CSPB 3022 - Craven - Introduction to Data Science Algorithms

Started on	Monday, 22 January 2024, 10:29 PM
State	Finished
Completed on	Monday, 22 January 2024, 10:35 PM
Time taken	5 mins 35 secs
Grade	Not yet graded

Question **1**

Correct

Mark 5.00 out of 5.00

Which of the following are true statements about float values in Python?

Select ALL that apply for full credit.

Select one or more:

- [ ] a.
  Float values cannot be used with exponents.
- [x] b.
  Float values have limited precision of 15-16 decimal places. ✔
- [ ] c.
  The boolean statement 0.1+ 0.1 + 0.1 == 0.3 will output "True" in Python
- [x] d.
  After arithmetic with float values, the final few decimal places can be wrong. ✔
- [ ] e.
  Float values cannot be used inside NumPy functions.
- [ ] f.
  Float values have unlimited precision.
- [x] g.
  Float values have limited size. ✔

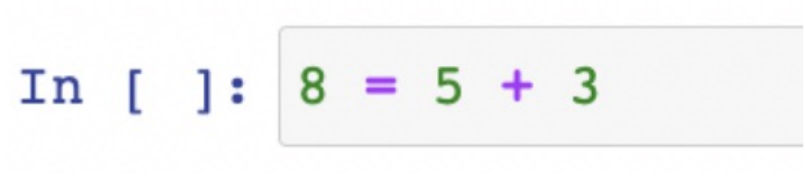
Your answer is correct.

Question **2**

Complete

Marked out of 4.00

When you run the following cell, Python will produce an error message.



Explain what is wrong with this code.

This code is attempting to assign the integer value '8' to the quantity 5 + 3. Although mathematically this is correct, this is incorrect in python due to the fact that we cannot assign an integer value to another value. We could use a variable name like 'eight' = 5 + 3 and then this would be valid. We could also use the logical 'OR' equals sign '==' in a separate context and it would be valid as well.

Question **3**

Correct

Mark 1.00 out of 1.00

Calculate the output that Python would print.

```
9/2
```

Answer: 4.5 ✔

Question **4**

Correct

Mark 1.00 out of 1.00

Calculate the output that Python would print.

```
9//2
```

Answer: 4 ✔

Question **5**

Correct

Mark 1.00 out of 1.00

Calculate the output that Python would print for each part.

```
import numpy as np
np.floor(9.7)
```

Answer: 9.0 ✔

Returns a float.

Question **6**

Correct

Mark 1.00 out of 1.00

Calculate the output that Python would print.

```
9%2
```

Answer: 1 ✔

Question **7**

Correct

Mark 1.00 out of 1.00

Calculate the output that Python would print.

```
9**2
```

Answer: 81 ✔

Question **8**

Complete

Marked out of 6.00

Let

$$h(x) = e^{cx}$$

Write Python code in the blanks provided below to define a function called *deriv* that takes numbers c and a as arguments and returns the value of $h'(a)$ (which is equivalent to $\frac{dh}{dx}\Big|_{x=a}$) as the output, (for this specific exponential function).
Include a documentation string in the function.

```
import numpy as np

  def ________________________
        """_____________________________________________________________"""


         return ____________________________
```

For this problem, you can type your answer below or submit a screenshot of code.

```
import numpy as np
def expDeriv(a, c):
""" This function is returning h'(a = x) where h(x) = exp(cx), h'(x) = c*exp(cx) """
    return c * np.exp(c * a)
```

Derivative Problem.png

Question **9**

Correct

Mark 4.00 out of 4.00

What is the output of the following code?

```
example = pd.Series([4, 5, 6], index=["one", "two", "three"])
example[example > 4].values
```

a. None of these

b. ✔

```
array([5, 6])
```

c.

```
Index(['two', 'three'], dtype='object')
```

d.

```
array([4, 5, 6])
```

e.

```
[5, 6]
```

Your answer is correct.

The result is of type NumPy array.

Question **10**

Correct

Mark 2.00 out of 2.00

```
weird = pd.DataFrame({1:["topdog","botdog"], "1":["topcat","botcat"]})
weird
```

	1	1
0	topdog	topcat
1	botdog	botcat

Predict the output of the following:

```
weird[1]
```

a.

	1	1
1	botdog	botcat

b.

	1	1
0	topdog	topcat
1	botdog	botcat

c.

```
0    topdog
1    botdog
Name: 1, dtype: object
```

d.

```
0    topcat
1    botcat
Name: 1, dtype: object
```

Your answer is correct.

Question **11**

Correct

Mark 2.00 out of 2.00

```
weird = pd.DataFrame({1:["topdog","botdog"], "1":["topcat","botcat"]})
weird
```

	1	1
0	topdog	topcat
1	botdog	botcat

Predict the output of the following:

```
weird["1"]
```

a.
```
0    topdog
1    botdog
Name: 1, dtype: object
```

b.

	1	1
1	botdog	botcat

c.

	1	1
0	topdog	topcat
1	botdog	botcat

d. ✔
```
0    topcat
1    botcat
Name: 1, dtype: object
```

Your answer is correct.

Question **12**

Correct

Mark 2.00 out of 2.00

```
weird = pd.DataFrame({1:["topdog","botdog"], "1":["topcat","botcat"]})
weird
```

	1	1
0	topdog	topcat
1	botdog	botcat

Predict the output of the following:

```
weird[1:]
```

a.

	1	1
1	botdog	botcat

b.

```
0    topdog
1    botdog
Name: 1, dtype: object
```

c.

```
0    topcat
1    botcat
Name: 1, dtype: object
```

d.

	1	1
0	topdog	topcat
1	botdog	botcat

Your answer is correct.

Question **13**

Correct

Mark 5.00 out of 5.00

Which of the following pandas statements returns a DataFrame with the same columns as babynames but only the rows of the first 3 baby names with Count > 250? (Select all that apply)

Select one or more:

a.

```
babynames[babynames["Count"] > 250,:].head(3)
```

b.

```
babynames.loc[babynames["Count"] > 250, :].iloc[0:3, :]
```

c.

```
babynames[babynames["Count"] > 250].head(3)
```

d.

```
babynames.loc[babynames["Count"] > 250, :].iloc[0:2, :]
```

e.

```
babynames.loc[babynames["Count"] > 250, :].head(3)
```

Your answer is correct.