

Name: _____ Section: ____ Andrew Id: _____

15-110 Spring 2019 Quiz7

*** 15 minutes, No calculators, no notes, no books, no computers, no phone**

True or False (circle one)

True or False	1. The subsetSum problems asks if a list L has a sublist M such that sum(M) is 0.
True or False	2. The brute force solution to subsetSum is computable but it is exponential and thus intractable.
True or False	3. Some problems in P are intractable.
True or False	4. If $P = NP$, then subsetSum is tractable.
True or False	5. If subsetSum is in P, then all the other NP-Complete problems are also in P.
True or False	6. There are \$1M prizes for proving $P = NP$ or proving $P \neq NP$.
True or False	7. NP means "Not P" and so a problem is in NP if it is not in P.
True or False	8. A problem is not computable if it can be solved but it may take too long to practically use that solution.
True or False	9. If we had a solution to the Halting Problem, we could easily use that solution to prove Goldbach's Conjecture, even though mathematicians have been unable to prove it after centuries of trying!
True or False	10. We used diagonalization to prove there are different sizes of infinity, and we can use this same basic approach to prove the Halting Problem.

True or False	11. Because the Halting Problem is not computable, we cannot prove in general if programs work properly.
True or False	12. Even though the Halting Problem is not computable, we can prove some programs work properly.
True or False	13. A large stack of papers on a desk is an example of the LRU (least-recently-used) algorithm in practice.
True or False	14. The video on quantum computing showed how a coin can be heads or tails, but if it lands exactly on its edge then it's both heads and tails.
True or False	15. The "Death by Design" trailer we watched in class showed how self-driving cars will lead to more traffic deaths.
True or False	16. The hacking video showed that salting a password means to add a timestamp to it.
True or False	17. The 5G video made it clear that the two main advantages of 5G are that it will be much faster and that it will be much cheaper.
True or False	18. The AI video used an analogy about an alien civilization saying that they will arrive on our planet in 50 years, and we should get ready, noting that we should feel more urgency than we do about how AI is soon to become smarter than us.
True or False	19. The point of Stephen Colbert's video is that our nation's nuclear arsenal and other important systems are running on programs that we cannot prove work properly.
True or False	20. The point of Andrew Norelli's video is that HCI, usability, and design really matter and very often technical products that are meant to help us instead are hopelessly and senselessly complicated and confusing.

21. Bonus / Optional [5 pts]: Write the function `doesTheOpposite` that we used in proving the Halting Problem.