Moore’s Law:

* A prediction that transistor density would double every two years.
* It is not a physical law, just an observation
* Smaller transistors switch faster
* An exponential increase in density would lead to an exponential increase in speed

Moore’s Law has stopped being true due to the “power wall” attributed to the following physical limitations:

1. Power consumption problem
   1. Transistor consume power when they switch
   2. Increasing transistor density means increased power consumption, even though smaller transistors use less power, the density scaling is faster
   3. The high power consumption leads to high temperatures
   4. Air cooled CPUs can only remove so much heat.
2. Dennard scaling problem
   1. Voltage should scale with transistor size
   2. Keeps power consumption, and therefore temperature, low
   3. Voltage cannot go too low, however.
      1. Must stay above the transistor threshold voltage
      2. Noise problems occur
   4. Leakage power is also a problem.
   5. Dennard scaling must stop.