



Problem Set:	Assignment: AG02	Semester:	Fall 2018
Points:	See autograder		
Date Set:	See autograder	Due Date:	See autograder
Course:	CS118 Prog. Fundamentals	Instructor:	Dr. Nauman

1 Defining Functions

Since you are reading this, you have already downloaded and extracted the zip file.

1.1 Tasks to do

1. Open the file `a02.py` and look between the markers. You may ignore the code outside the markers completely. You may run the code by typing the following from the shell: `python a02.py`
This will not run the tests but the code itself.

2. There are two main tasks to complete.

- (a) The force exerted by a moving object can be calculated using the following simple formula:

$$F = ma$$

Where m is the mass and a is the acceleration.

Write a function named `calculate_force` that takes both the mass and acceleration as input and computes the force.

- (b) For the second question, you need Einstein's famous equation:

$$E = mc^2$$

Where m is the mass and c is a physical constant denoting the speed of light.

You need to write a new function named `find_and_print_energy` that calculates E given the mass. However, you are not required to only return the energy. Instead, the function should write to the console the following:

```
The energy equivalent of mass (mass) is: (energy)
```

Where `(mass)` should be replaced with the mass given as input to the function and `(energy)` should be replaced with the value you just calculated.

For example, if we give `0.0009` as input to this function, it should output the following:

```
The energy equivalent of mass 0.0009 is: 80887966086313.58
```

Make sure you output the exact message as shown above (including spaces and spellings). Otherwise, your code may not meet the specifications and would fail the tests.

- (c) For the above function `find_and_print_energy`, your function should also return the value of energy computed.
3. For both of these functions, if an argument of type other than float is given, you should simply return `None`.

1.1 Tasks to do

4. You may change the values in function calls at the end of the file `a02.py` to check the functions.
5. You can get an accurate value of the physical constant `c` from the module: `scipy.constants`
6. Run local tests and if they pass, submit the assignment using the submission command given on the Autograder assignment page. (Same as the first assignment.)