Project 5: Particle Simulation

Name _____ SID_____

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Basic requirement (50%)

- Phase 1: Interactive particle simulator
  - Generalized force structures
    - Constant force (2%) _____
    - Damping force (4%) _____
    - Spring force (4%) _____
  - Numerical Integration Schemes
    - Euler (2%) _____
    - Runge-Kutta 2 (4%) _____
    - Runge-Kutta 4 (4%) _____
  - User interface
    - Different mass value (2%) _____
    - Add, delete and edit particles (2%) _____
    - Read in / Save out initial configuration file (2%) _____
    - Visualize spring connections and forces (2%) _____
    - Save the results and replay it with correct frame rate (2%) _____
- Phase 2: Stiff Spring
  - Implicit Euler's method (10%) _____
- Phase 3: Cloth simulation
  - Mass-spring model (10%) _____

Extra credits (130%)

- Better integrators
  - Verlet integrator (5%) _____
  - Leapfrog integrator (5%) _____
  - Symplectic integrator (5%) _____
- Collisions
  - Collisions with the Walls (10%) _____
  - Collisions with other Particles (10%) _____
- Angular springs (15%) _____
- Angular constraints (20%) _____
- 3D cloth with collisions (30%) _____
- Hair with collisions (30%) _____