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Quiz 1

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1. "What will be the output of the following code?

1 / 1 point

```
import re
string = 'bat, lat, mat, bet, let, met, bit, lit, mit, bot, lot, mot'
result = re.findall('b[ao]t', string)
print(result)
```

- 'bat, bet, bit, bot'
- ['bat', 'bot'] ✓
- ['bat', 'bet', 'bit', 'bot']
- 'bat, bot'

Correct
[au] means any character from 'a' and 'o' (or both) hence only 'bat' and 'bot' would be extracted

2.

1 / 1 point

$$L_2 = \sqrt{\sum_{i=1}^{n} (a_i - b_i)^2}$$

Assume **a** and **b** are two (20, 20) numpy arrays. The L2-distance (defined above) between two equal dimension arrays can be calculated in python as follows:

```
def l2_dist(a, b):
    result = ((a - b) * (a - b)).sum()
    result = result ** 0.5
    return result
```

Which of the following expressions using this function will **give an error**?

- l2_dist(np.reshape(a, (20 * 20)), np.reshape(b, (20 * 20, 1))) ✓
- l2_dist(a, b)
- l2_dist(a.T, b.T)
- l2_dist(np.reshape(a, (20 * 20)), np.reshape(b, (20 * 20)))

Correct
The ndim of the two inputs in D are different.

3. Consider the following variables in Python:

1 / 1 point

```
a1 = np.random.rand(4)
a2 = np.random.rand(4, 1)
a3 = np.array([[1, 2, 3, 4]])
a4 = np.arange(1, 4, 1)
a5 = np.linspace(1 ,4, 4)
```

Which of the following statements regarding these variables is correct?

- a4.ndim() == 1
- a1.shape == a2.shape
- a3.shape == a4.shape
- a5.shape == a1.shape ✓

✓ **Correct**
This is a correct expression because the two arrays have the same shape.

4. Which of the following is the correct output for the code given below? **1 / 1 point**

```
import numpy as np

old = np.array([[1, 1, 1], [1, 1, 1]])
new = old
new[0, :2] = 0

print(old)
```

- [[1 1 0][1 1 0]]
- [[1 1 1][1 1 1]]
- [[0 1 1][0 1 1]]
- [[0 0 1][1 1 1]]

✓ **Correct**
Array slices are passed by reference; After the statement 'new=old', any changes made to 'new' will carry over to 'old', so 'old' will not remain unchanged

5. Given the 6x6 NumPy array **r** shown below, which of the following options would slice the shaded elements? **1 / 1 point**

0	1	2	3	4	5
6	7	8	9	10	11
12	13	14	15	16	17
18	19	20	21	22	23
24	25	26	27	28	29
30	31	32	33	34	35

- r[[2,4],[2,4]]
- r[[2,3],[2,3]]
- r[2:4,2:4]
- r[2:3,2:3]

✓ **Correct**
Array indices start with 0 and an array slice from m:n includes elements from indices m to n-1.

6. **1 / 1 point**

```
import re
s = 'ACBCAC'
```

For the given string, which of the following regular expressions can be used to check if the string starts with 'AC'?

- re.findall('^[AC]', s)
- re.findall('AC', s)
- re.findall('^AC', s)
- re.findall('[^A]C', s)

✓ **Correct**
Here, the caret ^ denotes the beginning of the string, and hence will extract the first 'AC' from the string s.

7. What will be the output of the variable **L** after the following code is executed? **1 / 1 point**

```
import re
s = 'ACAABAACAAAB'
result = re.findall('A{1,2}', s)
L = len(result)
```

- 5
- 4
- 8
- 12

✓ **Correct**

The pattern we are using is a single A or a double A, hence we will find the results as (A)C(AA)B(AA)C(AA)(A)B.

8. Which of the following is the correct regular expression to extract all the phone numbers from the following chunk of text: **1 / 1 point**

```
Office of Research Administration: (734) 647-6333 | 4325 North Quad
Office of Budget and Financial Administration: (734) 647-8044 | 309 Maynard, Suite 205
Health Informatics Program: (734) 763-2285 | 333 Maynard, Suite 500
Office of the Dean: (734) 647-3576 | 4322 North Quad
UMSI Engagement Center: (734) 763-1251 | 777 North University
Faculty Adminstrative Support Staff: (734) 764-9376 | 4322 North Quad
```

- [ ] [(]\d{3}[)]\d{3}[-]\d{4}
- [x] [(]\d{3}[)]\s\d{3}[-]\d{4}
- [ ] \d{3}\s\d{3}[-]\d{4}
- [ ] \d{3}[-]\d{3}[-]\d{4}

Correct
The symbols '(', ')', and '-' that need to be extracted are properly separated by brackets and present (they aren't in other options). Also, the space character '\s' is present in the right places to match the pattern.

9. Which of the following regular expressions can be used to get the domain names (e.g. google.com, www.baidu.com) from the following sentence? **1 / 1 point**

```
'I refer to https://google.com and I never refer http://www.baidu.com if I have to search anyth
```

- [ ] (?<=https:\/\/)([A-Za-z0-9.]*)
- [ ] (?<=https:\/\/)([A-Za-z0-9]*)
- [ ] (?<=https:\/\/)([.]*)
- [x] (?<=[https]:\/\/)([A-Za-z0-9.]*)

Correct
Bracketing the [https] means we are looking for any and as many of those letters. Since the second web link begins with 'http' not 'https', 'https' should be surrounded by square brackets. Also, in 'A-Za-z0-9.', the '.' is required.

10. The text from the Canadian Charter of Rights and Freedoms section 2 lists the fundamental freedoms afforded to everyone. Of the four choices provided to replace **X** in the code below, which would accurately count the number of fundamental freedoms that Canadians have? **1 / 1 point**

```
text=r'''Everyone has the following fundamental freedoms:
    (a) freedom of conscience and religion;
    (b) freedom of thought, belief, opinion and expression, including freedom of the press and
    (c) freedom of peaceful assembly; and
    (d) freedom of association.'''

import re
pattern = X
print(len(re.findall(pattern,text)))
```

- [ ] `'[a-d]'`
- [ ] `(.)`
- [ ] `'freedom'`
- [x] `\(.\)`

Correct
This code will find any character that is not a linebreak that is within parenthesis, hence counting (a), (b), (c), and (d) which is same as counting the 4 fundamental freedoms