pbest: the best-known positions of the particles in the swarm are stored here

pbest_obj: holds the objective function values respective to the positions that are stored in pbest.

gbest: globally best solution found so far by the swarm - guides the movements of the particles towards potentially better solutions in the search space. The algorithm converges towards the optimal solution due to the updating of the gbest solution

gbest_obj: the objective function value associated with the globally best solution found by the particle swarm optimization (PSO) algorithm.

V: the velocity of a particle.

update() function: used to adjust the position and velocity of each particle in the swarm. The update function typically takes into account the current position and velocity of each particle, as well as the position and velocity of the best solution found so far by the swarm.

How PSO can be applied to entropy function:

- To optimize weights and entropy in a decision tree
    - Find the weight space for the best set of weights to minimize the entropy of the tree
- Here we would need to evaluate the quality of the solution - which is the entropy
- PSO will be applied
    - Particles initialized with random positions + velocities in search space
- With each iteration of the PSO algorithm, fitness of each particle evaluated using the fitness function.
    - Best position found for particle + best position of the whole swarm will be updated
    - Particles move accordingly respective of their new velocities
- When threshold is met, algorithm stops
- Potential result: finding better solutions than by using a standard decision tree algorithm