

NAME: _____ RPI ID _____

CS1010 Introduction to Computer Programming Spring 2019

Exam 2 (Make-up)

Please read the following pledge, then sign and print your name on the spaces provided, certifying the statement:

On my honor as a Rensselaer Polytechnic Institute student, I have abided by academic integrity standards on this exam, which means that I will not give or take answers from anyone.

Your Signature and Date

Your PRINTED name

Rules: There are **6 questions** in all to be completed in **1 hour 50 minutes**.

1. Work entirely alone. Do not give or solicit assistance from any other student. Academic dishonesty will not be tolerated.
2. Sit in your assigned seat.
3. Turn off cell phones and smart phones.
4. The exam allows use of hand written notes (2 pages A4 size) for reference.
5. Feel free to use the restrooms as necessary. Just leave all your materials at your seat.
6. If you have a question, bring it down to the front so as to minimize disruption.

Question 1 _____

Question 2 _____

Question 3 _____

Question 4 _____

Question 5 _____

Question 6 _____

Total (From 100 points): _____

Question 1. What is the output of the following code. There is no error in this code. **(25 points: 5 points each)**

Code	Output
<pre>x=23 while x in range(23,50): if x%2==0: print(x, end=' ') x+=1</pre>	<pre>24 26 28 30 32 34 36 38 40 42 44 46 48</pre>
<pre>Number = 6 for row in range(1, Number): for column in range(row, 0, -1): print(column, end=' ') print("")</pre>	<pre>1 2 1 3 2 1 4 3 2 1 5 4 3 2 1</pre>
<pre>rows=6 for i in range (0, rows): for j in range(0, i + 1): print("*", end=' ') print("\n")</pre>	<pre>* *</pre>
<pre>a = 0 while a < 5: b=0 while b<5: print('*', end='') b+=1 print() a+= 1</pre>	<pre>***** ***** ***** ***** *****</pre>

<pre> l1=[1,2,3,4] l2=[-2,3,1,0] l3=[] i=0 while i<len(l1): y=l1[i]+l2[i] l3.append(y) i+=1 print(l3) </pre>	<pre> [-1, 5, 4, 4] </pre>
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Question 2. Find all factors of a user provided number n including 1 and itself. For example, 10 has factors 1,2,5,10. **(10 Points).**

Solution:

```

num=int(input("enter a number "))
factors=[]
i=1
while i <=num+1:
    if num%i==0:
        factors.append(i)
    i+=1
print (factors)

```

Question 3. Explain what each line of code does in not more than 1 line. **(10 points: 2 points each)**

- a. `im = Image.open(filename)`
`im.crop((0, 0, 600, 600))`

Opens and crops image 'filename'

- b. `tup1=('a','b','a')`
`tup1.count('a')`
 Creates a tuple and counts number of 'a' s.

- c. `im = Image.open(filename)`
`im.size`
 Opens and displays pixel size of an image.

- d. `im.convert('L')`
Converts an image to grayscale.
- e. `Newobj=[1,2,3]`
Creates a list of 3 elements.

Question 4. What is wrong with the following code. Assume each of the following is a separate program. Find the first error in the code that prevents it from generating output. If there is an error describe it in the solutions box on the right. If there is no error simply write NO ERROR.
(20 points: 5 points each)

Code	Solution
<pre>Test1 = (0, 1, 2, 3) Test1[0] = 4</pre>	Tuple does not support assignment (immutable)
<pre>while (count < 9): print("Hello World") count = count + 1</pre>	Counter not initialized
<pre>def capitalize_list(names): for n in names: n = n.capitalize()</pre>	NO ERROR
<pre>def new(a,b): c=a+b/(a-b) print(c) new(3,3)</pre>	Zero division error

Question 5.

List Operations: Given a List,

`List_of_Integers = [1,5,0,2,6,8,10]`

Write a single line of code to accomplish the following: (10 points: 2 points each)

Question	Solution/code
Add number '12' to the list	<code>List_of_Integers.append(12)</code>
Arrange the list elements in this order: [0, 1, 2, 5, 6, 8, 10, 12]	<code>List_of_Integers.sort()</code>
Remove the number 10 from the list i.e. get	<code>List_of_integers.remove(10)</code>
Remove the last element from the list.	<code>List_of_integers.pop()</code>
Remove the zero from the list	<code>List_of_Integers.remove(0)</code>

Question 6

- a. Given a list of strings, find if each is a palindrome or not. Output a list with values True and False. True for a palindrome and False if not. **(10 points)**

A palindrome is a string that reads the same forward or backward.

Test Cases: ['abc','nursesrun','mom','car']→ [False, True, True, False]
['nun','apple','ababa']→ [True, False, True]

Solution:

```
def reverse(word):
    wrd=str(word)
    rvs=wrds[::-1]
    if wrd == rvs:
        return True
    else:
        return False

def test_reverse(words):
    new_list=[]
    for i in words:
        new_list.append(reverse(i))
    return new_list
```

- b. Given a list/array of integers, write a program that outputs a new list/array with the number two more raised to power its index. For example if input = [1,2,3,4] then output will be [(1²), (2³), (3⁴), (4⁵)] because the index of 1 is zero, index of 2 is 1, index of 3 is 2 and so on. **(10 points)**

Solution:

```
def square_num(x):
    final=[]
    for i in range(0,len(x)):
        final.append((x[i]**(i+2)))
    print(final)
```

- c. Write a Python program to print the even numbers from a given list. **(5 points)**

```
def is_even_num(l):
    enum = []
    for n in l:
        if n % 2 == 0:
            enum.append(n)
    return enum
print(is_even_num([1, 2, 3, 4, 5, 6, 7, 8, 9]))
```