

## Joy and Beauty of Data, Second Practicum – March 30, 2017

Name \_\_\_\_\_

Question One. 25 points. Supply the missing function so that when this code runs:

```
stranger_things = {}
stranger_things["The Vanishing of Will Byers"] = "The Duffer Brothers"
stranger_things["The Weirdo on Maple Street"] = "The Duffer Brothers"
stranger_things["Holly, Jolly"] = "Shawn Levy"
stranger_things["The Body"] = "Shawn Levy"
stranger_things["The Flea and the Acrobat"] = "The Duffer Brothers"
stranger_things["The Monster"] = "The Duffer Brothers"
stranger_things["The Bathtub"] = "The Duffer Brothers"
stranger_things["The Upside Down"] = "The Duffer Brothers"
```

```
def episodes_directed(x,y):
    x = 0
    for i in len(stranger_things):
        if stranger_things[i] == y:
            x = x + 1
        else:
            pass
    print(str(y) + "directed " + str(x) + " episodes")

episodes_directed(stranger_things, "The Duffer Brothers")
episodes_directed(stranger_things, "Shawn Levy")
episodes_directed(stranger_things, "Kerri Cobb")
```

The following output is produced:

**The Duffer Brothers directed 6 episodes**

**Shawn Levy directed 2 episodes**

**Kerri Cobb directed 0 episodes**

Question Two. 50 points. Supply the missing class and methods so that when this code runs:

```
# "Stranger Things" is the title of the series.
# "The Duffer Brothers" is the creator of the series.
# 1 is the number of seasons that the series has run.
# 8 is the number of episodes that the series contains.
# here comes the next season
# there are now 9 more episodes

class Series:
    def __init__(self,name,creator,seasons,episodes):
        self.name = "name"
        self.creator = "creator"
        self.seasons = "seasons"
        self.episodes = "episodes"
    def __str__(self):
        return (self.name + " has aired " + self.episodes + " episodes over " + self.seasons + " seasons.")
    def addSeason(self):
        self.seasons += 1
    def addEpisodes(self,number):
        self.episodes += number

stranger_things = Series("Stranger Things", "The Duffer Brothers", 1, 8)
```

The following output is produced:

```
print(stranger_things)
stranger_things.addSeason()
stranger_things.addEpisodes(9)
print(stranger_things)
```

Stranger Things has aired 8 episodes over 1 seasons.  
Stranger Things has aired 17 episodes over 2 seasons.



Question Three. 25 points. Object Oriented Concepts.

(a) What is the name of the constructor method in a class?

`__init__`

(b) Suppose the class **Athlete** is already defined and we want to define a new class called **Runner** that is a subclass of **Athlete**. Complete the following one line of Python:

```
class Runner (Athlete)
```

(c) In the context of the **Athlete** class, give a concrete example of the difference between an instance and an instance variable.

```
john = athlete(john, 70, 150)  
john.get_weight = 150
```

(d) Describe briefly the difference between a **reader method** and a **writer method**.

A reader method returns a value describing an object while a writer method edits values instead

(e) To override the **+** operator, an `__add__` method can be defined in a class. What method must be defined to override the **\*\*** operator?

`__pow__`