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Step 12: Build Charge System for Testing

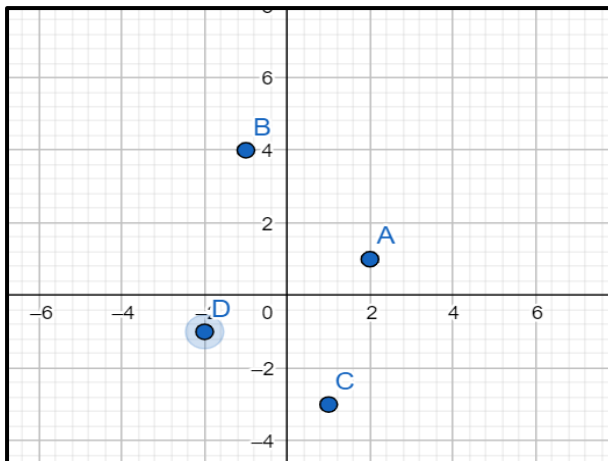


Fig 5: Charge System Built on a 2-Dimensional Plane

EXAMPLE SYSTEM:

$$A = +2Q$$

$$B = +4Q$$

$$C = -Q$$

$$D = -2Q$$

Step 13: Test functions with Test Datasets

If above procedure is followed, the system of masses / charges is built in 3 dimensions / 2 dimensions respectively with a world size which is defined by the user / programmer and the test point coordinates specified by user / programmer in order to calculate forces between the system and test point.

While running functions make sure to run new node function in the beginning with bounds of the world, then the add function iteratively adding nodes for test dataset to system and the tree calculation function before force calculation.

By maintaining this order, we have effectively computed Newtons' Gravitational Force and Coulombs' Electrical Force applied by a system of Satellites / Charges bounded in a 3 dimensional / Planar Environment on a test point.

4. REFERENCES

- [1] https://en.wikipedia.org/wiki/N-body_problem
- [2] <https://jheer.github.io/barnes-hut/>
- [3] <https://en.wikipedia.org/wiki/Quadtree>
- [4] <https://en.wikipedia.org/wiki/Octree>
- [5] <https://www.khanacademy.org/science/physics/linear-momentum/center-of-mass/a/what-is-center-of-mass>
- [6] https://en.wikipedia.org/wiki/Newton%27s_law_of_universal_gravitation