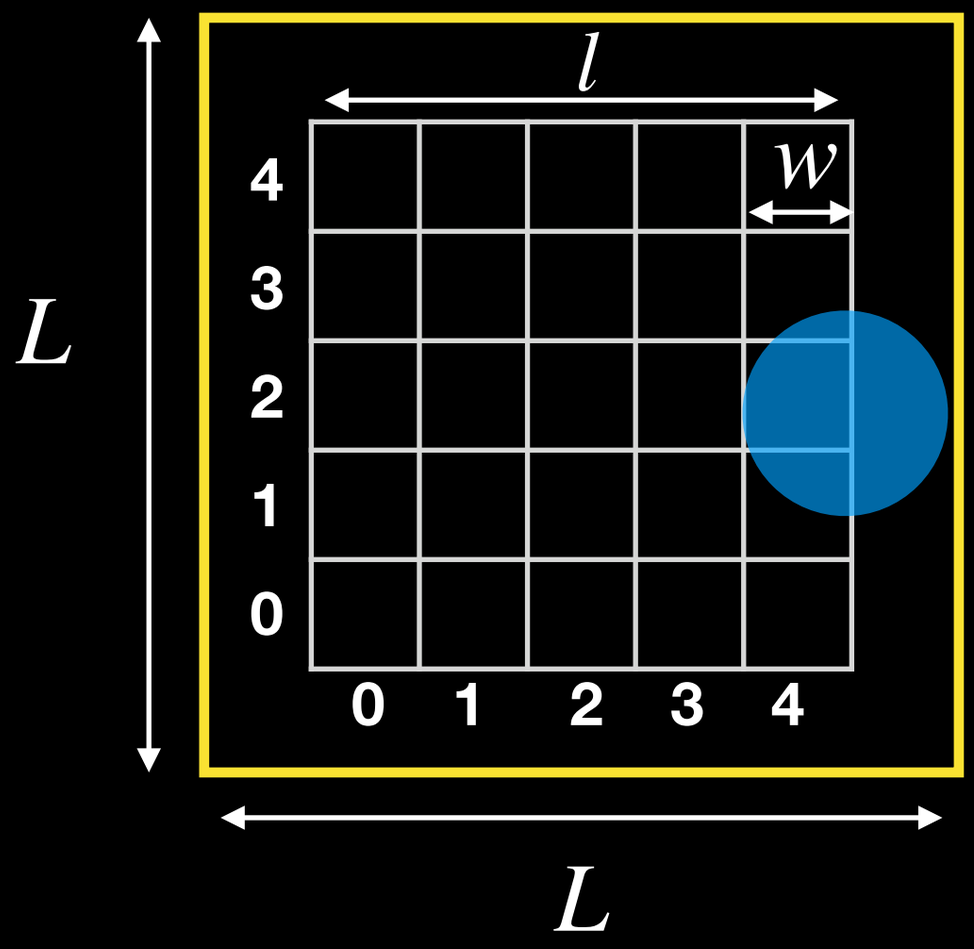
Project 4) Depletion interactions

It is a simple question with a surprising result: Do the confining walls attract particles? In particular, what is with the corners of the box?
To answer this question, you must create a two-dimensional histogram of the distribution of the particle positions. This means you must discretise the continuous space. (See also the material of lab session 2, central limit theorem, of the python course last year.)



The accessible area must be covered by a 2D grid, i.e. a two-dimensional array $H[X_i, Y_i]$.

The accessible area is $l \times l$, with $l = L - 2R$ (note the gap of the radius between the wall and the histogram).

If the dimension of the array is $N \times N$, then the width of one histogram bin is $w = l/N$.

A particle position (x_i, y_i) is associated to the indices $X_i = x_i//w$ and $Y_i = y_i//w$ of the two-dimensional histogram. Here $a//b$ is the floor division operation of python.

Does the result depend on the density ?
What happens, if you put a hand full of big particles in a bath of small particles? Are the big particles attracting each other?
Literature: http://blancopeck.net/Statistics.pdf chapter 6.1.2 The Asakura–Oosawa depletion interaction (p. 273)

Note: It is not necessary, that one and the same code does everything. You can write several codes, which do one specific measurement.