Note:
Data structure:
Most important two are the class ‘beam’ and ‘cavity’.
Class Beam has a vector of ‘bunch’ that contain 6D coordinates of all particles.
Class cavity has a a bunch of vectors (frq, V0xR, V0yR,V0zR, V0xI, V0yI,V0zI, etc.)that contain informations of interested modes. So far the code is only using one mode.

The code actually does two things:
1. Update the mode vectors in the cavity object based on the 6D coordinates of particles in the beam.
2. Update the 6D coordinates of the particles based on the cavity mode voltages, followed by linear transform caused by the ring.

Since step one needs to update the cavity info based on time coordinates of particles, I’m sorting the particles based on that and accessing the other coordinates based on the sorted index. This needs to be changed in future for sure. The plan is to bin the particles instead.

By changing ‘N’ I can change the size of vector for particle coordinates. And the most important figure of merit for me is the executing time for one “turn” tracking, which is one whole ‘beam’ finish the wake calculation and coordinates updating.