<p align="center"># COURSECODE Cheatsheet</p>

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> **Terminology: Interest Rate**
> 1. P: Principle amount
> 2. F: Future amount
> 3. F_N: Future amount in (time unit) N
> 4. N: Number of periods (e.g. years)
> 5. i: Interest rate
> 6. I: Total interest amount
> 7. r Nominal interest rate (usually for 1 year)
> 8. m: Number of times compounded (subperiods) per year
> 9. i_s: Subperiod interest rate
> 10. i_e: Effective interest rate, the equivalent rate if compounded only once per year.

Definition: Interest Rate

$$i = \frac{I}{P} \tag{1}$$

Definition: Subperiod Interest Rate

$$i_s = \frac{r}{m} \tag{2}$$

Definition: Effective Interest Rate

$$i_e = (1 + i_s)^m - 1 \tag{3}$$

Definition: Simple Interest

$$F_N = P(1 + Ni) \tag{4}$$

Definition: Compound Interest

$$F_N = P(1 + i)^N \tag{5}$$

Definition: Compound Interest with Subperiods

$$F_N = P(1 + i_s)^{Nm} \tag{6}$$

> **Definition: Continuous Compound Interest** The finite amount of i_e as the compounding period becomes infinitesimally small.
> $$i_e = \lim_{m \to \infty} (1 + \frac{r}{m})^m - 1 = e^r - 1 \tag{7}$$
> **Note:** i_e increases as the compounding period decreases.

2 Week 2

3 Week 3

4 Week 4

5 Week 5

6 Week 6

7 Week 7

8 Week 8

9 Week 9

10 Week 10

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13 Week 13

> **Process:**
>   1.
>   2.
>   3.
>   4.

> **Example:** Hanhee Lee

> **Definition:**

> **Theorem:** Hanhee Lee

> **Derivation:** Hanhee Lee

> **Intuition:** Hanhee Lee
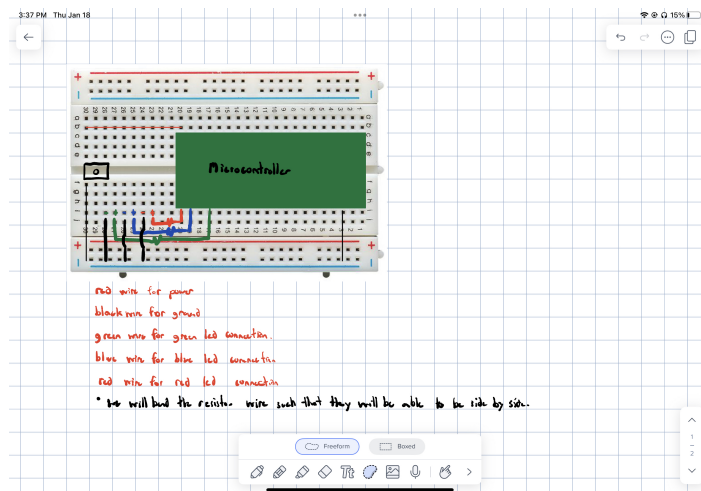
> **Warning:** Hanhee Lee

Hanhee Lee

Figure 1: ESC195