Chapter Two Notes –

Computers are anything that can process data, be it human or machine.

Computers:
Computers Used to Be a job title. A computer would be someone who computes stuff for others. That might be just number crunching or something else.

Turing Machines are Computers that can solve any mathematically computable question. They were originally conceptualized to use tape with symbols (or holes?) that would be moved underneath a sensor that would read, write in, or delete the symbols.

I wonder if these symbols needed to only be in two states. Could we have three states? Would the three states look like this 0, 1, 2. Or like this -1, 0, 1. What would this benefit? Negative numbers would be easier to express in the last one, cause -10 would be -3 instead of, I don't know what.

Which brings up the question, how do you add (and subtract) bits. I know it must be a logic gate combination of some kind. But what!

Let's think. It must be a something with multiple logic gates (anything 1 + 1 higher is needed multiple bits to express), and since it has to be the same circuit for adding everything it must be recursive in on itself and not leave un-needed leftover if a non-filling to all the inputs amount is entered.

Well, speed and ease of use vary, every computer is no more capable than a Turing machine when it comes to what they can do.

Bits and Coding:
Elements and data represented using High/On bits and Low/Off bits.

Computers are pre-coded to be capable of basic things to make it easier for those using them.

Alice, Scratch, and other graphical languages are not Turing complete. Most traditional ones, such as python, are.

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Computers can receive data as input.

Computers can store data.

Computers can process data (by computing with it).

Computers can send data as output.

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-Chapter Two of the Textbook

Key Points of the Chapter in My Own Words:
Bits are written as 1 & 0, On & Off, True & False, or High & Low.
Computers process inputs and give outputs.
Programs are coded instructions for a computer to tell it how to make the output from the data.
Programming languages are a format with specific syntax and grammar for writing code.
Programming Tools are IDEs or tools for writing code on for example Replit.
Turing machines are machines that can solve anything that is mathematically computable.