Examination

TOTAL POINTS 40

1. In Python, there is no need to define the type of variable. The type of a variable is determined by the “value” and assignment will done via reference of the variable. 1 point

- ○ F
- ◉ T

2. “sum-1” is a valid identifier in Python. 1 point

- ◉ F
- ○ T

3. In loop control statements of Python, there are control flow keywords such as break,continue, and pass. 1 point

- ○ F
- ◉ T

4. Definition of function arguments of Python consists of positional arguments and keyword arguments. Keyword arguments allow the caller to specify parameter by name and even provide in a different order. 1 point

- ○ F
- ◉ T

5. If we want to insert x into a list “lst”, we can use “lst.append(x) or “lst[len(lst):]=[x]. 1 point

- ◉ T
- ○ F

6. Executing range(N1, N2) will generate a total of N2-N1+1 integers. 1 point

- (•) F
- ( ) T

7. “for” statement in Python can be used to iterate on any sequence, for example, list, string and tuple. 1 point

- ( ) F
- (•) T

8. Regarding the “else” statement used together with a loop statement, if the code inside a loop block abort the loop using a “break” statement, the else statement will be executed. 1 point

- (•) F
- ( ) T

9. The get() function in Requests library can be used to scrape data through a webpage. If the data needs to be parsed, BeautifulSoup library and re module are often used. 1 point

- ( ) F
- (•) T

10. The built-in functions of the dictionary in Python don’t include append() function. If a dictionary needs to be update, the update() function can be used. 1 point

- (•) T
- ( ) F

11. In Python, if a file is opened with mode “r+”, the file pointer will be at the beginning of the file. A call to f.write(‘hahaha’) will insert the string “hahaha” at the beginning of the file. 1 point

- (•) F

- T

12. There is an important broadcasting idea when using the ndarray array in NumPy to solve various scientific computing problems, but pay special attention to the dimensional changes of the array during the operation to ensure that subsequent broadcasting can be performed. So the keepdims parameter is often used in some functions / methods. You can set this parameter to True to preserve the two-dimensional nature of the array (the dimension of the axis that is reduced in the result is 1). 1 point

- F
- T

13. In a statement like “quotesdf = quotesdf.drop(['date'], axis =)”, the argument of “axis” can only be 0 or 1. “0” represents an operation of a certain column in DataFrame; “1” represents an operation of a certain row in DataFrame. 1 point

- F
- T

14. Data normalization is often used to solve problems with different dimensions and large numerical ranges. 1 point

- F
- T

15. In the qualitative distribution analysis of two-dimensional table data, the value_counts () method or bar chart is often used to show the classification ratio of the data. 1 point

- F
- T

16. Which of the following can NOT be used as the key of a dictionary? 1 point

- 123

- 'num'
- tupleA = ('sum')
- listA = ['className']

17. Which of the following is NOT among the three basic control structures of structured programming? 1 point

- Selection
- Loop
- Recursion
- Sequence

18. Which of the following descriptions is NOT correct about the numeric operation of Python? 1 point

- The result of 10/3 == 3 in Python 3.x is true.
- Python supports augmented assignment operators like “+=” and “%=”.
- The operator “%” is to calculate the remainder.
- Complex operation is supported as built-in in Python, which may be represented with “j” or “J”.

19. Which of the following descriptions is NOT correct about the string processing? 1 point

- When assigning a string include single-quote mark or double-quote mark, operator ‘r’ can be used if escape character is not desired.
- The symbol “\” may be used as the escape character. For example, both 'doesn\'t' and "doesn't" represent the string “doesn’t”.
- The print state of print('C:\file\name') is C:\file\name.
- Any sequence of characters that is enclosed by single quotes ('...') or double quotes ("...") is a string in Python.

20. Which of the following is correct about string processing? 1 point

- [x] Python Operator '+' is to concatenate two strings. For the code snippet below, the result is Python.

```
>>> prefix = "Py"
>>> prefix + 'thon'
```

- [ ] Given a string "apple", the statement 3*"apple" will generate "3apple".
- [ ] Strings have indexes with themselves. For the variable word = 'Python', word[1] is the character "y", but word[-1] will cause the display of error of out-of-range.
- [ ] The index of a string has two boundaries; both the front boundary and the rear boundary are included.

21. Which of the following descriptions is NOT correct about the list? 1 point

- [ ] Operator "==" can be used to compare two lists.
- [x] Like strings, lists are also immutable.
- [ ] The "+" symbol may be used to join two lists.
- [ ] Lists in Python can be nested, to form a two-dimensional list.

22. As for the function ask(), which of the following calls is NOT correct? 1 point

```
def ask(prompt = "Do you like Python? ", hint = "yes or no"):
    while True:
        answer = input(prompt)
        if answer.lower() in ('y', 'yes'):
            print("Thank you")
            return True
        if answer.lower() in ('n', 'no'):
            print("Why not ")
            return False
        else:
            print(hint)
```

- [ ] The functional call of "Do you like Python" has the same effect as that of "ask()".
- [ ] Call function ask() and input x, "yes or no" will be printed. If provide "y", "Thank you" will be printed and the execution of ask() will end. Meanwhile the return value is True.

- [x] Call function ask() and input N, “yes or no” will be printed to ask for more input.
- [ ] answer.lower() calls the built-in function “lower()” of “string”, converting the input into lower case letters.

23. Which of the following operational results of built-in data structures of Python is NOT correct? 1 point

- [ ] l = [1, 2, 3, 4]; l.rerverse(); then l[1] is 3.
- [ ] l = [1, 2, 3, 4]; l.pop(1); then l is [1, 3, 4].
- [x] l = [1, 2, 3, 4]; l.insert(2, -1); then l is [1, 2, -1, 4].
- [ ] l = [1, 2, 3, 4]; l.pop(); then l.index(3) is 2.

24. Which of the following operational results of built-in data structures of Python is correct? 1 point

- [ ] basket = ['apple', 'banana', 'apple', 'orange'] ; fruit = set(basket);

  fruit2 = set(['apple', 'melo']); the result of len(fruit | fruit2) is 5.
- [ ] basket = ['apple', 'banana', 'apple', 'orange'] ; fruit = set(basket); len(fruit) Then the operational result of len(fruit) is 4.
- [ ] l = [1, 2, 3, 4, 5]; del l[2:4]; then, after operation, l is [1, 2, 3].
- [x] l = [2, 1, 3, 5, 4]; l.remove(3); l.sort(); then, after operation, l is [1, 2, 4, 5].

25. Which of the following operational results of built-in data structures of Python is correct? 1 point

- [ ] scores = {'Jack': 90, 'Mike': 80, 'Jay': 85, 'Bill': 60}; del scores['Bill'];

  the result of len(scores) is 6.
- [ ] scores = {'Jack': 90, 'Mike': 80, 'Jay': 85, 'Bill': 60}; s = dict(Jack=90, Mike=80, Jay=85, Bill=60); then, the judgment result of scores == s is False.
- [x] scores = {'Jack': 90, 'Mike': 80, 'Jay': 85, 'Bill': 60}; the operational result of sorted(scores.keys()) is ['Bill', 'Jack', 'Jay','Mike'].
- [ ] it is impossible to execute the command: scores['Bill']=90; the reason is that there is already a value “90” in the original dictionary.

26. Which of the following descriptions is NOT correct? 1 point

- When an element is accessed in loops in sequences, for acquiring the index of element simultaneously, it is feasible to use the function “enumerate()”, like “for x in enumerate(lst)”.
- It’s possible to iterate the list and modify the list itself at the same time, for example, the code below:

```
words = ['I', 'love', 'Python']
for w in words:
    if len(w) > 4:
        words.insert(0, w)
```

- To iterate a dictionary, the function “items()” may be used to simultaneously retrieve values of “key, value”, for example, for k, v in scores.items().
- To iterate sequence elements in the reverse order, it is feasible to apply the function “reversed()” to that sequence.For example, for i in reversed(lst).

27. In Python, which of the following descriptions about a function is NOT correct? 1 point

- In Python, the “return” statement in functions can return many values in form of “tuple”.
- A function in Python will have one and only one return statement.
- In Python, a function is an object.
- In Python, the value of default argument may be modified.

28. Which of the following descriptions is correct about Python? 1 point

- An asterisk “*” can be added before a function argument name, so that all the arguments transferred by the user can be collected and then used. The effect of asterisk here is to collect the other positional arguments, which realizes variable-length arguments.
- In Python, if a function returns more than 1 value, the system will, by default, process these value(s) into a dictionary.
- In Python, the implementation of recursion of an algorithm can often be equivalently represented by loop realization, but, in most cases, the efficiency of recursion expression is often higher.

- Recursive call is not allowed in loop blocks.

29. In the following function to calculate Fibonacci numbers, which represents the nth number of the Fibonacci number list? 1 point

```
def fib(n):
    a, b = 0, 1
    count = 1
    while count  < n:
        a, b = b, a+b
        count = count + 1
```

- a+1
- b
- b+1
- a

30. Which of the following descriptions is NOT correct? 1 point

- Open a text file, f = open('test.txt', 'r+'); then, “f.seek(5)” means to find the number “5” in the opened file.
- Open and read a text file, with “f = open('test.txt', 'r+')”; f.read(); the function “read” without any argument is to read the entire text file and return the contents.
- In Python, sequences of the same type can be compared and sorted according to the dictionary order. For example, the operational result of (1, 2, 3, 4) < (1, 2, 4) is True.
- For string formatting, the result of '{:.2f}'.format(math.pi) is the same as that of '%.2f' % math.pi.

31. Which of the following descriptions is NOT correct about the common data structures in SciPy? 1 point

- Series can be regarded as enhancement of original dictionary of Python in pandas, so the index of each element inside a Series object can not be the same as any other one.。

- SciPy includes components like NumPy, Matplotlib and pandas, among which NumPy is an essential package for high performance computing and analysis, serving as a base to construct other advanced tools on top of it.
- DataFrame can be regarded as a Series set sharing the same index.
- ndarray is an object of multidimensional array; "import numpy as np; matrix = np.ones((3, 4))" creates one 3*4 ndarray of two-dimensional array.

32. Which of the following is the order of applying object-oriented concept in programming 1 point

- class defining — instance creating — use attributes or methods through the instance
- instance creating — use attributes or methods through the instance — class defining
- **instance creating — class defining — use attributes or methods through the instance**
- class defining — use attributes or methods through the instance —instance creating

33. Which of the following is the wrong option in the data reduction statement? 1 point

- PCA is a common feature reduction method.
- **Histograms are often used for value reduction.**
- z-score is a common value reduction method.
- Sampling is often used as a value reduction method.

34. As for the function ask(), please fill in the following blank to make the operation successful under the context in the question. Please fill in the first blank. 1 point

```
def ask(prompt, hint = "yes or no", chance = _________):
    while chance > 0:
        answer = input(prompt)
        if answer.lower() in ('y', 'yes'):
            print("Thank you")
            return True
        if answer.lower() in ('n', 'no'):
            print("Why not ")
            return False
        else:
            chance -= 1
            print(_________)
    print("Sorry, you have tried too many times.")

>>> ask("Do you like SciPy?")
Do you like SciPy? What?
yes or no

Do you like SciPy? en
yes or no
Sorry, you have tried too many times.
```

no

35. Please fill in the second space of Question 34. 1 point

yes

36. There's a file "test.txt" in the current directory with the content below: 1 point

Life is short, you need Python.

Simple is better than complex.

Execute the following statement:

```
with open('test.txt', 'rb+') as fp:
    fp.readline()
    fp.seek(10, 1)
    print(fp.readline())
```

Please write down the result(only the string is needed, ignoring b").

b's better than complex.'

37. The list “fruits” keeps the names of all kinds of fruit on sale in alphabetical order, for example, fruits = ['apple', 'banana', 'cherry','banana', 'peach', 'pear','peach', 'cherry']. Define a function to count how many times each kind of fruit is sold. The result is expected to save in a dictionary in the form of {'pear': 1, 'banana': 2, 'cherry': 2, 'peach': 2, 'apple': 1}.

1 point

```
d = {}
fruits_set = set(fruits)
for item in fruits_set:
    d[item] = 0
    for i in range(len(fruits)):
        if item == fruits[i]:
            d[item] += 1
```

It will be better if the problem can be solved in a Python way. For instance, the resolution can be changed to:

```
d = {}
for item in fruits:
    d[item] = fruits._________(item)
```

Please fill in the blank with an appropriate method.

Enter answer here

38. The problem of Question 37 also can be solved in the way below:

1 point

```
d = {}
for item in fruits:
    d[item] = d._________(item, 0) + 1
```

Enter answer here

39. Given a list aList and a tuple bTuple, which of the following statement regarding usage of functions and objects is NOT correct? 1 point

- ○ sorted(aList)
- ◉ bTuple.sort()
- ○ sorted(bTuple)
- ○ aList.sort()

40. If a function is defined as below, which of the following input can yield a result of 21? 1 point

```
def compute(*numbers):
    s = 1
    for n in numbers:
        s = s * n + n
    return s
```

- ◉ nums = (3, 3); compute(*nums)
- ○ compute([3, 2, 1])
- ○ nums = [1, 2, 3]; compute(nums)
- ○ compute([3, 3])

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