Muhammad Khevin Utama,

19 September 2023, Indonesia.

Week 1 Peer Graded Assignment (Moore’s Law)

About Moore’s Law

Moore’s law is the observation that the number of transistors in a dense integrated circuit doubles about every two years. This law – which is more an observation and projection of a historical trend – is named after George Moore, the co-founder of Fairchild Semiconductor and CEO and co-founder of Intel, who in 1965 posited a doubling every year in the number of components per integrated circuit, and projected this rate of growth would continue for at least another decade. As said, rather than a law of physics, it is an empirical relationship linked to gains from experience in production.

Although the rate held steady from 1975 until around 2012, it was faster during the first decade. In general, it is not logically sound to extrapolate from the historical growth rate into the indefinite future. For instance, the 2010 update to the *International Technology Roadmap for Semiconductors* predicted that growth would slow around 2013, and in 2015 the same Gordon Moore foresaw that the rate of progress would reach saturation.

From the explanation of Moore’s Law, I conclude that Moore’s Law cannot be relevant anymore for decades, which is:

1. Smaller transistors switch faster, increasing power demand.
2. Transistor’s need a minimum voltage to switch, and voltage reduction has lower limits.
3. An exponential increase in density would lead to exponential increase in speed
4. Voltage scaling does not prevent power leakage.
5. As transistors increase, power demand increases, which increases heat.
6. Dynamic power consumption is reduced by voltage scaling.

Moore’s law is only true at a very specific moment in time. A good programmer should not base the good performances of its software only, but it should be good to know the capabilities of hardware capacity, but it doesn’t necessarily mean mapping which tasks were executed to which core or else just telling which tasks can be run concurrently.