CPSC 231 Midterm 2

Duration: 40 minutes

15 March 2013

- This exam has 33 questions and 10 pages.
- 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. What should AAA be replaced with, to best complete the function?

   def add2(n):
       AAA
       (A) return n + 2
       (B) return n
       (C) n + 2
       return n

2. How many times is X printed when this code is run? (The code is shown in its entirety.)

   def foo():
       print('X')
       print('X')
       print('X')
       return
       print('X')

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

3. The function f should take a list of coordinates as an argument, where the list of coordinates is expressed as (x,y) coordinate pairs. The function should move the turtle to each of those coordinates in the order given by the list, thus drawing a shape. An example call to this function is

   f([[ (1, 2), (3, 4) ]])

   How would this function best be defined?

   (A) import turtle
       def f(L):
           for coord in L:
               x = coord[0]
               y = coord[1]
               turtle.goto(x, y)

   (B) import turtle
       def f():
           for coord in L:
               x = coord[0]
               y = coord[1]
               turtle.goto(x, y)

   (C) import turtle
       def f(coord1, coord2):
           turtle.goto(coord1, coord2)
(D) import turtle
    def f(L):
        for coord in range(len(L)):
            x = L[coord]
            y = L[coord+1]
            turtle.goto(x, y)

(E) import turtle
    def f(L):
        for coord in range(len(L)):
            x = coord[0]
            y = coord[1]
            turtle.goto(x, y)

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

    for i in range(4):
        print('X')
        continue
        if i > 2:
            print('X')

(A) 1
(B) 4
(C) 5
(D) 6
(E) There is an error when this code is run

5. What input would result in every line of this program being run at least once?

    def A():
        print('X')
    def B(n):
        if n < 2:
            A()
    def C():
        s = input()
        i = int(s)
        while i > 0:
            i = i - 1
            if i > 12:
                B(i)
            break
    C()

(A) 1
(B) 2
(C) 12
(D) 13
(E) None of these inputs will have this effect

6. How many times is X printed when this code is run?
i = 5
while i < 9:
    print('X')

(A) 4
(B) 5
(C) 8
(D) 9
(E) An infinite number of times

7. What is printed when this code is run?

i = -2
j = 0
while j < 3:
    j = j + 1
    i = i + 1
print(i)

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

8. What is printed when this code is run?

i = -2
j = 0
while j < 3:
    j = j + 1
    i = i + j
print(i)

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

9. Consider the following code.

```python
def add(x, y):
    return x + y
```

How many of the following calls would not result in an error?

add(2, 3)
add('2', 3)
add('2', '3')
add([1, 2], [3])
10. What does the following code print when run?

```python
S = [1, 2]
S.append(3)
S.append(S.pop() * S.pop())
S.append(S.pop() + S.pop())
print(S[0])
```

(A) 7  
(B) 6  
(C) 5  
(D) 1  
(E) There is an error when it is run

Part 2

For this section, assume the following code has been run.

```python
L = [5, 4, 3, 2, 1]
T = (-1, -2, -5, -7)
D = {}
for i in range(len(T)):
    k = T[i]
    v = L[i]
    D[k] = v
```

11. What is `L[1]`?  
(A) 3  
(B) 5  
(C) -1  
(D) None of these values

12. What is `len(D)`?  
(A) 3  
(B) 4  
(C) 5  
(D) 8  
(E) 10

13. How many of the following statements evaluate to True?

4 in D  
L[-2] == len(T)  
D[-1] == 5
14. How many of the following statements evaluate to False?

\[ T[-2] == -L[0] \]
\[ len(L[2:4]) != 3 \]

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

15. The code

```python
for k in D:
    print(k)
```

will always print -1 first.

(A) True  
(B) False  

16. How many of the following statements would cause an error?

L.append('abc')  
T.append(12)  
D[-5] = 7  
L[6] = 7

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

**Part 3**

For this section, assume the following code has been run.

```python
s = 'abxxab'
```


(A) Yes  
(B) No
18. Is $s[2:] == s[-2:]$?
   
   (A) Yes
   (B) No

19. What is $s[1:4]$?
   
   (A) 'bxx'
   (B) 'bxxa'
   (C) 'abx'
   (D) 'abxx'

**Part 4**

The function $f$ takes a list of compass directions, and returns True if a person moving in those directions, in that order, would end up in the same spot they started in. Assume the same distance is traveled in each direction. (Note: if you are facing north, then east is to your right.) For example,

- $f([\text{"w"}, \text{"e"}])$ returns True;
- $f([\text{"w"}])$ returns False;
- $f([\text{"n"}, \text{"e"}, \text{"s"}, \text{"w"}])$ returns True;
- $f([\text{"n"}, \text{"e"}, \text{"s"}, \text{"w"}, \text{"w"}])$ returns False.

Starting with the following:

```python
def AAA:
    BBB
    for d in dirs:
        if d == 'n':
            y = y + 1
        elif d == 's':
            CCC
        elif d == 'e':
            DDD
        else:
            x = x - 1
        if EEE:
            return True
    return False
```

20. What should $AAA$ be replaced with?

   (A) $f(dirs)$
   (B) $f(dir)$
   (C) $f(d)$
   (D) $f()$
   (E) $f(x, y)$

21. What should $BBB$ be replaced with?

   (A) $x = 0$
   $y = 0$
   (B) $x = 1$
   $y = 1$
(C)  \(x = 0\)  
    \(y = 1\)  
(D)  \(x = 1\)  
    \(y = 0\)

22. What should CCC be replaced with?
   (A)  \(y = y - 1\)  
   (B)  \(y = y + 1\)  
   (C)  \(x = x - 1\)  
   (D)  \(x = x + 1\)

23. What should DDD be replaced with?
   (A)  \(y = y - 1\)  
   (B)  \(y = y + 1\)  
   (C)  \(x = x - 1\)  
   (D)  \(x = x + 1\)

24. What should EEE be replaced with?
   (A)  \(x == 0\)  
   (B)  \(y == 0\)  
   (C)  \(x == y\)  
   (D)  \(x == 0 \text{ and } y == 0\)  
   (E)  \(x == 0 \text{ or } y == 0\)

25. What is the result of 
   \(f(['e', 'e', 'x', 'w'])\)
   
   (A) True  
   (B) False  
   (C) There is an error when it is run

Part 5

The following program reads input in “CSV” format, i.e., “comma-separated value” format, where fields are separated by a comma; each line contains information about a different person. The sentinel EOF appears at the end. For example:

John,Doe,123 Main Street,Calgary  
Sue,Do,#149 Xkcd Lane,Interwebs  
Bob,Loblaw,2500 University Drive NW,Moose Jaw  
Jane,Doe,123 Main Street,Calgary  
EOF

Assuming the program is in the file city.py and the input is in the file datafile, the program is run as follows:

```
python3 city.py < datafile
```

The program will print out, for each city, the first names of people located there. For the file above, the output might be
Starting with the following:

```
D = AAA
SENTINEL = 'EOF'
```

```
while True:
    line = input()
    if line == SENTINEL:
        BBB
    fields = CCC
    city = DDD
    name = EEE
    if FFF:
        D[city] = [name]
    else:
        D[city].append(name)
for GGG:
    print(city)
for HHH:
    print('	', name)
```

26. What should AAA be replaced with?

   (A) { }
   (B) [ ]
   (C) ( )
   (D) None

27. What should BBB be replaced with?

   (A) continue
   (B) break
   (C) exit()
   (D) import sys
       sys.exit()

28. What should CCC be replaced with?

   (A) line.split(',' , )
   (B) line.split( ' ')
   (C) line.split( '\t')
   (D) line.split()
   (E) line.split('/t')

29. What should DDD be replaced with?

   (A) fields[3]
30. What should EEE be replaced with?
   (A) fields[3]
   (B) fields[4]
   (C) fields[0]
   (D) fields[1]
   (E) fields[2]

31. What should FFF be replaced with?
   (A) city not in D
   (B) city in D
   (C) D[city]
   (D) city == D[city]

32. What should GGG be replaced with?
   (A) city not in D
   (B) city in D
   (C) city in range(len(D))
   (D) name in D
   (E) name in range(len(D))

33. What should HHH be replaced with?
   (A) name in D[city]
   (B) name in D
   (C) name in city
   (D) city in D
   (E) name in range(len(D[city]))

**Answer Key**

Q1: A; Q2: A; Q3: A; Q4: B; Q5: E; Q6: E; Q7: A; Q8: C; Q9: D; Q10: A; Q11: D; Q12: B; Q13: B; Q14: C; Q15: B; Q16: C; Q17: A; Q18: A; Q19: A; Q20: A; Q21: A; Q22: A; Q23: D; Q24: D; Q25: A; Q26: A; Q27: B; Q28: A; Q29: A; Q30: C; Q31: A; Q32: B; Q33: A.

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