CPSC 231 Midterm 2

Duration: 40 minutes

17 March 2017

- This exam has 23 questions and 8 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.

1
Part 1

1. What is printed when this code is run?

```python
def foo():
    x = 5
    x = foo()
    print(x)
```

(A) None
(B) 5
(C) 5, then 5 again
(D) Nothing
(E) There is an error when this code is run

2. How many times is \( X \) printed when this code is run?

```python
def foo():
    print('X')
    return 'Y'
def bar():
    print('X')
    X = foo()
    print(X)
def baz():
    print('X')
    bar()
```

(A) There is an error when this code is run
(B) 1
(C) 2
(D) 3
(E) 4

3. What is printed when this code is run?

```python
x = 123
def x42(x):
    x = 42
    print(x)
def x11():
    x = 11
    print(x)
x42(x)
x11()
print(x)
```

(A) 42, 42, and 123, in that order
(B) 42, 11, and 11, in that order
(C) 42, 11, and 123, in that order
(D) 42, 42, and 11, in that order
(E) 42, 11, and 42, in that order
4. What is printed when this code is run?

```python
x = 123
def x42(x):
    x = 42
    print(x)
def x11():
    global x
    x = 11
    print(x)
x42(x)
x11()
print(x)
```

(A) 42, 42, and 123, in that order
(B) 42, 11, and 11, in that order
(C) 42, 11, and 123, in that order
(D) 42, 42, and 11, in that order
(E) 42, 11, and 42, in that order

5. How many times is X printed when this code is run?

```python
class act:
    def __init__(self):
        self.char = 'X'
        print('X')
    def my(self, andi):
        print(self.char)
over = act()
over.my('deadbody')
ex = act()
```

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

6. How many of the following programs will output the letters a, b, c, d, e, f, g, h, and i, in that order, when they are run?
Part 2

Use the definitions below to answer the questions in this section.

L = [1, 2, 3, 4]
D = {2: 7, 3: 4, -1: 3, 0: 5}
T = (4, 3, 2)
S = '3.14159'

7. How many of these four variables’ types are mutable?
   (A) 0
   (B) 1
   (C) 2
   (D) 3
   (E) 4

8. What are the contents of X after this code is run?
X = [ ]
for ty in [L, D, T, S]:
    X.append(len(ty))
X.sort()

(A) [3, 4, 4, 7]
(B) [1, 3, 4, 4]
(C) [1, 3, 4, 8]
(D) [3, 4, 7, 8]
(E) Something else not listed here

9. How many of these expressions are equal to 5?

D[-1]
L[-1] + L[0]

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

10. How many of these expressions are equal to True?

4 in D
4 in L
'3' not in S[1:-1]
L[1] in D

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

11. What is S[0] * (D[0] - T[0] + L[0])?

(A) An error
(B) '33'
(C) 6
(D) 12
(E) '6'
Part 3

Recall the data file with fictitious student data that has been used a number of times as an example in class. The fields are tab-separated, and the data file ends with the sentinel EOF. The program in this section is run as

    python3 program.py < datafile

It is supposed to print the frequency with which different email domains occur. For example, given the data file

```
360283 Baranowski Georgia BIOL lilian@shaw.ca
682697 Crossley Rod BIOL noelle.alcantar@gmail.com
268501 Romeo Elijah ENGG wardl@hotmail.com
468795 Land Homer GEOG harknesse@shaw.ca
496111 Dowling Desiree BIOL oliverj@gmail.com
956629 Carrier Jeanne ARKY alba@shaw.ca
277759 Egan Ashley MATH tcbrammer@shaw.ca
EOF
```

the output is

```
shaw.ca 4
hotmail.com 1
gmail.com 2
```

Starting with the following code:

```python
SENTINEL = 'EOF'
AAA
def process(line):
    BBB
    fields = CCC
    email = DDD
    domain = EEE
    FFF
def readdata():
    GGG
    while True:
        line = input()
        HHH
        process(line)
III
for k in D:
    JJJ

12. What should AAA be replaced with?

   (A) D = [ ]
   (B) D = ( )
   (C) D = (,)
   (D) D = { }
   (E) Nothing

13. What should BBB be replaced with?

   (A) global D
   (B) D = { }
```
(C) \( D = ( ) \)
(D) \( D = [ ] \)
(E) Nothing

14. What should CCC be replaced with?
(A) \( \text{line.split('\t')} \)
(B) \( \text{line.split('/t')} \)
(C) \( \text{split(line)} \)
(D) \( \text{split('\\t')} \)
(E) \( \text{split('\\/t')} \)

15. What should DDD be replaced with?
(A) \( \text{fields[4].split('@')} \)
(B) \( \text{fields[3].split('@')} \)
(C) \( \text{fields.split('@')} \)
(D) \( \text{split('@')} \)
(E) \( \text{fields[5].split('@')} \)

16. What should EEE be replaced with?
(A) \( \text{email[0]} \)
(B) \( \text{email[1]} \)
(C) \( \text{email[2]} \)
(D) \( \text{email} \)

17. What should FFF be replaced with?
(A) if domain not in D:
    D[domain] = 1
else:
    D[domain] = D[domain] + 1
(B) if domain not in D:
    D[domain] = 1
else:
    D[domain] + 1
(C) if domain not in D:
    D[domain] = 1
else:
    D[domain] = 1
(D) if domain not in D:
    D[domain] = D[domain] + 1
else:
    D[domain] = 1

18. What should GGG be replaced with?
(A) \( \text{global SENTINEL} \)
(B) \( \text{SENTINEL = EOF} \)
(C) \( \text{SENTINEL = 'EOF'} \)
(D) Nothing
19. What should HHH be replaced with?
   (A) if line == SENTINEL:
       break
   (B) if line == SENTINEL:
       continue
   (C) if line = SENTINEL:
       break
   (D) if line = SENTINEL:
       continue
   (E) if line == 'EOF':
       break

20. What should III be replaced with?
   (A) readdata()
   (B) readdata
   (C) process()
   (D) process(D)
   (E) readdata()
       process(D)

21. What should JJJ be replaced with?
   (A) print(k, D[k])
   (B) print(D[k], k)
   (C) print(k)
   (D) print(D[k])

22. D is a sequence.
   (A) True
   (B) False

23. k is a sequence.
   (A) True
   (B) False

**Answer Key**

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

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