University of Virginia cs1120: Introduction of Computing Explorations in Language, Logic, and Machines

Quiz 2

Your name:	Your UVa Email ID:			

Honor policy: For this quiz, you must work alone, and may not uses any resources other than your own brain and body, the pencil or pen you use to write your answers, and this sheet of paper.

- 1. The purpose of Charles Babbage's *Difference Engine* (his first major machine described in Chapter 4 of *The Information*) was to: (check the **one best answer**):
 - ____ Solve Differential Equations, useful for computing ballistic tables
 - ___ Generate Logarithmic Tables, important for calculations needed to navigate ships
 - ___ Generate Odds Tables, for use in horse racing betting
 - ___ Generate Taxation Tables, important for the Treasury to collect revenues
- 2. According to Chapter 4 of *The Information*, August Ada Byron King: (*check all that are true*)
 - ___ Was a mathematical prodigy who studied Euclid in her youth
 - ___ Was obsessed with a pegboard puzzle game (similar to the one described at the end of Chapter 5 of the course book)
 - ___ Wrote the first published computer program
 - ____ Found programming to be easy and effortless
 - ___ Devised a recursive algorithm to compute Bernoulli numbers
- 3. According to the Problem Set 1 Comments, the first "scientific" thing a kindergartner learns in school is: (check *one*)
 - ___ Gravity makes you fall
 - ____ The primary colors are red, blue, and green
 - ___ How to add by counting
 - ___ A lie
- 4. Chapter 6 of the course book explains how to perform simple logical operations using: (circle one)

Beer	Cells	Electricity	Tinker Toys	Water	Wine
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5. According to Chapter 6 of the course book, what are the three things we need to model to model a computer?

This is the end of the graded part of the quiz. If you have more time, go on to the **ungraded** questions on the back. 6. (ungraded) What one change would most improve the course?

7. (ungraded) What is a *List*?

8. (ungraded) Define a procedure, **xor**, that computes the exclusive or of two inputs (i.e., **(xor a b)** is true if either a or b is true but not both), using only **and** and **not**.

9. (ungraded) Devise logical expressions for computing the output bits for an adder that takes as inputs three single bits, **a**, **b**, and **c**. Since the maximum sum is 3, there should be two output bits, **r**₁ and **r**₂.