

# Lecture 25: Introduction to Computer Programming Course - CS1010

DEPARTMENT OF COMPUTER SCIENCE

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04/25/2019



Rensselaer

# Announcements

- Final Exam is on April 30<sup>th</sup>
- Timing 6:30 pm to 9:30 pm
- Location: DCC 330

# Goals for Today

- **Exam Review**
- **In Class Exercise**

# Structure of the Exam

- Cumulative: Cover everything from Lecture 1 to Lecture 24
- Questions format/level: Of the type from Exam 1, Exam 2, Homeworks and Class Exercises.
- 10 Questions to be completed in 3 hours.
- **You can bring 3 A4 Size Sheets (handwritten or typed)**
- **Usual disclaimer:** Anyone caught cheating on the final will receive an immediate F in the course.

# About the Topics

- **Disclaimer:** This is a high level overview of what will be on the final. Unless I specifically say something will not be on the final, it may be on the final.
- The exam will be cumulative.
- Check the Lecture Slides for topics.
- There will be more emphasis on the material from after Exam 2.

# Question 1: 20 points – 2 points each

- Multiple Choice: Choose from 4 options
- Example:
- If  $L=[1,2,3,4,5]$ , what is  $L[-1]$ :
  - a. 2
  - b. 5
  - c. 3
  - d. 4

# Q1: Example

- In the top-down design process, what is the step that devises the solution called?
  - a. Coding
  - b. Executing
  - c. Analyzing
  - d. Writing Algorithm

## Question 2: 10 points – 1 point each

- Write a one or at most 2 lines of explanation.
- Example 1:
  - `A.intersection(B)`
  - Answer: Finds the intersection of sets A and B
- Example 2:
  - `L=[1,1,2,3,4,5,1]`
  - `L.count(1)`
  - Answer: Creates a list and counts the number of 1's in it



## Question 3: 10 points- 2 points each

- For each part there is some code given.
- In the end there is a question that asks you to answer in True or False ONLY.
- The question will be printed in bold to ensure that you differentiate between the code and the statement/question.
- Your True or False is for the statement not the code in general.

# Question 3

Example 1

```
set_x = set(["a", "b","c"])  
set_y = set(["b", "d","f"])  
set_c = set_x ^ set_y  
print(set_c)
```

**The code above prints/returns the set {b}.**

# Question 3

- Example 2:

```
list1=[1,2,3,4,5,6,6,6]
```

```
new=set(list1)
```

```
new
```

```
print(sum(new)/len(new))
```

**The code above returns the average of all numbers in list1.**

## Question 4: 15 points- 3 points each

- Find the error in the code provided
- Error must be something that prevents the program from running.
- We are not looking for any logical errors because there is no problem you are solving here.

# Question 4

- Example 1:
  - $M = ['a', 'b', 'c']$
  - `print ("Element = ",(M[3]))`
- Example 2:
  - $A=\{1,2,3\}$
  - $B=\{3,4,5\}$
  - $A \cap B$

# Question 5: 10 points- 2 points each

- Write a **single line (or at most 2 lines)** of code to accomplish the given task.
- Dictionary Operations
- Example:
  - `key_value = {}`
  - Add a key=2 with value 5 to `key_value`
  - Answer: `key_value[2] = 5`
- More examples can include other dictionary operations (covered in class only)

## Question 6: 5 points

- Write some code for a given problem along with its algorithm.
- Code is worth 2 points and algorithm is worth 3 points.
- For the algorithm write a detailed list of steps required to accomplish the task. (See Lecture 24)
- You can use a Flowchart as well but make sure to correctly know the symbols.

# Question 6: Example

- Given a list L and an integer m. Find the index of the first occurrence of the integer in the list. If the integer is not in the list print the list.
- Solution:
- Algorithm:
  1. If L is not in M then return L
  2. If M is in L then loop through each element until a match is found.
  3. As soon as the match is found save the index corresponding to the match
  4. Return the index



## Question 7: 10 points- 2 points each

- Select the output of each code from the options given.

Example 1

```
arr = [1, 2, 3, 4, 5, 6]
```

```
for i in range(1, 6):
```

```
    arr[i - 1] = arr[i]
```

```
for i in range(0, 6):
```

```
    print(arr[i], end = " ")
```

- **A.** 1 2 3 4 5 6
- B.** 2 3 4 5 6 1
- C.** 1 1 2 3 4 5
- D.** 2 3 4 5 6 6

# Question 7: Example 2

```
fruit_list1 = ['Apple', 'Berry', 'Cherry', 'Papaya']
```

```
fruit_list2 = fruit_list1
```

```
fruit_list3 = fruit_list1[:]
```

```
fruit_list2[0] = 'Guava'
```

```
fruit_list3[1] = 'Kiwi'
```

```
sum = 0
```

```
for ls in (fruit_list1, fruit_list2, fruit_list3):
```

```
    if ls[0] == 'Guava':
```

```
        sum += 1
```

```
    if ls[1] == 'Kiwi':
```

```
        sum += 20
```

```
print (sum)
```

**A. 22**

**B. 21**

**C. 0**

**D. 43**

## Question 8: 10 points – 2 points each

- There is a function given and the function is called using some arguments.
- What is the output after running the entire code?
- Select from 4 options given.

# Question 8: Example

- `def countdict():`
  - `from collections import Counter`
  - `d1 = {'a': 100, 'b': 200, 'c': 300}`
  - `d2 = {'a': 300, 'b': 200, 'd': 400}`
  - `d = Counter(d1) + Counter(d2)`
  - `return (d)`
  - `countdict()`
- 1. `Counter({'a': 400, 'b': 400, 'c': 300, 'd': 400})`
  - 2. `Counter({'a': 100, 'b': 400, 'c': 300, 'd': 400})`
  - 3. `Counter({'a': 400, 'b': 200, 'c': 300, 'd': 400})`
  - 4. `Counter({'a': 400, 'b': 400})`

# Question 9: 5 points :1 point each

- You are given some code
- You need to write the output.
- There are not options to choose from in this problem.
- Example:

```
people = {"Jay", "Id", "Arch","Joe"}  
vampires = {"Kar", "Joe"}  
population = people.union(vampires)  
population
```

# Question 10: 5 points :1 point each

- Write the Output of each program given, in either 'True' or 'False'.
- Logical Comparisons
- Example 1:
  - `x=True`
  - `x and x == x`
- Example 2:
  - `x={1,2,3,4,4,3,1,1,1,2,2}`
  - `y={1,2,3,4}`
  - `x!=y`



# In Class Exercise

- Given In Class



# The End!

- Please feel free to contact me for anything before the exam.
- Also, if anyone is interested in summer research please email me.
- Stay in touch if you would like:
  - My Linkedin Id: [www.linkedin.com/in/uzmamushtaque](http://www.linkedin.com/in/uzmamushtaque)
  - My Youtube Channel:  
[https://www.youtube.com/channel/UCtjldWnllGpeTuqcniM9jSQ?view\\_as=subscriber](https://www.youtube.com/channel/UCtjldWnllGpeTuqcniM9jSQ?view_as=subscriber)
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