COS126 Theory practice quiz with Answers

- The following are True/False:

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

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

  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. **T**

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

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

  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. **F**

  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. **F**

  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. **F**

- 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. **Undecidable**

  - B. One machine can do any computational task. **Univeral**

  - C. Anything computable in this universe can be computed by a Turing machine. **Church-Turing thesis**

  - D. A simple, universal, model of computation. **Turing Machine**