EECS 16B CSM

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Computer Science Mentors

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Who am I?

- 3nd year majoring in EECS
- took EECS 16B Spring 2020
- Pertinent fact: watches too much AoT

Who are you?

- Name
- Pronouns
- Year/Major
- Pertinent fact

Logistics

- 2 unexcused absences during the semester
- excused absences: email bryanngo@berkeley.edu & cc mentors@berkeley.edu with subject line `[Request for Absence] <course>`
- Slides available at `https://github.com/bdngo/16b-csm`

Expectations

Me to You

- Be skeptical
- Constant feedback
- Become passionate about 16B

Expectations

You to Me

Differential Equations

Differential Equations

Concept check!

Differential Equations

Concept check!

$$\frac{d}{dt}x(t) = f(x,t) \tag{1}$$

- Focusing on first-order ODEs
- Relates the derivative in other terms
- 3Blue1Brown video

Exponential Differential Equation

Homogeneous

$$\frac{d}{dt}x(t) = \lambda x(t) \implies x(t) = x_0 e^{\lambda t} \tag{2}$$

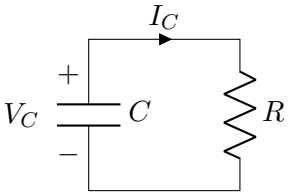
Exponential Differential Equation

Non-Homogeneous

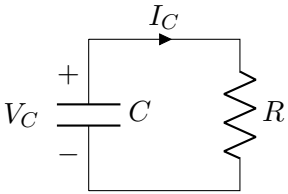
$$\frac{d}{dt}x(t) = \alpha x(t) + \beta \tag{3}$$

RC Circuits

Undamped Impulse Response



Undamped Impulse Response



$$C\frac{d}{dt}V_C = -\frac{V_C}{R} \tag{4}$$

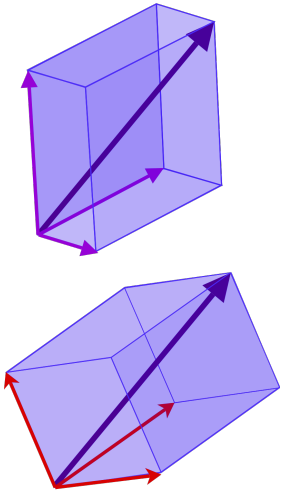
$$\frac{d}{dt}V_C = \underbrace{-\frac{1}{RC}}_{\lambda} V_C \tag{5}$$

$$\Rightarrow V_C(t) = V_0 e^{-\frac{1}{RC}t} = V_0 e^{-\frac{1}{\tau}t} \tag{6}$$

Change of Basis

Motivation

- conversion from one linear coordinate system to another
- 3Blue1Brown video



A Visualization