

1. About verification:

I found many of you didn't do verification in Q3 and Q4. Remember that after you construct a TM to decide a language or to implement some operations, you should verify that the TM you build indeed outputs the results as you claimed. Even though you may think the verification is obvious, you should write one or two sentences to verify the correctness of the TM and make your answers complete. You can refer to the examples in Lecture 20, the solutions of HW3's Q3 and Q4, Solution9 of Tutorials to see how to verify.

2. About Q4:

Many of you misunderstand the problem. Take b) for example.

The problem is "Given a deterministic Turing machine M , does there exist a string w such that M accepts w in at least 10 steps?"

But many think the problem is "Given a deterministic Turing machine M and a string w , does M accepts w in at least 10 steps?"

Notice that the two problems are different. The first one corresponds to $\{M: M \text{ accepts } w \text{ in at least 10 steps, } \exists w\}$, while the second one corresponds to $\{M, w: M \text{ accepts } w \text{ in at least 10 steps.}\}$

So if we assume that the problem is decidable, and Turing machine M_{10} decides it, then the input for M_{10} is just " M " instead of " M " " w ". And the problem can be reduced from the non-Empty problem instead of the halting problem.