

BRONX COMMUNITY COLLEGE
of the City University of New York
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

CSI31

Sample Midterm Exam

NAME _____

Directions: Answer all questions. You may refer to the textbook, handouts, or notes taken in class. Do not use any computer or calculator. If you prefer, each question can be answered in the exam booklet provided. Hand in all papers, with answers clearly marked and with your name on each sheet. The questions are worth the points indicated.

1. (10 points) Answer TRUE or FALSE:
 - i. In Python, a reserved word can be used as a variable name.
 - ii. A large part of computer science is devoted to the study of algorithms.
 - iii. The statement `from math import *` includes many math functions into a program, but no constants.
 - iv. Mathematical functions are implemented in the hardware of a computer using base 2.
 - v. The `str` class is a mutable class.
 - vi. The most precise representation of an amount of money, in a Python, program, is as a `float` value.
 - vii. For a program to run on a computer it must be translated into C++.
 - viii. The Python function call `ord(c)` returns the numeric code of the 1-character string `c`.
 - ix. A file object in Python is created by calling the function `open`.
 - x. The value of the expression `[1,2,3] * 2` is `[2,4,6]`.

2. (10 points) Select the correct choice(a, b, c, or d):
- i. Which of the following is not used as an operator in Python:
(a) / (b) %% (c) % (d) //
 - ii. The largest integer value that can used in a Python program
(a) is 32 bits in size (b) is 64 bits in size (c) Can have over 100 digits (d) does not exist: there is no 'largest integer'
 - iii. Which of the following is not a reserved word used in Python loops:
(a) loop (b) for (c) in (d) while
 - iv. Which of the following is not part of a computer's hardware architecture:
(a) CPU (b) operating system (c) main memory (d) secondary memory
 - v. A computer's CPU understands instructions that are written in
(a) Python (b) source code (c) English (d) machine language
 - vi. In Python, what is the result of the expression `2.0 + 5 // 2`?
(a) 4 (b) 4.0 (c) 4.5 (d) none of the above
 - vii. What data type does the strings split method return?
(a) A string. (b) A list of strings. (c) None. (d) An int.
 - viii. Which of the following best describes what an object is?
(a) It is a group of data. (b) It is a group of methods.
(c) It is a group of data along with methods for operating on that data.
(d) It is a geometric shape
 - ix. If you want to use the accumulator pattern to add up a sequence of numbers, which of the following would be the correct initialization statement for the accumulator variable?
(a) `total = -1` (b) `total = 0` (c) `total = 1` (d) `total = []`
 - x. What does an assignment statement do?
(a) It represents an algebraic equation that the computer solves.
(b) It causes the computer to store the result of the statements expression in memory so you can use the result in a later Python statement.
(c) It outputs the result of the statements expression to the screen.
(d) It asks the user to enter a value for the assignments expression.

3. (10 points) Explain the difference between a program that is compiled and one that is interpreted. Which will run faster? Why?
4. (10 points) You are at an early stage in designing a program. Give an advantage in expressing the algorithm pseudocode instead of Python. Then give an advantage in using Python over pseudocode. Give reasons in each case.
5. (10) Write a Python statement that asks the user to enter an integer between one and ten and then assigns that value to the variable `n`.
6. (10 points) Give the output of this code:

```
result = 0
for i in range(1,5):
    result = result + i*i*i
    print(i, result)
```

7. (10 points) After the statements (`str1 = 'abcde'` and `str2 = 'fgh'`), what is the value of the expression `str1[1:4]*3+str2[-1]`?
8. (10 points) Name at least 3 steps in developing a software system, and describe them briefly.
9. (10) Write a Python program which allows a user to enter 5 `int` values and print their total.
10. (10 points) A Python interactive session using the graphics package includes the following commands. Draw a snapshot, as reasonably neatly as possible, of what appears on the `Graphwin` object, `paper`, after all the statements are executed. Your drawing should include all relevant size and position information.

```
>>> from graphics import *
>>> paper=Graphwin()
>>> c=Circle(Point(50,50), 30)
>>> paper.draw(c)
>>> r=Rectangle(Point(100,100), Point(150, 150))
>>> paper.draw(r)
```