Create the Matlab programs that solve the problems below and upload them to Canvas. More detailed instructions are on the class plan.

Problem 1
Write a Matlab program that has the user input the mass of a cube of gold in kg and calculates the length of a side of the cube in in. The specific gravity of gold is 19.3. Using the calculated length, print the following output statement: (test case shown)

```
Enter the mass of the cube [kilograms]: 0.4
The length of one side of the cube is 1.08 inches.
```

Problem 2
The Eco-Marathon is a competition in which participants build special vehicles to achieve the highest possible fuel efficiency. The current record of 10705 mi/gal was set by a vehicle using ethanol as fuel. Write a Matlab program to calculate how far the vehicle will travel given a user-specified amount of ethanol provided in grams. Express this distance in units of km. The specific gravity of ethanol is 0.789. Using the calculated distance, print the following output statement: (test case shown)

```
Enter the mass of ethanol [grams]: 100
The distance the vehicle traveled is 577 kilometers.
```

Problem 3
Write a Matlab program that calculates the efficiency of a stove-top burner given inputs on the time it takes to boil 1 gal of water. The user should input values for the initial temperature of the water ($^\circ F$), the time it takes to boil, the brand name of the appliance, and the power rating. Using the calculated efficiency and intermediate values, print the output statement: (test case shown; note the alignment, spacing, and percent symbol)

```
Household Appliance Efficiency Calculator: Stove

Type the initial room temperature of the water [deg F]: 68
Type the time it takes the water to boil [min]: 21
Type the brand name and model of your stove: Krispy 32-z
Type the power of the stove-top burner [W]: 1200

Energy required:          1267909 J
Power used by burner:     1006 W

Burner efficiency for a Krispy 32-z stove: 83.9%
```