CPSC 231 Midterm 1

Duration: 40 minutes

10 February 2017

• This exam has 26 questions and 10 pages.
• You may use one single-sided 8.5x11” piece of paper with whatever you want written on it. Apart from that, this exam is closed book. No notes, books, calculators or electronic devices, or other assistance may be used.
• Mark your answers on the supplied answer sheet.
• If you think there are multiple correct answers to a question, select the best answer.

Due to the number of people in the room, you must stay for the entire exam.
Part 1

1. This code appeared in the lecture notes.

   ```python
   for i in range(10):
       print i
   ```

   (N:Q21,O:Q19,R:Q9)

   (A) True
   (B) False

2. What does this code print when run?

   ```python
   import random
   random.seed(42)
   x = random.randint(1, 10)
   random.seed(42)
   y = random.randint(1, 10)
   for i in range(1 + x - y):
       print(i)
   ```

   (A:Q16,B:Q9,C:Q10)

   (A) Nothing
   (B) It prints 0
   (C) It prints 0, then 1
   (D) It prints a (pseudo)random number of values
   (E) There is an error because you can't call seed twice

3. What is the value of \(L\) after this code is run?

   ```python
   L = [2]
   L.append(4)
   L = [3] + L
   L.append(L[1])
   ```

   (A:Q13,B:Q11,C:Q1)

   (A) \([3, 2, 4, 2]\)
   (B) \([2, 4, 3, 2]\)
   (C) \([3, 2, 4, 3]\)
   (D) \([3, 2, 4, 4]\)
   (E) \([3, 2, 4]\)

4. \(L = [1, 2, 3, 4, 5]\). How many of the following statements set \(x\) to the value 3?

   ```python
   x = L[0] + L[1]
   x = L[-1] + L[1]
   x = L[3] - L[-4] + L[0]
   ```

   (A:Q17,B:Q16,C:Q3)
5. What does the following code print, if it is given the input 42?

```python
x = input()  # line 1
x = x * 2    # line 2
x = x + 1    # line 3
print(x)     # line 4
```

(A: Q19, B: Q15, C: Q2)

(A) 85  
(B) 4242  
(C) 4243  
(D) There is an error at line 2  
(E) There is an error at line 3

6. What does this code draw when run?

```python
import turtle
for i in range(4):
    for j in range(2):
        turtle.fd(50)
        turtle.bk(50)
        turtle.lt(90)
```

(A: Q22, B: Q10, C: Q7)

(A) The symbol +  
(B) The symbol ×  
(C) The symbol *  
(D) The symbol ⊤  
(E) The symbol ⊥

7. How many of the following programs will yield the following image when they are run?
import turtle
for i in range(4):
    turtle.fd(100)
    turtle.lt(90)

import turtle
i = 0
while i <= 3:
    turtle.fd(100)
    turtle.lt(90)
    i = i + 1

8. How many of these expressions evaluate to True?

- True and False
- 'foo' != 'foo' or False
- 5 < 3 and len('foo') == 3
- 'foo' != 'foo' or (not False)

(A:Q15,B:Q13,C:Q11)

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

9. How many of these expressions evaluate to 15?

- 3 * 5
- 9 // 2 + 11
- 2 + 5 * 2 + 3
- 9 / 2 + 11

(A:Q12,B:Q14,C:Q8)

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

10. Which of these programs, given an integer as input, will correctly print whether that integer is positive, negative, or zero?
# Program 1
n = int(input('Integer? '))
for i in range(-1, n):
    s = 'n is positive'
for i in range(n):
    s = 'n is zero'
for i in range(-n):
    s = 'n is negative'
print(s)

# Program 2
n = int(input('Integer? '))
for i in range(-1, n):
    s = 'n is negative'
for i in range(n):
    s = 'n is positive'
for i in range(-n):
    s = 'n is zero'
print(s)

# Program 3
n = int(input('Integer? '))
for i in range(-1, n):
    s = 'n is zero'
for i in range(n):
    s = 'n is positive'
for i in range(-n):
    s = 'n is negative'
print(s)

# Program 4
n = int(input('Integer? '))
for i in range(-1, n):
    s = 'n is zero'
for i in range(n):
    s = 'n is negative'
for i in range(-n):
    s = 'n is positive'
print(s)

(A:Q14,B:Q8,C:Q6)

(A) Program 1
(B) Program 2
(C) Program 3
(D) Program 4

11. Which of the following programs is the best way to print the circumference of a circle with radius $r$?

# Program 1
r = 45
pi = 3.14159
C = 2 * pi * r
print('circumference is', c)

# Program 2
import math
r = 45
C = 2 * math.pi * r
print('circumference is', c)

# Program 3
from math import pi
r = 45
C = 2 * math.pi * r
print('circumference is', c)

# Program 4
from math import *
C = 2 * math.pi * r
print('circumference is', c)

(A:Q18,B:Q17,C:Q5)

(A) Program 1
(B) Program 2
(C) Program 3
(D) Program 4

12. The variable $n$ is a positive integer representing a number of seconds. Which of the following code would result in it being displayed correctly as minutes and seconds? For example, if $n$ is 150, the output should be 2 : 30.

(A:Q14,B:Q14,C:Q15)
# Code 1
seconds = n % 60
minutes = n // 60
print(minutes, ':', seconds)

# Code 2
seconds = n // 60
minutes = n // 60
print(minutes, ':', seconds)

# Code 3
seconds = n // 60
minutes = n % 60
print(minutes, ':', seconds)

# Code 4
seconds = n % 60
minutes = n // 60
print(minutes, ':', seconds)

(A:Q11,B:Q18,C:Q12)

(A) Code 1
(B) Code 2
(C) Code 3
(D) Code 4

Part 2

The dir function that you have seen returns a list of strings; calling dir on an imported module will yield a list of strings that are names available in the module. Use the following code to answer the questions in this section. It should print all the names in the xyzzy module containing 'foo' in them someplace.

AAA
for name in BBB:
    if CCC:
        print(name)

13. What should AAA be replaced with? (A:Q8,B:Q20,C:Q21)
   (A) import xyzzy
   (B) from xyzzy import dir
   (C) from xyzzy import *
   (D) from xyzzy import name
   (E) Nothing

14. What should BBB be replaced with? (A:Q9,B:Q21,C:Q22)
   (A) dir(xyzzy)
   (B) dir()
   (C) range(xyzzy)
   (D) range(dir)
   (E) range(len(dir(xyzzy)))

15. What should CCC be replaced with? (A:Q10,B:Q22,C:Q23)
   (A) 'foo' in name
   (B) 'foo' not in name
   (C) 'foo' == name
   (D) 'foo' != name
   (E) 'foo' = name
Part 3

A data file’s format begins with the number of data values, followed by that many integers. You have seen this format before in lectures and tutorials. The data file, called datafile, currently contains

```
4
15
20
9
-1
```

The program in this section is run as

```
python3 program.py < datafile
```

It is supposed to print the total of all the data values except the first one; in this particular data file, 15 would not be added to the total. Starting with the following code:

```python
first = True
n = int(input())
sum = 0
for i in AAA:
    data = int(input())
    if BBB:
        CCC
        DDD
    sum = sum + data
print(sum)
```

16. What should `AAA` be replaced with? (A:Q1,B:Q4,C:Q13)
   (A) `range(n)`
   (B) `n`
   (C) `range(n-1)`
   (D) `range(n-2)`
   (E) `range(n+1)`

17. What should `BBB` be replaced with? (A:Q2,B:Q5,C:Q14)
   (A) `first == True`
   (B) `first == False`
   (C) `first = True`
   (D) `first = False`
   (E) `not first`

18. What should `CCC` be replaced with? (A:Q3,B:Q6,C:Q15)
   (A) `first = False`
   (B) `first == False`
   (C) `first = True`
   (D) `first == True`

19. What should `DDD` be replaced with? (A:Q4,B:Q7,C:Q16)
   (A) `continue`
   (B) `break`
   (C) `Nothing`
   (D) `sum = sum + data`
Part 4

A data file’s format begins with the number of data values, followed by that many integers. You have seen this format before in lectures and tutorials. The data file, called datafile, currently contains

```
4
15
20
9
-1
```

The program in this section is run as

```
python3 program.py < datafile
```

It is supposed to print the data values in reverse order. For example, the output for this data file should be

```
-1
9
20
15
```

Starting with the following code:

```python
L = []
n = int(input())
for i in AAA:
    data = int(input())
    BBB
while n > 0:
    CCC
```

20. What should AAA be replaced with? (A:Q5,B:Q1,C:Q24)

(A) `range(n)`
(B) `n`
(C) `range(n-1)`
(D) `range(L)`
(E) `len(L)`

21. What should BBB be replaced with? (A:Q6,B:Q2,C:Q25)

(A) `L.append(data)`
(B) `L = L + data`
(C) `data.append(L)`
(D) `L = data + L`
(E) `append(data)`

22. What should CCC be replaced with? (A:Q7,B:Q3,C:Q26)

(A) `n = n - 1`
    `print(L[n])`
(B) `print(L[n])`
    `n = n - 1`
(C) `n = n - 1`
    `print(L[n-1])`
(D) `n = n - 1`
    `print(L[n+1])`
(E) `print(L[n+1])`
    `n = n - 1`
Part 5

A data file contains words, one per line, ending with the sentinel end. You have seen this format before in lectures. The data file is called datafile, and the programs in this section are run as

```
python3 program.py < datafile
```

Starting with the following code:

```
while AAA:
    line = input()
    # check for sentinel
    BBB
    if line == 'print':
        print(last)
    else:
        last = line
```

23. What should AAA be replaced with? (A:Q23,B:Q23,C:Q17)

(A) True  
(B) False  
(C) line != 'end'  
(D) line == 'end'  
(E) line != end

24. What should BBB be replaced with? (A:Q24,B:Q24,C:Q18)

(A) if line == 'end':
    break  
(B) if line == end:
    break  
(C) if line != 'end':
    continue  
(D) if line == 'end':
    continue

25. If the contents of the data file were the following, what would the program output when run?

```
foo
bar
print
end
```

(A:Q25,B:Q25,C:Q19)

(A) foo  
(B) bar  
(C) print  
(D) end  
(E) Something else not listed here

26. If the contents of the data file were the following, what would the program output when run?
foo
bar
print
print
end

(A:Q26,B:Q26,C:Q20)

(A) foo, then bar
(B) bar, then bar
(C) foo, then foo
(D) bar, then print
(E) Something else not listed here

Answer Key

Q1: B; Q2: B; Q3: A; Q4: D; Q5: E; Q6: A; Q7: C; Q8: B; Q9: D; Q10: C; Q11: B; Q12: D; Q13: A; Q14: A; Q15: A; Q16: A; Q17: A; Q18: A; Q19: A; Q20: A; Q21: A; Q22: A; Q23: A; Q24: A; Q25: B; Q26: B.

End of questions. Remember that you must stay for the entire exam.