Summary

1. In two dimensions

The algorithm uses a unit radius which by default is equal to 1 (we'll call this R). When a user inputs a range of radius(we'll call this r and it has to be less than 0 and greater than 1), the algorithm generates uniform random values of r using the range and it evaluates these values on R to determine if it's inside a circle. Points that are accepted are inside the circle rejected otherwise. The sum of accepted points which we'll call (df) and the sum of rejected points we'll call (dr) are used to get acceptance rate. Now, the acceptance rate for a point is calculated by

accept_rate = df / (df + dr)

The acceptance rate will help us to get the approximation of PI which then helps explain the distinguishing factor for the change in the graphical output based on the range of r. According to the algorithm. PI approximation tends to decrease as the input radius goes towards R and vise Versa. Which means the output enlargens.

2. In three dimensions

The above is also true for 3 dimensions except that r is not explicitly provided by the user but the algorithm randomly generates normal values of r using its own implicit range of r.