



# Polytechnic Tutoring Center

## Final Exam Review - CS 1114, Spring 2020

**Disclaimer: This mock exam is only for practice. It was made by tutors in the Polytechnic Tutoring Center and is not representative of the actual exam given by the CS Department.**

- 1** Given these assignments: **a = 5, b = 2, c = 1.5** and **s = '0.5'** write the type and value of the following expressions. Circle **ERROR** if the expression will result in a run time error.

Statement:	Type:	Value:	ERROR:
<code>float(a) / b</code>	_____	_____	ERROR
<code>s * b</code>	_____	_____	ERROR
<code>a / b</code>	_____	_____	ERROR
<code>a % b</code>	_____	_____	ERROR
<code>c // a</code>	_____	_____	ERROR
<code>s &gt; b</code>	_____	_____	ERROR
<code>s[1]</code>	_____	_____	ERROR
<code>a // b</code>	_____	_____	ERROR
<code>s[0] = '1'</code>	_____	_____	ERROR

## 2 Convert the following

$$(00101)_2 = (\underline{\hspace{2cm}})_{10}$$

$$(179)_{10} = (\underline{\hspace{2cm}})_2$$

$$(2076)_{10} = (\underline{\hspace{2cm}})_{16}$$

$$(B7D)_{16} = (\underline{\hspace{2cm}})_2$$

- 3 Given two lists, write a function to compute their intersection. Result should be a list of all the numbers appear in both input lists. The numbers in the result list can be in any order.

### Sample Output:

```
>>> num1 = [1,2,2,1]
```

```
>>> num2 = [2,2]
```

```
>>> print(intersection(num1, num2))
```

```
>>> [2]
```

```
>>> num1 = [4,9,5]
```

```
>>> num2 = [9,4,9,8,4]
```

```
>>> print(intersection(num1, num2))
```

```
>>> [9,4] # [4,9] is also a valid answer
```

### Code:

```
def intersection(num1, num2):
```

4 Given two files boxers.csv (name,nickname,strength) and matchups.csv (name1,name2):

boxers.csv

matchups.csv

James Douglas,“Buster”,84

Rocco Marciano,Jack Dempsey

Cassius Clay,“Muhammad Ali”,99

Arnold Cream,Walker Smith Jr.

Rocco Marciano,“Rocky”,92

Joe Frazier,James Douglas

Arnold Cream,“Jersey Joe Walcott”,80

Floyd Mayweather Jr., Rocco Marciano

Floyd Mayweather Jr.,“Money”,63

Cassius Clay, Joe Frazier

Joe Frazier,“Smokin’ Joe”,95

Walker Smith Jr.,Floyd Mayweather Jr.

Mike Tyson,“Iron Mike”,83

Jack Dempsey,Cassius Clay

Walker Smith Jr., “Sugar Ray Robinson”,100

James Douglas, Mike Tyson

Jack Dempsey, “The Manassa Mauler”,88

Mike Tyson,Arnold Cream

Write a function to store the information from boxers.csv in a list or dictionary and return it. Write another function to read matchups.csv and the data structure you stored information before to print the winner of the matchup(The winner is the boxer with the greater strength). The main and the function prototypes are given below:

```
def readboxers(filename):
```

```
def boxingmatches(filename,fighter_str):
```

```
def main():
```

```
    strength_table = readboxers('boxers.csv')
```

```
    boxingmatches('matchups.csv', strength_table)
```

```
main()
```

**Sample Output:**

```
Rocco Marciano defeats Jack Dempsey
Walker Smith Jr. defeats Arnold Cream
Joe Frazier defeats James Douglas
Rocco Marciano defeats Floyd Mayweather Jr.
Cassius Clay defeats Joe Frazier
Walker Smith Jr. defeats Floyd Mayweather Jr.
Cassius Clay defeats Jack Dempsey
James Douglas defeats Mike Tyson
Mike Tyson defeats Arnold Cream
```

**Code:**

```
def readboxers(filename):
```

```
def boxingmatches(filename,data_struct):
```

```
def main():
```

```
strength_table = readboxers('boxers.csv')  
  
boxingmatches('matchups.csv', strength_table)
```

- 5 Write a function (just a function) that iterates through a list of integers and checks if any of the odd integers are in increasing order. The return type should be a boolean value. You can assume the values will be positive.

**Sample Outputs:**

```
checkfunction([1,4,2,3,8,10,5]): True
```

```
checkfunction([2,6,3,12,13,20,11]): False
```

**Code:**

```
def checkfunction(lst):
```

- 6 Write a function (just the function) that will sum the numbers in the string and return the result.

**Sample Output:**

```
Enter a string: x2m56ii
```

```
The sum is: 13
```

**Code:**

```
def sumNum(word):
```

- 7 Write a function that takes a temperature in Fahrenheit from user input, and if the number is not divisible by 2 convert it to Kelvin, if it is divisible by 2 converts it to Celsius. However, if any number is divisible by 3 do nothing to it. Return the number value and a string that indicates what is the resulting temperature system. Then write the main to prompt the user for the temperature and print out the information. Limit to 3 decimal places.

(Hint:  $K = (F + 459.67) \times \frac{5}{9}$ ,  $C = (F - 32) \times \frac{5}{9}$ )

**Sample Output:**

```
Enter temperature in Fahrenheit: 67
The temperature in Kelvin is 292.594
```

```
Enter temperature in Fahrenheit: 21
The temperature in Fahrenheit is 21.000
```

```
Enter temperature in Fahrenheit: 88
The temperature in Celsius is 31.111
```

**Code:**

```
def convert(temp):
```

```
def main():
```

- 8 Complete the following class definition. (Note: c3 and c4 must be type "Complex"). Note that the class is initialized with a string of form "a+bi" (look at the main function).

```
class Complex:

    def __init__(self, s): # Modify this

        self.real =

        self.img =

    def add(self, other):

        # Write this

    def sub(self, other):

        # Write this

    def print(self):

        # Write this

def main():

    c1 = Complex("1+2i")

    c2 = Complex("-3-4i")

    c3 = c1.add(c2)

    c4 = c1.sub(c2)

    c3.print()

    c4.print()
```

**Expected output :**

```
>> '-2-2i'
```

```
>> '4+6i'
```

**Code:**