Advanced Programming: Homework- 3

تمرین شماره سه درس برنامه سازی پیشرفته

9.10 Exercises

1. What is the difference between a class and an object?

- A class is a blueprint for declaring and creating objects.
- An object is a class instance that allows programmers to use variables and methods from inside the class.
- Memory is not allocated to classes.
- Classes have no physical existence.
- You can declare a class only once.
- A class can be used to create many objects.
- Class is a logical entity.
- An object is a physical entity.
- We cannot manipulate class as it is not available in memory.
- Objects can be manipulated.
- Class is created using the class keyword like class Dog{}
- Objects are created through new keyword like Dog d = new Dog();.

We can also create an object using the newInstance() method, clone() method, fatory method and using deserialization.

2. What are some other names for the term instance variable?

- Instance variables in a class: these are called fields or attributes of an object .

3. What is another name for the term method?

- The answer is oparations .

4. What symbol associates an object with a method invocation?

- It’s dot .

5. How does a method differ from a function?

- The method operates the data in the class, while a function is used to return or pass the data. A function can be directly called by its name, while a method can't be called by its name. The method lies under Object-Oriented Programming, while a function is an independent functionality.

6. What method from the string class returns a new string with no leading or trailing whitespace?

- Using the strip() method . The strip() method removes leading and trailing whitespace characters (spaces, tabs, and newline characters) from a string. It delivers an output of a new string with no whitespace character, but the original is not modified .

7. What function returns the length of its string argument?

- Python's built-in len() function calls its argument's . __len__() method. This method returns the length of the DataFrame's .

8. What type of object does the open function return?

- The open() function opens a file, and returns it as a file object .

9. What does the second parameter of the open function represent?

- The second parameter of the open() function is the mode , a string with one character. That single character basically tells Python what you are planning to do with the file in your program.

Modes available are:

1. Read ("r")
2. Append ("a")
3. Write ("w")

پاسخ سوال های ۱۰و۱۱و۱۴ را در PyCharm نوشته ام و در GitHub قرارداده ام و در اینجا فقط روی سوال ها را نوشته ام .

10. Write a program that stores the first 100 integers to a text file named numbers.txt. Each number should appear on a line all by itself.

11. Complete the following function that reads a collection of integers from a text file named numbers.txt. Each number in the file appears on a line all by itself. The function accepts a single parameter, a string text file name. The function returns the sum of the integers in the file.

def sumfile(filename):

Add your code here . . .

12. Provide the syntactic sugar for each of the following methods of the Fraction class:

(a) __sub__ ➔ - (Minus for two numbers) ➔ s . __sub__(a) is equivalent to s -a

(b) __eq__ ➔ = = (equal sign) ➔ s .__eq__ (a) is

equivalent to s = = a

(c) __neg__ ➔ - (Negative for a number) ➔ s .__neg__( ) is equivalent to -s

(d) __gt__ ➔ > (being older) ➔ s.__gt__(a) is

equivalent to s > a

13. How is using a Turtle object from Python's Turtle graphics module different from using the free functions; for example, t.penup() versus penup()?

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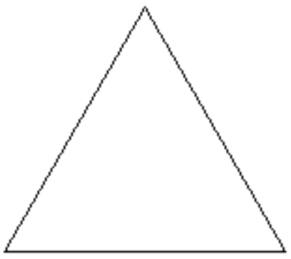
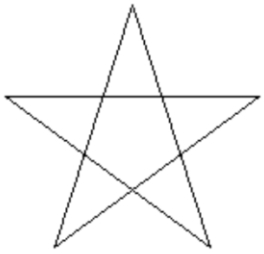
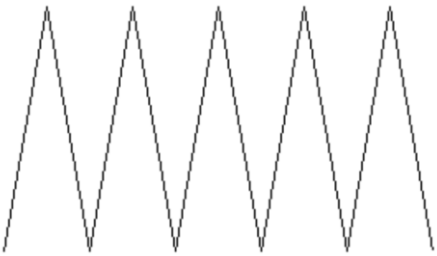
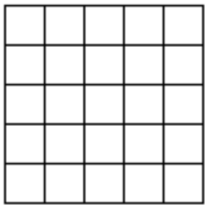
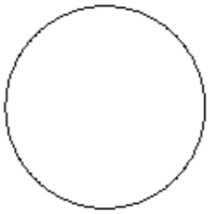
14. For each of the drawings below write a program that draws the shape using a Turtle object from Python's Turtle graphics module.

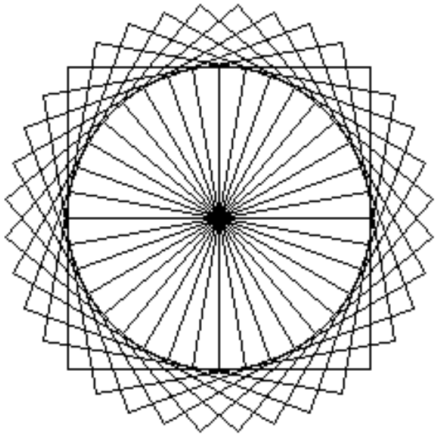
1 

2 

3 

4 

5 

6 

15. Does Python permit a programmer to change one symbol in a string object? If so, how?

- Python strings are immutable, you change them by making a copy. The text[1:] returns the string in text from position 1 to the end, positions count from 0 so '1' is the second character.

16. What would be the consequences if a turtle.Turtle object were immutable?

- If the turtle is immutable, we can't change the shape's color, we can't move it (left, right, etc.), we can't even change the size of our text at all. For these reasons, we cannot use the turtle .

17. In the context of programming, what is garbage?

- The garbage collector is keeping track of all objects in memory. A new object starts its life in the first generation of the garbage collector. If Python executes a garbage collection process on a generation and an object survives, it moves up into a second, older generation.

18. What is garbage collection, and how does it work in Python?

- Garbage collection is to release memory when the object is no longer in use. This system destroys the unused object and reuses its

memory slot for new objects. You can imagine this as a recycling system in computers. Python has an automated garbage collection.

19. Consider the following code:

```
a = "ABC"

b = a

c = b

a = "XYZ"
```

(a) At the end of this code's execution what is the reference count for the string object "ABC"?

- The answers are 2, b and c .

(b) At the end of this code's execution is b an alias of a?

- The answer is No ,because a changes in the last line.

(c) At the end of this code's execution is b an alias of c?

- The answer is Yes .