

CMPSC 201 – Fall 2017
Programming Project 1
To be done individually
Worth 40points
Due by 11:00 pm on 9/26/15

Goals: Developing problem-solving skills, declaring variables, multi-way branches, data validation.

Problem: Complete Programming Challenge 4.19 in your text book (Spectral Analysis on page 226). Do not accept values larger than 10 meters or smaller than 1×10^{-20} meters as input for the wavelength (check with a “**simple**” or “single-branched” if and ask the user to re-enter if his/her input if it is out of range). In addition to category of the wave also output the frequency and energy of the wave given the formula

$$\lambda v = c$$

where λ is the wavelength (m), v is the frequency, and c is the speed of light in a vacuum (3×10^8 m/sec) and the formula

$$E = hv$$

where E is the energy (J), h is Plank’s constant (6.626×10^{-34} J s), and v is the frequency (s^{-1}).

Your output should be like the following with your values in the blanks:

“_____ meters corresponds to _____ and has an
energy of _____ joules.”

The energy should be output using 4 significant figures.

Note to enter values in scientific notation list the value followed by e and the power of 10. For example you could declare a constant for the value of Plank’s constant with the C++ statement

```
const double Plank = 6.626e-034;
```

Do not use any concepts beyond Chapter 4 of your textbook. Remember to write introductory comments which includes your name and section number, the purpose of the program (with enough detail so someone reading your comments would not need to look for any information elsewhere), input, output, and processing specified. Attach your source code file to submission on Canvas.