Assuming `S = "Hello, world!"`, what are the results of the following Python commands?

1. `S[-1]`

a. `"d"`
b. `"!"`
c. `"H"`
d. `"e"`

2. `S.isnumeric()`

a. `True`
b. `False`
c. `TypeError`
d. `1.0`

3. `"!" in S`

a. `True`
b. `False`
c. `NameError`
d. `None`

4. `S[10:len(S)]`

a. `IndexError`
b. `"old!"`
c. `"ld!"`
d. `"d!"`

Assuming `S = {"a":1, "b":2, "c":3}`, what are the results of the following Python commands?

5. `"c" in S`

a. 3
b. `True`
c. `False`
d. `"c"`

6. `len(S)`

a. 6
b. 3
c. 2
d. 5

7. What is the result of `import numpy as np; np.arange(0,9).reshape((3,3))`?

a. `((0, 1, 2),(3, 4, 5),(6, 7, 8))`

b. `ValueError`

c.

```
array([[0, 1, 2],
       [3, 4, 5],
       [6, 7, 8]])
```

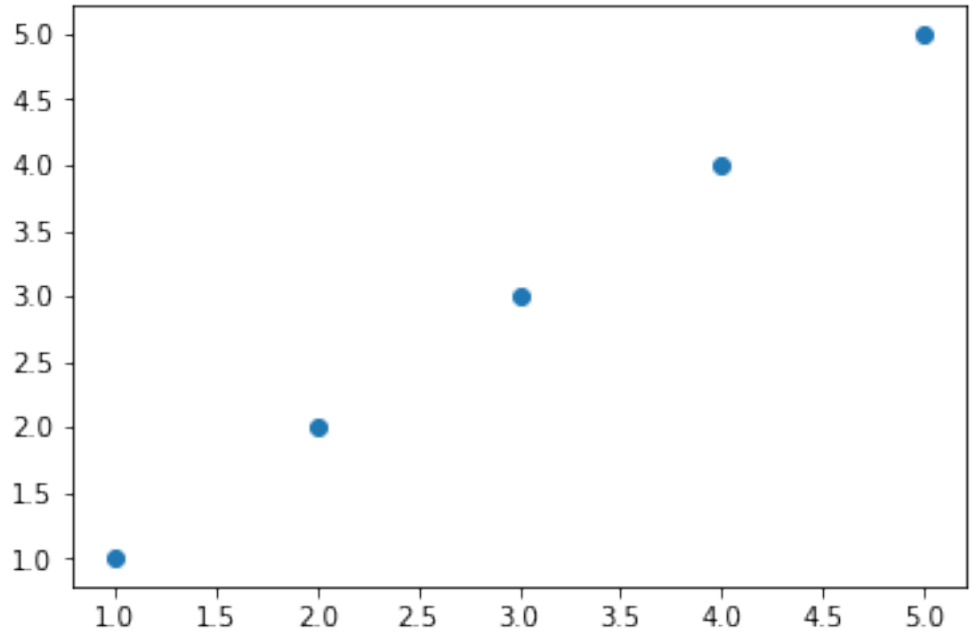
d.

```
[[0, 1, 2],
    [3, 4, 5],
    [6, 7, 8]]
```

8. Assume we have already run this code:

```
import matplotlib.pyplot as plt; import numpy as np
x = [1,2,3,4,5]
fig,ax = plt.subplots()
```

Which of the following sets of Python code produces this picture?



a. `ax.scatter(x,x)`
b. `fig.scatter(x,x)`
c. `ax.scatter(x)`
d. `fig.plot(x,x)`

Suppose we have a data frame

```
D = pd.DataFrame({"key": ["first","second","third"], "number": [0,1,2]})
```

9. Which of the following Python codes returns a sum of the column `number`?

   a. `D.loc[:,1].sum(axis = 1)`
   b. `D[:,1].sum(axis = 1)`
   c. `D.icol["number"].sum(axis = 0)`
   d. `D["number"].sum()`

What are the results of the following computations?

10. `1e-400`

    a. `inf`
    b. `0.0`
    c. `-inf`
    d. `nan`

11. `print(np.array(128, dtype = "uint8"))`

    a. `128`
    b. `-128`
    c. `-127`
    d. `inf`

12. Write a function `ave_no_max_min(DataList)` that returns the average of a given list of numbers (with no repeated values), excluding the maximum and minimum values. For example, `ave_no_max_min([2,4,3,5,11])` should return (3+4+5)/3 = 4; `ave_no_max_min([11,2,7,9])` should return (7+9)/2 = 8. Suppose we have the following code: choose the answer below that correctly fills in the missing lines.

```
def ave_no_max_min(DataList):
    l = len(DataList)
    result = 0
    DataList.sort()
    ## WHAT GOES HERE??
    return result
```

a. `result = sum(DataList[1:l-2])/l`

b. `result = sum(DataList[1:l-1])/l`

c. `result = sum(DataList[1:l-2])/(l-2)`

d. `result = sum(DataList[1:l-1])/(l-2)`

13. Suppose `time` is a numeric value between 0 and 24 (inclusive) and the day of the week `day` is encoded as Sunday = 0, Monday = 1, ..., Saturday = 6. You work (result is `True`) between 9 AM (`time` = 9) and noon (`time` = 12) and then from 1PM (`time` = 13) to 5PM (time = 17) on weekdays. You do not work (result is `False`) on the weekend. For example, when `time=14` and `day=0`, the result should be `False`; when `time=15` and `day=1`, the result should be `True`. Which of the following Python codes is correct?

a. `5>=day>=1 and (12>=time>=9 or 17>=time>=13)`
b. `(day >=1 and day <= 5) and ((12>=time or time>=9) or (17>=time or time>=13))`
c. `(5>=day>=1 and 12>=time>=9) or (17>=time>=13)`
d. `(day >=1 and day <= 5) and ((12>=time or time>=9) and (17>=time or time>=13))`

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solutions

1b; 2b; 3a; 4c; 5b; 6b; 7c; 8a; 9d; 10b; 11a; 12d; 13a