Task 3 – Password cracking

- Pull propagation (two queues):
  - Hint solving tasks
  - Password solving tasks

1. Master reads input completely before workers start
2. Workers start hint cracking
3. If hint queue is empty workers pull from password solving queue

Task 3 – Hint solving

- Master holds:
  - Array of all hashed hints
  - Array of solution set for each password
- Task message contains:
  - Set of characters to permutate
  - All currently unsolved hints (connected with password ids)

1. Worker creates MultiMap (multiple entries per key) of hashed hints and their corresponding password
2. Worker generates all possible permutations with the Heap's algorithm, hashes them, and checks the map for matches
3. On match: Message back to master containing solved hint and all corresponding passwords.
4. Master updates solution set and array of all hints

Task 3 – Password solving

- Task added to queue if all hints are solved or |Solution set| = 4
- Task message contains:
  - Solution set, password hash and length

1. Worker generates all 2-element subsets and their possible permutations and their hashes
   1. After each permutation, check if password was found
2. Repeat the same for all permutations of the solution set
3. As soon as password was found: Abort and send solution to master