

## *Solutions For Turing Machine Problems Peter Linz*

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### **Solutions For Turing Machine Problems**

)Church-Turing Thesis: “The intuitive notion of algorithms equals Turing machine algorithms”  
¼Turing machines serve as a precise formal model for the intuitive notion of an algorithm)“Any computation on a digital computer is equivalent to computation in a Turing machine” Dude, that’s pretty deep...

### **Solving Problems with Turing Machines**

Solutions to Problem Set 4 1. (Sipser, Problem 3.13) A Turing machine with stay put instead of left is similar to an ordinary Turing machine, but the transition function has the form  $\delta : Q \times T \rightarrow Q \times T \times \{R, S\}$  At each point the machine can move its head right or let it stay in the same position. Show

### **Solutions to Problem Set 4 - EECS at UC Berkeley**

vii. Church-Turing Thesis Answer: The informal notion of algorithm corresponds exactly to a Turing machine that always halts (i.e., a decider). viii. Turing-decidable language Answer: A language  $A$  that is decided by a Turing machine; i.e., there is a Turing machine  $M$  such that  $M$  halts and accepts on any input  $w \in A$ , and  $M$  halts and rejects on ...

### **PracticeProblemsforFinalExam: Solutions CS341 ...**

43-Turing machine problem Palindrome. 43-Turing machine problem Palindrome. Skip navigation Sign in. ... 45-Subtraction problem of Turing Machine - Duration: 13:26. deeba kannan 78,721 views.

### **43-Turing machine problem Palindrome**

CS103 HW7: Solutions Problem 1 (20 points) Let  $\Sigma = \{0,1\}$ . Draw the state transition diagram for a Turing machine whose language is  $L = \{w \in \Sigma^* \mid w \text{ contains } 01 \text{ as a substring}\}$ . Solution This Turing machine mimics the DFA for the same language, moving the tape head one step to the right at each step.

### **CS103 HW7: Solutions - Stanford CS Theory**

Element distinctness problem Given a list of strings over  $\Sigma$  separated by  $\#$ , determine if all strings are different. A TM that solves this problem accepts the language Examples of Turing Machines - p.19/22

### **Examples of Turing Machines - ics.uci.edu**

- Turing Machines (1936) - Post Systems (1936) ... algorithmic solution can be solved by a Turing Machine ! ... we can develop some programming techniques for TM's, allowing us to write machines for more and more complicated problems. Structuring states and tape symbols is particularly useful. Then, there is a possibility to use one TM as a

### **Turing Machines - Computer Action Team**

3515ICT Theory of Computation Turing Machines ... • Algorithms and the Church-Turing thesis (3.3) • Decidable problems (4.1) • The Halting Problem and other undecidable problems (4.2) • Undecidable problems from language theory (5.1) • The Post Correspondence Problem and its applications (5.2)

### **3515ICT Theory of Computation Turing Machines**

Every decider is a Turing machine, but not every Turing machine is a decider. Thus  $R \subseteq RE$ . Hugely important theoretical question:  $R \stackrel{?}{=} RE$  That is, if you can just confirm “yes” answers to a problem, can you necessarily solve that problem?

### **Turing Machines - Stanford University**

Solutions for Homework Six, CSE 355 1. (8.1, 10 points) Let  $M$  be the Turing machine defined by ... (8.5, 10 points) Construct a Turing machine with input alphabet  $\{a,b\}$  to accept each of the following languages by final state. ... 10 points) Modify your solution to Exercise 5(a) to obtain a Turing machine that accepts the language  $\{a^i b^j \mid i \leq j\}$  ...

### **Solutions for Homework Six, CSE 355 1. 8.1, 10 points**

Background. The halting problem is a decision problem about properties of computer programs on a fixed Turing-complete model of computation, i.e., all programs that can be written in some given programming language that is general enough to be equivalent to a Turing machine. The problem is to determine, given a program and an input to the program, whether the program will eventually halt when ...

### **Halting problem - Wikipedia**

118 Solutions to Exercises Solutions for Chapter 1 (1.2.1) Yes. Examining the sequence of configurations followed by  $M$  when the initial configuration is  $(A, q_0, v)$ , we can determine the rightmost cell  $c$  visited by  $M$  before it halts. We can then check whether there are

### **Solutions to Exercises - Home - Springer**

2. Exercise 8.2.3: Design a Turing machine that takes as input a number  $N$  and adds 1 to it in binary. To be precise, the tape initially contains a  $\$$  followed by  $N$  in binary. The tape head is initially scanning the  $\$$  in state  $q_0$ . Your TM should halt with  $N + 1$ , in binary, on its tape, scanning the leftmost symbol of  $N + 1$ , in state  $q_f$ . You may

### **CS 281 - Homework 1 Solutions Exercise 8.2.2: Design ...**

Prelim 2 Solutions November 12, 2006 Problem 1 ... need to be written separately for each  $X_1$  in the alphabet of the Turing machine. Problem 4 Prove that the Halting problem is undecidable. 3. Solution 4 We recall the definition of the halting problem (language) which is denoted by  $HP$ . It is the set of all tuples  $(M, w)$  such that  $M$  halts on the ...

### **Problem 1 Solution 1 - Cornell University**

turing machine homework solutions cd4164fbc1 you need hints to find a solution or that you simply need the answer. (a deterministic Turing machine) checks it is correct. 8 discrete mathematics homework 3.. a formal description of your Turing machine in terms of. please also electronically submit your solution.

### **Turing Machine Homework Solution | titaljo**

A Turing machine is an abstract computational model that performs computations by reading and writing to an infinite tape. Turing machines provide a powerful computational model for solving problems in computer science and testing the limits of computation — are there problems that we simply cannot solve? Turing machines are similar to finite automata/finite state machines but have the ...

### **Turing Machines | Brilliant Math & Science Wiki**

Exercise Sheet 6 Due: 11th December 2014 Exercise 6.1 (Turing Machines) (a) Design a Turing Machine that decides the language  $L := \{0^n 1^n \mid n \geq 1\}$ . Explain your choice. Solution: Alternately, the TM will change a 0 to an X and then a 1 to a Y until all 00s and 10s have been matched.

### **Exercise Sheet 6 - Herzlich Willkommen!**

Computability: Turing Machines and the Halting Problem Jeremy Booyer July 9, 2008 1 Effective Computability and Turing Machines In Hilbert's address to the International Congress of Mathematicians, he posed the problem of devising a method to check whether a polynomial equation possessed any integral solutions.

### **Computability: Turing Machines and the Halting Problem**

Input — A Turing machine and an input string  $w$ . Problem — Does the Turing machine finish computing of the string  $w$  in a finite number of steps? The answer must be either yes or no. Proof — At first, we will assume that such a Turing machine exists to solve this problem and then we will show it ...

### **Turing Machine Halting Problem - Tutorials Point**

Practice problems for the Final I. Problem 37.1. Design a Turing Machine to recognize palindromes. Problem 37.2. Design a Turing Machine to compute  $f(n) = 2n$ . Problem 37.3. Which of the following problems is decidable? Why? a) Given a TM  $M$  and a string  $y$ , does  $M$  ever write the symbol  $]$  on its tape on input  $y$ ?

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