Python Final Exam

1. Solve all of the following tasks:
    a. Write a Python program, which retains every second element in the list:
    Sample input: [2,3,6,711,3,9]
    Sample output: [3,711,9]

    If you feel more advanced, try to do it, using several different programming paradigms (iteratively, functionally, or why not a simple list comprehension)

    b. Write a Python program, which finds the longest element, from a list of strings:
    Sample input: [“car”, ”ball”, ”monster truck”]
    Sample output: “monster truck”

    c. Write a Python program, which checks whether a given string is a palindrome:
    Sample input: “mom” Sample input: “racecar”
    Sample output: True Sample output: True

    Sample input: “ball”
    Sample output: False

2. You are tasked to create a pie chart with the 5 most popular programming languages. You found the following statistics on the Internet:

Language	Java	Python	PHP	JavaScript	C++
Percent	22.2	17.6	28.8	23.7	7.7

    Try to recreate it in MatPlotlib and save the result as an image file.

3. Create an SQL database, with a table containing Pets. Each pet should have the following attributes: breed, age, name, weight. Save several Pet objects in the database.

    Hint: Easiest approach would be to use an ORM (SQLAlchemy) and Object Oriented Pattern.

    Advanced Create a DJANGO API where you can request the pets by id or name. e.g. localhost.com/pets/1 and send a sample request.

4. Solve all of the following tasks:
    a. How would you write a regex that matches a number with commas for every three digits? It must match the following:
        - '42'

- '1,234'
- '6,368,745'

But not the following:

- '12,34,567' (which has only two digits between the commas)
- '1234' (which lacks commas)

b. How would you write a regex which replaces the comments in an HTML document? A comment in HTML begins with “<!--” and ends in “-->”
Sample input: Welcome to my <!-- awesome -->
website<!-- bro -->
Sample output: Welcome to my website

5. Create a small Django project. Try to show some of the techniques learned in the last few weeks.

Bonus task:

6. Implement the following structure of Classes and Subclasses in Python. Choose some attributes and methods in each class by yourself – try to show off that you know the Inheritance and Polymorphism principles.