Particle detection

Krishna

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1 An interesting way of locating objects

The given question can be represented as a transformation of a simple one dimensional game into a 2-D space.

Let's show a demonstration of this game. Suppose there are 2 players, the first of whom will think of a number between 1 and 1024. The goal of the second player is to find the former's number, only by asking questions which have a **binary response**.

Given no limit on the number of questions to be asked, one could simply ask if every number is the right number. However, given a maximum limit on the number of questions to be asked, it makes sense to ask if the chosen number is greater than or lesser than the mean of the higher and lower limit of the range. Once this is done, the new higher or lower limit will be changed to the previous mean if the answer was lesser than or greater than respectively. For the game which has been described so far, the number of tries required to find the number cannot exceed 10.

2 Implementation and execution of the code

Sagemath has been chosen as the compiler for the following reasons:

1. Comfortable to use

2. Displaying graphs

3. Ease of recursion

First, a point is randomly generated on the x-y axis. Next, We check the location of the random point with respect to the mean point. Now, the lower/upper limit on the x and y axes are changed by the rules described above. The same process is repeated 6 times and the output graph is shown.