Python Programming

12/14 points earned (85%)

Excellent!

Retake

Course Home

1 / 1 points

1. Which matrix corresponds to the following code?

```
1  A = np.array([[1, 2, 3], [2, 3, 4], [3, 4, 5], [4, 5, 6]])
```

- $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \\ 4 & 5 & 6 \end{bmatrix}$

Correct

- $A = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 2 \\ 3 \\ 4 \\ 5 \\ 3 \\ 4 \\ 5 \\ 6 \end{bmatrix}$
- $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 2 & 3 & 4 & 5 & 3 & 4 & 5 & 6 \end{bmatrix}$
- $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 \end{bmatrix}$

✖

0 / 1 points

2. Given the 2D array (i.e., matrix) $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 \end{bmatrix}$, which of the following expressions generates $B = \begin{bmatrix} 2 & 3 & 4 \\ 4 & 5 & 6 \end{bmatrix}$

- ○
```
1  B = A[[0, 2], 2:]
```
- ○
```
1  B = A[[0, 2], 1:]
```
- ◯
```
1  B = A[1:, [0, 2]]
```

This should not be selected

- ○
```
1  B = A[[1, 3], 2:]
```
- ○
```
1  B = A[:, :]
```

✔

1 / 1 points

3. Suppose you have a script that contains the line

```
1  A = np.array([1, 2, 3])
```

but when you run it, the following error occurs:

```
1  Traceback (most recent call last):
2    File "&lt;stdin&gt;", line 1, in &lt;module&gt;
3  NameError: name 'np' is not defined
```

How do you correct it?

Insert the following at the end of your script:

```
1  from numpy import *
```

Insert the following at the start of your script:

```
1  from numpy import *
```

Insert the following at the start of your script:

```
1  import numpy as np
```

Correct

Insert the following at the end of your script:

```
1  import numpy as np
```

---

0 / 1 points

4. Given that numpy is imported as np, and that you have defined the one-dimensional array $a = \begin{bmatrix} 1 & 2 & 3 & 4 \end{bmatrix}$, which of the following commands will not raise an error? Check all that apply.

```
1  b = np.ones((5, 5))
```

Correct

```
b = np.ones(5, )
```

Correct

```
b = np.ones(5, 5)
```

Un-selected is correct

```
b = a[:5]
```

Correct

```
b = a[:2, :2]
```

Un-selected is correct

```
b = a[4:]
```

This should be selected

```
b = a[:2]
```

Correct

```
1  b = a[4]
```

Un-selected is correct

---

1 / 1 points

5. Which piece of code generates an array x of 100 random numbers between 0 and 1?

```
1  x = random(100)
```

```
1  x = np.random(100)
```

```
1  x = np.random.rand(100)
```

Correct

---

1 / 1 points

6. Suppose x is an array of 100 random numbers between 0 and 1. Which piece of code sets to 1 all elements of x that are greater than 0.5?

```
1  x[> 0.5] = 1
```

```
1  if x > 0.5:
2      x = 1
```

```
1  [x > 0.5] = 1
```

```
1  x[x > 0.5] = 1
```

Correct

---

1 / 1 points

7. Which piece of code returns the numerical indices of the first three elements of the one-dimensional array x that are greater than 1?

```
1  x[:3] > 1
```

```
1  (x > 1).nonzero()[0][:3]
```

Correct

```
1  (x > 1)[:3]
```

```
1  x[x > 1][:3]
```

---

1 / 1 points

8. What piece of code loads the file 'data.pickle', which contains a dict object, into the variable "data"? You can assume that the directory containing 'data.pickle' is in your path (i.e., is accessible).

*The end result should be that the variable data is a dict object.

```
import pickle
with open('data.pickle', 'rb') as f:
    data = f.open()
```

```
import pickle
data = pickle.open(f, 'rb')
```

```
import pickle
with open('data.pickle', 'rb') as f:
    data = f
```

```
import pickle
with open('data.pickle', 'rb') as f:
    data = pickle.load(f)
```

Correct

---

1 / 1 points

9. Suppose the dict called "data" has been set to {'a': 3, 'c': 9, 'b': 5}. How do you set the value corresponding to the key 'b' to 100?

```
data('b') = 100
```

```
set(data, b, 100)
```

```
data['b'] = 100
```

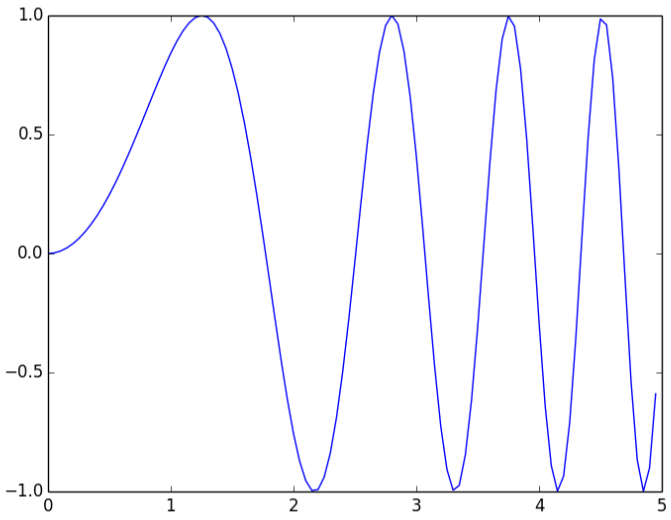
Correct

```
1  data.b = 100
```

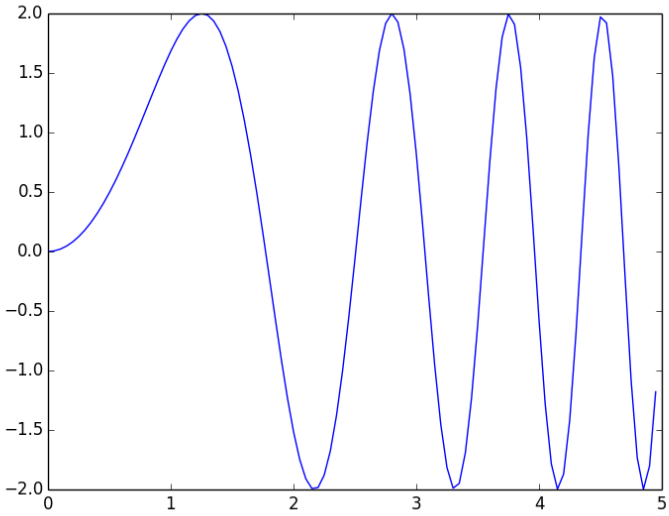
1 / 1 points

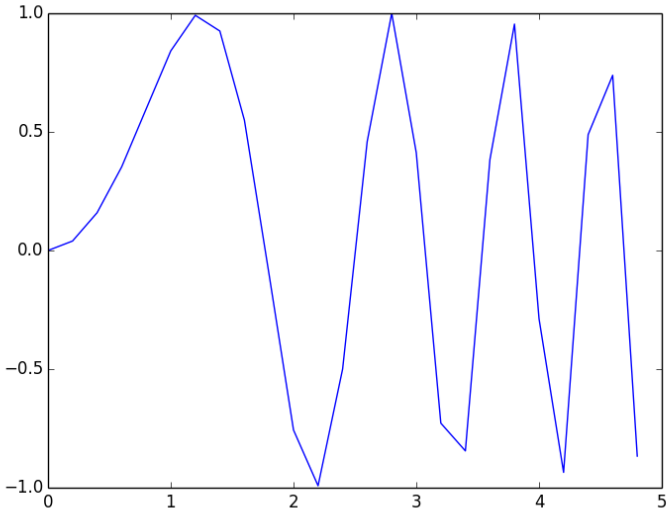
10. Which plot results when you run the following script?

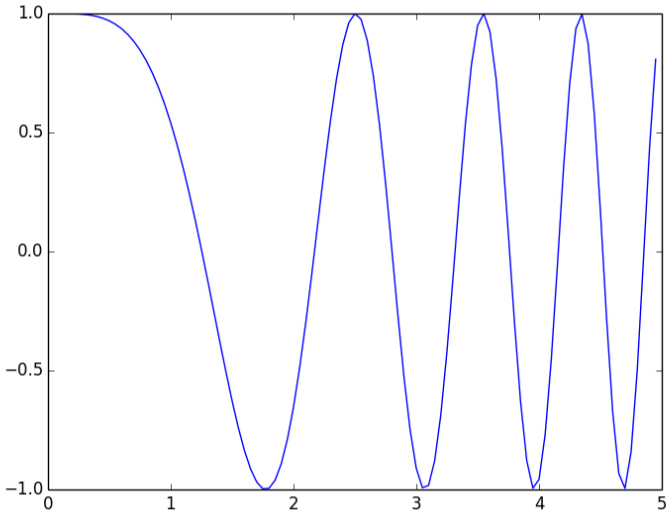
```
1  import numpy as np
2  import matplotlib.pyplot as plt
3
4  x = np.arange(0, 5, step=0.05)
5  y = np.sin(x**2)
6  plt.plot(x,y)
7  plt.show()
```



Correct


2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
0
1
2
3
4
5


1.0
0.5
0.0
−0.5
−1.0
0
1
2
3
4
5



✔ 1 / 1 points

11. Given the array x = np.array([1,2,3,4,5]), how do you create an array y that contains the cubes of all the elements of x?

- ○
```
1  y = x.^3
```
- ○
```
1  y = x^3
```
- ◉
```
1  y = x**3
```

Correct

✔ 1 / 1 points

12. What is the mathematical representation of x after this sequence of commands?

```
1  x = np.array([[1, 2, 3], [2, 3, 4]])
2  x *= 5
3  x -= 1
4  x[x > 10] = 0
5  x = x.T
```

- ○ $\begin{bmatrix} 4 & 9 \\ 9 & 0 \\ 0 & 0 \end{bmatrix}$

Correct

- ○ $\begin{bmatrix} 0 & 0 & 14 \\ 0 & 14 & 19 \end{bmatrix}$
- ○ $\begin{bmatrix} 4 & 9 & 0 \\ 9 & 0 & 0 \end{bmatrix}$
- ○ $\begin{bmatrix} 0 & 5 & 10 \\ 5 & 10 & 15 \end{bmatrix}$
- ○ $\begin{bmatrix} 4 & 9 & 14 \\ 9 & 14 & 19 \end{bmatrix}$
- ○ $\begin{bmatrix} 0 & 5 \\ 5 & 10 \\ 10 & 15 \end{bmatrix}$

✔ 1 / 1 points

13. Which of the following pieces of code sets the value of y to True if the value of x is either 2, 5, or 9, and to False otherwise? Check all that apply.

- ☐

```
1  y = False
2  if x in [2, 5, 9]:
3      y = True
```

Correct

- ☐

```
1  if x == [2, 5, 9]:
2      y = True
3  else:
4      y = False
```

Un-selected is correct

```
if x in [2, 5, 9]:
    y = True
else:
    y = False
```

Correct

```
y = x in [2, 5, 9]
```

Correct

---

1 / 1 points

14. What does the statement

```
import pdb; pdb.set_trace()
```

do when placed inside a Python script?

E.g.,

```
x = np.arange(5)
y = -np.arange(5)
x[y < -2] = 0
import pdb; pdb.set_trace()
x *= 9
print(x)
```

- Prints all of the local data to the console.
- Saves all of variables to a file called "pdb".
- Interrupts execution and temporarily gives control to the user.

Correct

- Halts the program until the user presses a key on the keyboard.