ECE-1304-001 Spring 2020

Programming **PROJECT # 1**

Due date: **02/05/2020** (**11:59 p.m.**)

The ***electromagnetic spectrum*** represents the distribution of electromagnetic radiation according to energy, or equivalently, to **frequency** or **wavelength**. The following table gives **approximate** wavelengths and frequencies for selected regions of the electromagnetic spectrum.

Region	Wavelength (cm)	Frequency (Hz)
Radio	>10	$<3 \times 10^{9}$
Microwave	0.01 to 10	3×10^{9} to 3×10^{12}
Infrared	7×10^{-5} to <0.01	$>3 \times 10^{12}$ to 4.3×10^{14}
Visible	4×10^{-5} to $<7 \times 10^{-5}$	$>4.3 \times 10^{14}$ to 7.5×10^{14}
Ultraviolet	10^{-7} to $<4 \times 10^{-5}$	$>7.5 \times 10^{14}$ to 3×10^{17}
X-Rays	10^{-9} to $<10^{-7}$	$>3 \times 10^{17}$ to 3×10^{19}
Gamma Rays	$<10^{-9}$	$> 3 \times 10^{19}$

Write a Matlab program that uses prompts the user to select **wavelength OR frequency** (**positive value**) and then **displays** the corresponding **electromagnetic region**, using the data shown on the table above.

Your program **MUST** perform the **FOLLOWING TASKS**:

1. Use the Matlab ***menu*** and ***switch*** commands to allow the user to select **wavelength** or **frequency**.
2. After selecting frequency or wavelength, your program **MUST** prompt the user to enter a positive value from the keyboard corresponding to the wavelength (in ***cm*** units) or frequency (in ***Hertz*** units).
3. Your program **MUST** also allow the user to **START OVER** as often he/she wishes, **WITHOUT THE NEED** to rerun the program.

Example: if the user selected the option "**wavelength**" and inputted **0.001** your program should display **"Electromagnetic Region is: Infrared"**. If the user selected the option "**frequency**" and inputted **5e14**, your program should display "**Electromagnetic Region is: Visible**".