COS126 Theory practice quiz

- The following are True/False:

  1. A Universal Turing Machine can compute anything that any other Turing Machine could possibly compute.

  2. The undecidability of the halting problem is a statement about Turing machines: it is not applicable to real computers.

  3. The Turing machine is a universal model of computation: with a Turing machine we can solve any decision problem that can be solved with a DFA or with a Pentium M running Linux.

  4. Because the Halting Problem is unsolvable, it is impossible to tell if your TSP program for your assignment has an infinite loop.

  5. If P equals NP, then the Traveling Salesperson Problem can be solved in polynomial time by a deterministic Turing Machine.

  6. If P does not equal NP, then there is no case of the Traveling Salesperson Problem for which you can find the optimal tour in polynomial time.

  7. Factoring is known to be in NP, but has not been proven to be NP-complete, so the discovery of a polynomial-time algorithm for factoring would mean that P equals NP.

  8. Factoring is known to be in NP, but has not been proven to be NP-complete, so no polynomial-time algorithm for factoring is possible.

- Match the concepts (Universal, Undecidable, Turing Machine, and Church-Turing thesis) with an item below:

  - A. A problem that cannot be solved by a Turing Machine.
  - B. One machine can do any computational task.
  - C. Anything computable in this universe can be computed by a Turing machine.
  - D. A simple, universal, model of computation.