

SI100B Python Programming Quiz 2

- **English-only Rule:** In this quiz, you may only answer the questions in English. Answers in other languages (e.g. Chinese) will result in 0 point for the corresponding question.
- Before you start, please fill your **FULL CHINESE name, student ID and your ShanghaiTech email address** in the related blanks in Question 0 **AND** the blanks on the top of every page. Failing to do so may result in 0 point of this quiz.
- Please **fill your answers in the table at the end of each section**. Answers written in other places will not be graded.

Question 0: Please Identify Yourself

Please **fill your FULL CHINESE name, student ID and your ShanghaiTech email address** in the related blanks below **AND** the blanks on the top of every page. Failing to do so may result in 0 point of this quiz.

Your FULL CHINESE name: _____

Your student ID: _____

Your ShanghaiTech email address: _____@shanghaitech.edu.cn

True or False (4 pts each, 72 pts in total)

Please decide whether the statements in the following questions are correct. If correct, fill in **T** in the following table. If wrong, fill in **F**.

1. In a `try` statement, there must be at least one `except` clause if there is no `finally` clause.
2. A file handle opened for read can be treated as an unordered sequence of strings where each line in the file is a string in the sequence.
3. Subclass could not inherit any private class attributes of Base classes.
4. A list is usually slower than a NumPy array during operations.

Please read the following piece of code and answer Question 5 -7

```
1 class Foo:
2     x = 1
3     def __init__(self):
4         [YOUR CODE]
5
6 print(Foo.x == Foo().x)
```

5. If `[YOUR CODE]` is replaced with `x = 2`, the program will output `True` if it is executed in an interactive Python 3 interpreter.
6. If `[YOUR CODE]` is replaced with `Foo.x = 2`, the program will output `True` if it is executed in an interactive Python 3 interpreter.
7. If `[YOUR CODE]` is replaced with `self.x = 2`, the program will output `True` if it is executed in an interactive Python 3 interpreter.
8. `__init__()` is an instance method.

9. The first parameter of all instance methods is bound to the instance object. The name of the first parameter must be `self`. Otherwise, an error will occur during execution.
10. Calling a class method on an instance object never affect attributes of other instances.
11. Private attributes in a module cannot be imported using `from [module_name] import *` (Note: `[module_name]` represents the name of the module to be imported).
12. Function `open()` returns a "file handler", which is a variable used to perform operations on the file.
13. Sub class always inherits all public instance variables of the Base class.
14. In NumPy, the function `savez(file, *args, **kwargs)` saves arrays into a file in `.npz` format.
15. A NumPy `ufunc` (i.e. universal function) is a "vectorized" wrapper for a function that takes a fixed number of specific inputs and produces a fixed number of specific outputs.
16. Either a dictionary or a 2d NumPy array could be used to create a Pandas `DataFrame`.
17. Lists are homogenous while NumPy arrays are heterogeneous.
18. If the following program is executed by an interactive Python 3 interpreter:

```

1  import numpy as np
2
3  a = np.array(
4      [[1, 2, 3],
5      [4, 5, 6]])
6  num = 2
7
8  print(a / num)

```

the program will output:

```

1  [[0.5  1.   1.5]
2   [4.   5.   6. ]]

```

Please fill your answers to questions in this section in the table below.

Question 01	Question 02	Question 03	Question 04	Question 05	Question 06

Question 07	Question 08	Question 09	Question 10	Question 11	Question 12

Question 13	Question 14	Question 15	Question 16	Question 17	Question 18

Multiple Choices (20 pts)

Attention:

Each of the follow questions has **only one correct answer**.

Question 19 (6 pts)

What is the behavior of the following program? Assume that the code is written in a file and being executed in a terminal.

```
1  try:
2      1 +
3  except:
4      print('good for you')
5  finally:
6      print('goodbye world')
```

- A. Only raises `SyntaxError`
- B. Only prints `goodbye world`
- C. Only prints `good for you`
- D. Prints `good for you`, then prints `goodbye world`
- E. Prints `goodbye world`, then prints `good for you`
- F. Prints `goodbye world`, then raises `SyntaxError`

Question 20 (6 pts)

Evaluate the output of the following code

```
1  class Foo:
2      def __init__(self):
3          self.k = 10
4          self.bar()
5          print(self.k)
6
7      def bar(self):
8          self.k = 2 * self.k
9
10 class Fofoo(Foo):
11     def __init__(self):
12         self.k = 20
13         Foo()
14         self.bar()
15         print(self.k)
16
17     def bar(self):
18         self.k = 3 * self.k
19
20 class Baz(Fofoo):
21     pass
22
23 foo = Baz()
```

A.

```
1  20
2  40
3  40
```

B.

1	20
2	60

C.

1	30
2	60

D.

1	30
2	30
3	90

E.

1	20
2	20
3	60

F.

1	90
2	180

Question 21 (8 pts)

Read the following code snippet in the file `bar.py`, determine what will be printed on your console.

```

1  class BarError(BaseException):
2      pass
3
4  class BarZeroEncountered(BarError):
5      pass
6
7  def bar(a, b=1, *c, **d):
8      print('a:', a)
9      print('b:', b)
10     print('c:', c)
11     print('d:', d)
12     if b == 0:
13         raise BarZeroEncountered('`b` could not be zero.')
14
15 if __name__ == '__main__':
16     try:
17         bar(1, 0, 1, 2, 3, x=1, y=2, z=3)
18     except BarZeroEncountered as e:
19         print("Emmm,", e)
20     except BarError as e:
21         print("Hummm,", e)
22     except Exception as e:
23         print("Ha,", e)

```

Please choose the correct output from the following options if the program is run as `python3 bar.py`.

A.

```
1 a: 1
2 b: 1
3 c: (1, 2, 3)
4 d: {'x': 1, 'y': 2, 'z': 3}
```

B.

```
1 a: 1
2 b: 0
3 c: (1, 2, 3)
4 d: {'x': 1, 'y': 2, 'z': 3}
5 Emmm, `b` could not be zero.
```

C.

```
1 a: 1
2 b: 0
3 c: (1, 2, 3)
4 d: {'x': 1, 'y': 2, 'z': 3}
5 Emmm, BarZeroEncountered
```

D.

```
1 a: 1
2 b: 0
3 c: (1, 2, 3)
4 d: {'x': 1, 'y': 2, 'z': 3}
5 Ha, `b` could not be zero.
```

E.

```
1 a: 1
2 b: 0
3 c: [1, 2, 3]
4 d: {'x': 1, 'y': 2, 'z': 3}
5 Hummm, `b` could not be zero.
```

F

```
1 a: 1
2 b: 0
3 c: (1, 2, 3)
4 d: {'a': 1, 'b': 1, 'c': (1, 2, 3) 'x': 1, 'y': 2, 'z': 3}
5 Hummm, `b` could not be zero.
```

Please fill your answers to questions in this section in the table below.

Question 19	Question 20	Question 21

Blank Fillings

Question 22 (2 pts each, 8 pts in total)

Read the code below. What gets printed for each call to `print()`?

```
1 x = 0
2 def foo():
3     x = 1
4     def bar():
5         nonlocal x
6         x = 2
7         def baz():
8             global x
9             print(x)
10            x = 3
11        baz()
12        print(x)
13    bar()
14    print(x)
15
16 foo()
17 print(x)
```

Please fill your answers in the following table in the order of execution of every call to `print()`.

1st call	2nd call	3rd call	4th call

End of the Quiz