

EEE104

Circuit Analysis I

Ankara University

Faculty of Engineering

Electrical and Electronics Engineering Department

Mutual Inductance

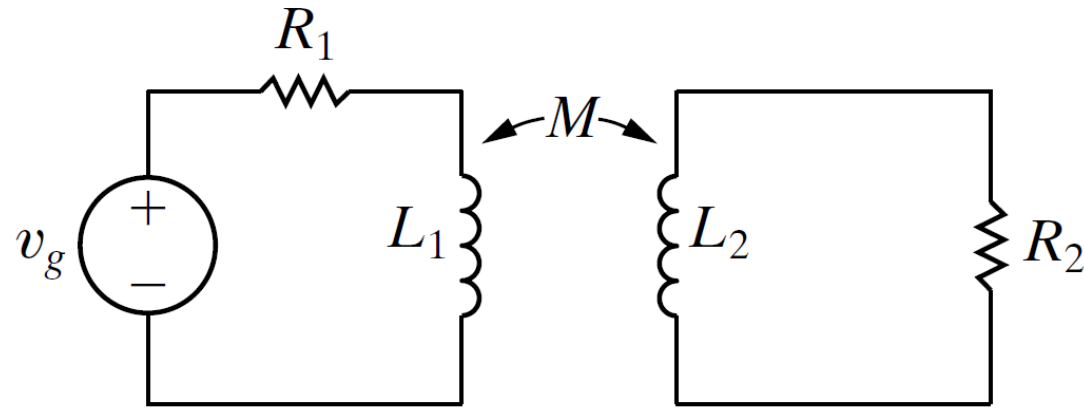
EEE104 Circuit Analysis I

Lecture 9

Agenda

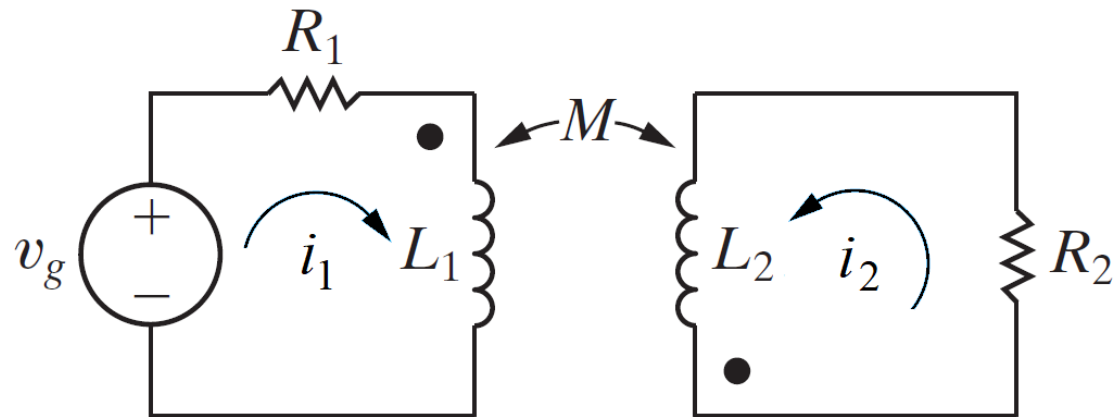
- Mutual Inductance

Mutual Inductance



M : Mutual Inductance

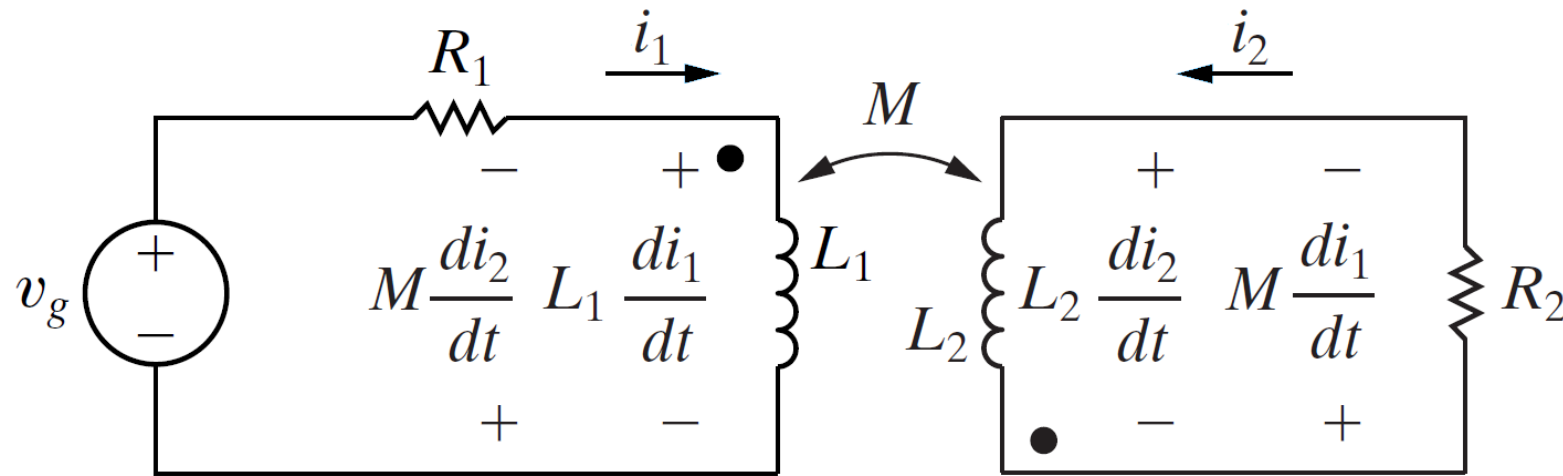
Mutual Inductance



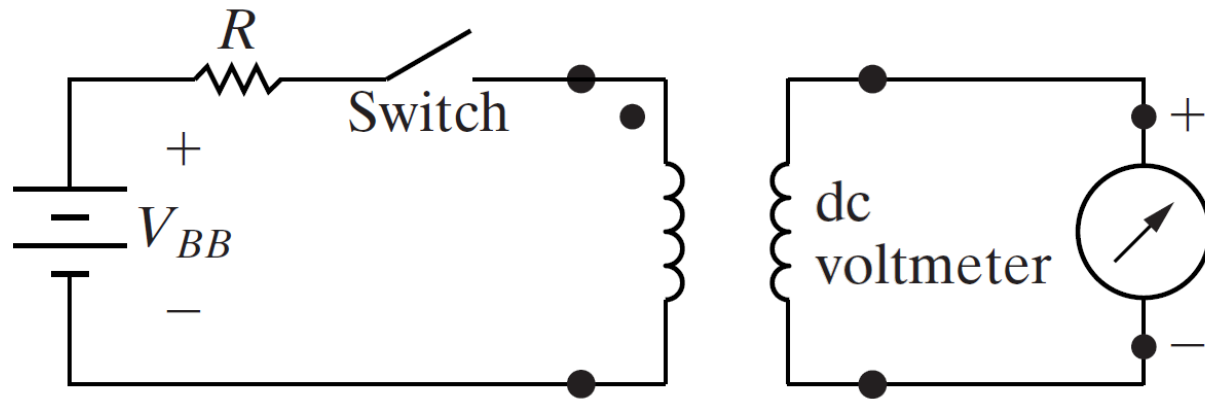
- Dot Convention

When a current enters the coil's terminal with dot, the reference polarity of the voltage that it induces in the other coil is positive at its terminal with dot.

Mutual Inductance



Mutual Inductance



Determining polarity marks experimentally

Mutual Inductance

- Mutual Inductance in Terms of Self Inductance

$$M = k\sqrt{L_1L_2}$$

k : Coupling coefficient

$$0 \leq k \leq 1$$

Reference

- Electric Circuits, Tenth Edition, James W. Nilsson, Susan A. Riedel
Pearson, 2015