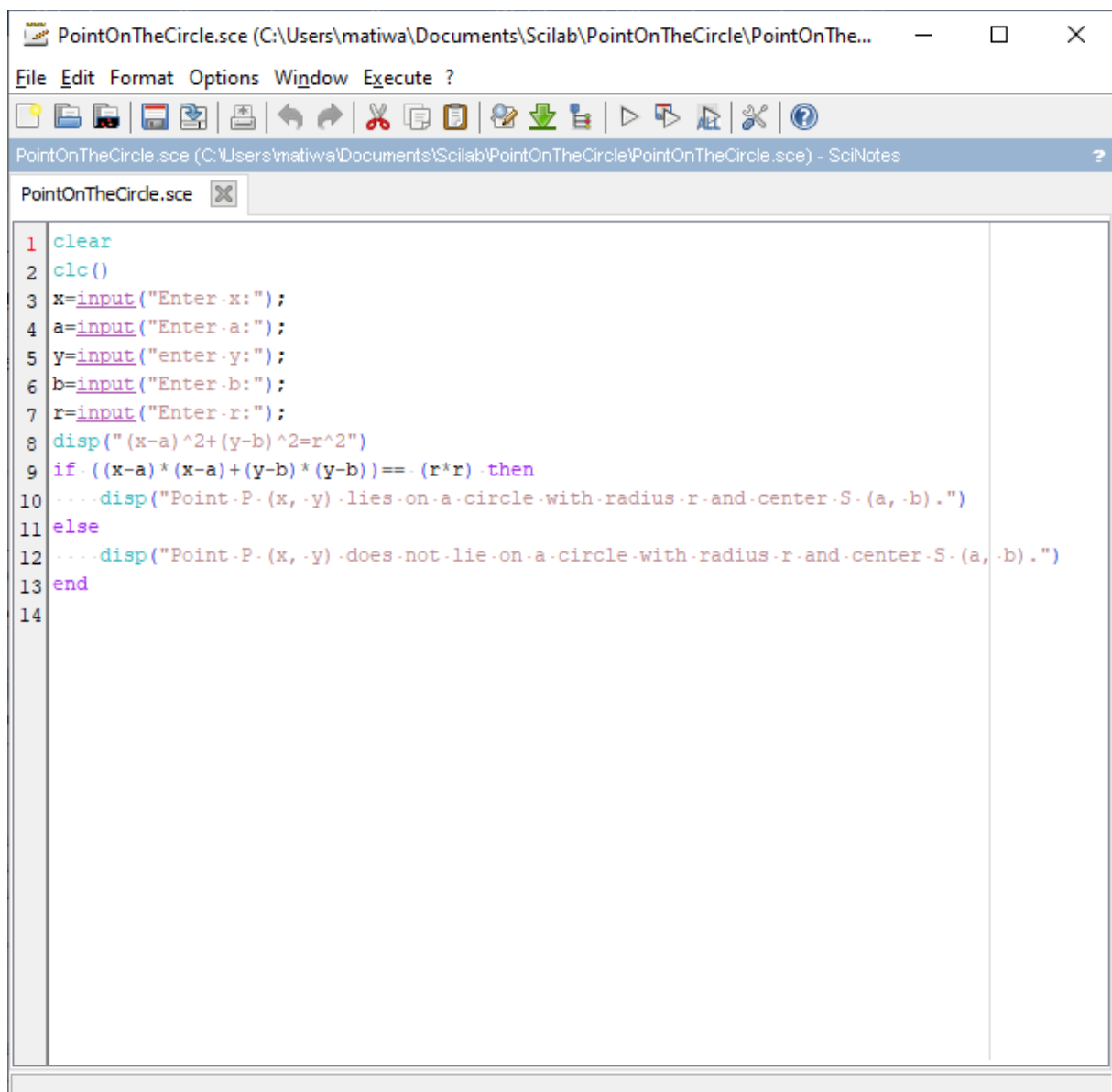The script requires Scilab and a Windows operating system.

Algorithm used

The user enters the coordinate values for the point P (x, y) and the center of the circle S (a, b), along with the value of the radius of the circle r to substitute them in the formula, i.e.:

$$(x-a)^2+(y-b)^2=r^2$$

If the left side of the equation equals the right side, the point is on a circle. Otherwise, it lies inside or outside.

Interface description

Running the code requires Scilab.

```
1  clear
2  clc()
3  x=input("Enter x:");
4  a=input("Enter a:");
5  y=input("enter y:");
6  b=input("Enter b:");
7  r=input("Enter r:");
8  disp("(x-a)^2+(y-b)^2=r^2")
9  if ((x-a)*(x-a)+(y-b)*(y-b))== (r*r) then
10     disp("Point P (x, y) lies on a circle with radius r and center S (a, b).")
11 else
12     disp("Point P (x, y) does not lie on a circle with radius r and center S (a, b).")
13 end
14
```

Drawing 3: Scilab graphical interface [own study]

Source code description

The script was made in the Scilab script language, in the Scilab 6.0.2 programming environment. All work was done on the Windows 10 operating system. The script's source code looks like this.

```
clear
clc()
x=input("Enter x:");
a=input("Enter a:");
y=input("enter y:");
b=input("Enter b:");
r=input("Enter r:");
disp("(x-a)^2+(y-b)^2=r^2")
if ((x-a)*(x-a)+(y-b)*(y-b))== (r*r) then
    disp("Point P (x, y) lies on a circle with radius r and center S (a, b).")
else
    disp("Point P (x, y) does not lie on a circle with radius r and center S (a, b).")
end
```
Listing 1: Source code [own study]

List of drawings

List of listings