**Software Engineering Project2**

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**Introduction:**

In a box bounded by [-1, 1], given m balloons(they cannot overlap) with variable radius r and position mu. And some tiny blocks are in the box at given position {d};balloons cannot overlap with these blocks. find the optimal value of r and mu which maximizes sum r^2.

**Algorithm:**

The main idea of the algorithm is enumeration. Set the calculation accuracy to two decimal places. Then the possible positions of centers will be 10000. Calculate every possible position and the radius associated. Find the largest radius among them. Put the legal circles in a linked list or a max heap. Sort by the radius when putting in a new circle.

**Test Results:**

|  |  |
| --- | --- |
| Input 1 | Output 1 |
| 1  1  0 0 | 1 -0.420 -0.420 0.580 0.336400  0.336400 |

|  |  |
| --- | --- |
| Input 2 | Output 2 |
| 4  1  0 0 | 1 -0.420 -0.420 0.580 0.336400  2 0.400 0.420 0.580 0.672684  3 0.570 -0.570 0.421 0.850093  4 -0.580 0.580 0.413 1.020662  1.020662 |

|  |  |
| --- | --- |
| Input 3 | Output 3 |
| 5  4  0.1 0.1  0.3 0.3  0.5 -0.1  -0.1 0.5 | 1 -0.360 -0.360 0.640 0.409600  2 0.590 0.590 0.410 0.577618  3 -0.620 0.620 0.374 0.717419  4 0.620 -0.620 0.374 0.857220  5 -0.030 0.760 0.232 0.911230  0.911230 |

|  |  |
| --- | --- |
| Input 4 | Output 4 |
| 2  4  0.1 0.1  0.3 0.3  0.5 -0.1  -0.1 0.5 | 1 -0.360 -0.360 0.640 0.409600  2 0.590 0.590 0.410 0.577618  0.577618 |

**Appendix:**

https://github.com/yinzhenfei/SECourse