Quiz 5 CSE 255, Spring 2017

Name: _____

PID: _____

This is the fifth quiz of CSE255/DSE230

On your desk you should have only the exam paper and writing tools. No hats or hoods allowed (unless religious items). There is one question in this quiz.

You have 10 minutes to complete the exam.

Start by writing your name and PID on this page.

Good Luck!

This problem regards the following concepts

- the K-means **cost function**, which is the average distance between each point and its closest representative.
- The K-means **problem**, which is the problem of finding the set of k representatives that minimizes the cost function.
- The K-means **algorithm** which is an algorithm for iteratively improving the cost function.
- We say that an the K-means algorithm has **converged** if the assignment of points to representatives does not change from one iteration to the next.
- **Simplifying assumption:** assume it is never the case that a point has two closest representatives. In other words there is always a unique closest representative for each point.

Mark all of the correct statements

- When using the K-means algorithm, each step before convergence is guaranteed to reduce the cost.
- K-means algortihm is guaranteed to converge.
- If the K-means algorithm converges, it found a solution to the K-means problem.
- The K-means algrithm solves the K-means problem.
- If there is a poly-time algorithm for the K-means problem, then there is a poly-time algorithm for the decision version of the travelling salesman problem.