Computer Design Supervision 3

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The halting problem is the question of whether it it possible to create a machine, or an algorithm, which will *always* decide whether any program will terminate on any given input. It has been established by computation theroy that it is not possible.

The configuration of a 2 register machine at any point consist of the values of the 2 registers, the program it is running, and the current label we are executing at.

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When using a register machine, you give it a list of commands. These commands consist of an operation, a register, and one or 2 labels. Possible operations are increment register, and jump to label, or {register == 0, jump to label 1 — register ¿ 0, decrement register and jump to label }. This will continue until a special HALT instruction is reached, and the result can be read from the registers.

The current configuration is a function of the program, the current values in the registers and the contents of all the registers.

The given register machine set a to 0, then exits if s is 0, otherwise copy s into$z$. It then prcoceeds to repeatedly divide z by 2 into s, exiting if z is odd, otherwise incrementing a, and copying z into s again. This terminates with the number of times 2 divides into z in a.

will look the rest up