Assignment 3
Advanced Programming (INFO135)

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Deadline:	13:00, Friday, 04.03.2022

1. What is the printed output of the following code snippet?

```python
def hash_function(input_string, table_size):
    total = 0
    length = len(input_string)
    for pos in range(length):
        total = total + ord(input_string[pos]) + length
    return total % table_size


my_list = ['a1b2c3', 'CiTiBnk', '232323', 'myLaptop']
my_choice = 19

for item in my_list:
    print(hash_function(item, my_choice), end='')
```

2. Write a class **HashClass** that has:
   - a constructor method to receive the id number of a person as parameter.
   - a method called **hash_it()** that generates a random integer number called salt (ranging from 1 to 1000), adds the value of salt to the id number, and then hashes the result using SHA algorithm (see Lecture 6).
   - a method called **print_it()** that prints out the generated hash number.
   - Use **random.randint()** to generate a random integer number.

```python
import hashlib as hl
import random

class HashClass:

    def __init__(self, id_num):
        <add your code here>
```

```python
    def hash_it(self, id_num):
        <add your code here>

    def print_it(self):
        <add your code here>
```

```python
mmy_hash = HashClass(11011999)
my_hash.print_it()
```

[Output]

773030b9c773c67094447ea97855c7bccb469ad7

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3. The following image shows the IMDB Top movies in 2020. You are given a List of Tuples, each representing (title, budget) of movies. Budgets are given in $ Million.

    Write a Python function, called **sort_and_print()**, that first sorts the movies based on their budgets and then **prints the title** of the movie with the **largest budget**.

    [Note]: You can implement **any sorting algorithm** you prefer.

Budget [$M]

```python
list_of_tuples = [('Birds of Prey', 97.1),
                  ('Dolittle', 175.0),
                  ('The Gentlemen', 7.0),
                  ('Falling', 22.0)]
```

```python
sort_and_print(list_of_tuples)
```

[Output]:
```
The movie with largest budget is:
Dolittle
```

4. Write a "**recursive**" function called **magic_function()** that receives as input a string variable and computes and returns a list of all permutations of a given input. See the example below:

```python
result = magic_function("abcd")
print(result)
```

[Output]:

```
['abcd', 'abdc', 'acbd', 'acdb', 'adbc', 'adcb', 'bacd',
'badc', 'bcad', 'bcda', 'bdac', 'bdca', 'cabd', 'cadb',
'cbad', 'cbda', 'cdab', 'cdba', 'dabc', 'dacb', 'dbac',
'dbca', 'dcab', 'dcba']
```