CEE M20 Lab Week 1

Yuhai Li

About me

- First-year PhD
- Research interests: Machine Learning in Material Science, Peridynamics, Simulation
- www.yuhaili.com

About Lab

- 10am - 11:50am @ Fridays
- Focus on homework assignments
- Schedule
  - Knowledge Review (10 mins)
  - Homework (40 mins)
  - Break (10 mins)
  - Deep Dive (optional) (< 10 mins)
  - Q & A (>40 mins)
- Raise hand when you have questions

About Office Hour

- 4pm - 6pm @Thursdays or by appointments
- Don’t ask for debugging
  - Bad Question: “My code doesn’t work.”
  - Good Question: “I got an error AAA from Bth line. I googled and CCC website/blog/post suggested a solution DDD. I tried it and the error still exists/it popped up a new error. I think it was because EEE, but I don’t understand why it doesn’t work.”
- Put questions in the shared google docs
  - Don’t copy and paste your entire script
- Priority of where to ask questions
  - Discussion Forum -> Office Hours -> Tutoring -> Emails

About Homework

- Due 11:59pm @Fridays
- 20% penalty for late submission within 24 hours.
- No excuse
  - “My network is not good.”
  - “My dog ate my computer.”
- Plagiarism
  - You may discuss but are not allowed to copy code and reports
  - Suspend from school for one quarter; dismissal
  - Don’t share your work to the others

MATLAB Review

Find Helps

- Help
- Lookfor
- GOOGLE!!!
- Ask TAs

Arithmetic Operations

- 1.5 + 4
- 9 / 2
- 22 * 4.6

Arithmetic Operations

- 1.5 + 4
- 9 / 2
- 22 * 4.6
- 3 / 0 ???

Arithmetic Operations

- 1.5 + 4
- 9 / 2
- 22 * 4.6
- 3 / 0
- Inf / 4 ???

Arithmetic Operations

- 1.5 + 4
- 9 / 2
- 22 * 4.6
- 3 / 0
- Inf / 4
- Inf - Inf ???

Arithmetic Operations

- 1.5 + 4
- 9 / 2
- 22 * 4.6
- 3 / 0
- Inf / 4
- Inf - Inf
- Inf / Inf ???

Arithmetic Operations

- 1.5 + 4
- 9 / 2
- 22 * 4.6
- 3 / 0
- Inf / 4
- Inf - Inf
- Inf / Inf ???

Arithmetic Operations

- Precedence
  - ()
  - ^
  - *, /
  - +, -

Arithmetic Operations

- 1 + 2 * 3
- 2 ^ 2 + 4
- 2 ^ (2 + 4)
- 2 ^ 3 * 6 == 6 * 2 ^ 3 ??

Function Calls

- sin(pi)
- cos(0)

I/O

- firstName = input(“please enter your first name:”)
- fprintf()
  - ‘%s’
  - ‘%d’ or ‘%i’
  - ‘%f’
    - ‘%10f’
    - ‘%.6f’
  - ‘%e’
  - ‘\n’
  - ‘\t’

Homework

Question 1 - Oblate spheroid

$$A(r_1, r_2) = 2\pi \left\{ r_1^2 + \frac{r_2^2}{\sin \gamma} \ln \left(\frac{\cos \gamma}{1 - \sin \gamma} \right) \right\}$$

where r_1 is the equatorial radius, r_2 is the polar radius, and $\gamma = \arccos(r_2/r_1)$.

Question 1

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where r_1 is the equatorial radius, r_2 is the polar radius, and $\gamma = \arccos(r_2/r_1)$.

- Input?
- Output?

Question 1

$$A(r_1, r_2) = 2\pi \left\{ r_1^2 + \frac{r_2^2}{\sin \gamma} \ln \left(\frac{\cos \gamma}{1 - \sin \gamma} \right) \right\}$$

where r_1 is the equatorial radius, r_2 is the polar radius, and $\gamma = \arccos(r_2/r_1)$.

- Input? r1, r2
- Output? A

Question 2 - Ellipse perimeter

$$P_1 = \pi(a+b) \qquad P_5 = \pi(a+b)\left(1+\frac{3h}{10+\sqrt{4-3h}}\right)$$
$$P_2 = \pi\sqrt{2(a^2+b^2)} \qquad P_6 = \pi(a+b)\frac{64-3h^2}{64-16h}$$
$$P_3 = \pi\sqrt{2(a^2+b^2)-\frac{(a-b)^2}{2}} \qquad P_7 = \pi(a+b)\frac{256-48h-21h^2}{256-112h+3h^2}$$
$$P_4 = \pi(a+b)\left(1+\frac{h}{8}\right)^2 \qquad P_8 = \pi(a+b)\left(\frac{3-\sqrt{1-h}}{2}\right).$$

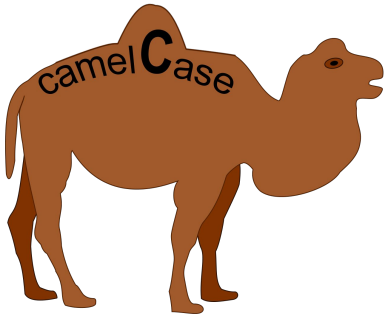
Here,

$$h = \left(\frac{a-b}{a+b}\right)^2$$

BREAK

Deep Dive (Camel Case)

Naming Convention



camelCase

kebab-case

snake_case

Camel Case

- firstName = input(“please enter your first name:”)
- iPhone
- eBay

Q&A

https://docs.google.com/document/d/1YlvHvI-H7w9-TAyvxysQAQBSVikCQ1l4YzvWJkLiAx8/edit