

CSE VLC Session 5

Flipped Classroom and Peer Instruction

Homework Assignment

Instructions: Post to Session 5 folder of our web portal

Due: Monday at Noon, November 25th

Course Title

Models I

MATLAB® will be introduced and progressively developed as a programming tool to enable students to explore engineering concepts, to investigate solutions to problems too complex for hand solutions, and to develop an appreciation of the power and limitations of computer tools. Special attention will be given to graphical visualization of concepts and to numerical approximation techniques and the errors associated with approximations.

Flipped Classroom

A Flipped Classroom is a pedagogical approach where students acquire knowledge before coming to class and engage in activities during class. Have you tried a flipped classroom? If so, please share the following in your homework assignment.

- 1) What do students do to prepare outside of class? Videos? Reading assignments? Homework exercises? [Videos](#)
- 2) What do you have students do inside of class instead of lecture? [Short quiz on videos at the beginning of class. Work on a problem that involves writing code using concepts introduced in the videos.](#)
- 3) Provide 1-2 resources would you recommend for a professor considering this approach?

Peer Instruction

Peer Instruction is a pedagogical approach where students spend much of the class time responding to multiple-choice questions and discussing answers in groups of 2-4.

In preparation for our next virtual meeting:

Read:

Simon et. al. 2010. Experience Report: Peer Instruction in Introductory Computing. *Proceedings of SIGCSE Symposium*.

Crouch & Mazur. Peer Instruction: Ten years of experience and results. *American Journal of Physics*. 69 (9), September 2001.

Watch:

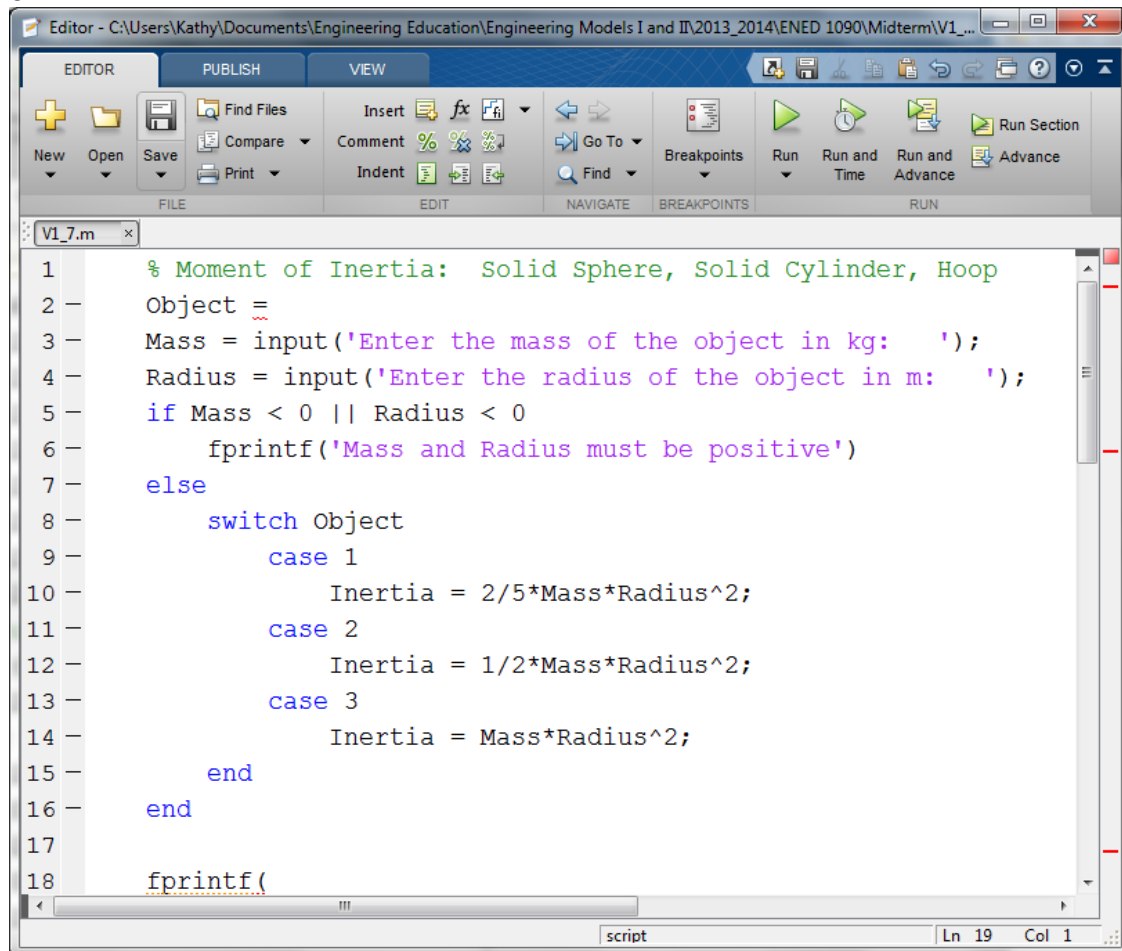
There are many good videos posted by the Carl Wieman Science Education Initiative http://www.cwsei.ubc.ca/resources/SEI_video.html

In particular:

- Student and Teachers Speak about Clickers
- How to use Clickers Effectively
- Anatomy of a Clicker Question

Write:

Create three clicker questions for your course that include appropriate distracters (wrong answers) and that are not too easy or too hard for students to do on their own.



```
1 % Moment of Inertia: Solid Sphere, Solid Cylinder, Hoop
2 Object =
3 Mass = input('Enter the mass of the object in kg: ');
4 Radius = input('Enter the radius of the object in m: ');
5 if Mass < 0 || Radius < 0
6     fprintf('Mass and Radius must be positive')
7 else
8     switch Object
9         case 1
10            Inertia = 2/5*Mass*Radius^2;
11        case 2
12            Inertia = 1/2*Mass*Radius^2;
13        case 3
14            Inertia = Mass*Radius^2;
15    end
16 end
17
18 fprintf(
```

1. There are several ways we could ask the user of the above program to enter the object for which they wish to calculate the moment of inertia. Which of the following types of statements could be used in line 2 to complete it correctly, given that a switch statement is used in lines 8 to 15?
 - a. input statement
 - b. fprintf statement
 - c. menu statement
 - d. disp statement

2. Which of the following lines of code complete line 18 correctly and display moment of inertia with 2 places behind the decimal point and also show appropriate units?
 - a. `disp('Moment of Inertia = %0.2f kg m^2 \n',Inertia);`
 - b. `fprintf('Moment of Inertia = %0.2f kg m^2 \n',Inertia);`
 - c. `disp('Moment of Inertia = %2f kg m^2 \n',Inertia);`
 - d. `fprintf('Moment of Inertia = %0.2 kg m^2 \n',Inertia);`

3. If the user chooses Sphere and enters a mass of 3kg and a radius of 2 m, what will be displayed in the command window?
 - a. Moment of Inertia = 4.8 kg m²
 - b. Moment of Inertia = 3.00 kg m²
 - c. Moment of Inertia = 12.00 kg m²
 - d. Moment of Inertia = 4.80 kg m²