CSC1015F Assignment 1

Introduction

Assignment Instructions

The first two questions in this assignment give you practice in typing in and editing programs. The next two are slightly more substantial. Question three involves a program that consists of the right statements but in the wrong order. Last but not lease, Question 4 gives us some level of independence whereby we get to write our own program as per the given specification.

Questions 1 and 2 can be found under Assignment 1C on Amathuba. These questions will be available at the start of your session, and you are required to complete them in the lab using lab computers.

Question 3 [30 marks]

You will find the following program on the Amathuba page for this assignment. It is called 'time.py'.

NOTE: leave the author of the code as "Stephan Jamieson" as that will be a way of referencing/acknowledging the author. Remember that if we do not acknowledge the author, that constitutes plagiarism.

```
# Program to convert an amount of minutes into an equivalent amount
# of days, hours and minutes.
#
# Name: Stephan Jamieson
#
minutes = int(input_str)
days = hours//24

print(".")

hours = minutes//60

print("The number of days is", days, end=', ')
print("and the number of minutes is", minutes, end='')

minutes = minutes%60

print("the number hours is", hours, end=', ')

input_str = input("Enter a quantity of minutes: ")
hours = hours%24
```

The program consists of correct statements that are in the wrong order. Here is an example of how the program is supposed to behave:

```
Enter a quantity of minutes: 3500
The number of days is 2, the number hours is 10, and the number of
minutes is 20.
```

Download the program and rearrange the statements so that it operates correctly.

HINT: check you understand what the integer operations '//' and '%' do, and think how, given an amount in minutes, you would calculate the equivalent amount of days, hours and minutes.

Question 4 [30 marks]

Albert Einstein[1] once said "*it followed from the special theory of relativity that mass and energy are both but different manifestations of the same thing — a somewhat unfamiliar conception for the average mind.*"

You do not need to know the Physics behind the equation below. However, if you are curious, you may read further here: https://www.britannica.com/science/E-mc2-equation. Our interest is to write a python program to calculate the energy, *E*, given the values of the mass, *m*, and the speed of light, *c* based on the following equation:

$$E = mc^2$$

Task:

Write a program called 'energy.py' to input the values of the integer numbers *m* and *c*, then calculate and output the value of the energy quantity from the equation above.

(**Note**: recall that, in Python, the statement d ** 3 is equivalent to d^3)

Sample I/O (The input from the user is shown in bold font)
```
Enter the value of m:
6
Enter the value of c:
6
The value of energy, E, is: 216
```

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[1] See https://www.forbes.com/sites/startswithabang/2018/01/23/the-three-meanings-of-emc2-einsteins-most-famous-equation/?sh=e19fd8a71c0b Last accessed on 16th February 2023.

Sample I/O *(The input from the user is shown in bold font)*

```
Enter the value of m:
4
Enter the value of c:
6
The value of energy, E, is: 144
```

Submission

Create and submit to the automatic marker a Zip file called `ABCXYZ123.zip` (where ABCXYZ123 is YOUR student number) containing `time.py`, and `energy.py`.