

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.

```
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])
```

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

10. What does the following code print when run?

```
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.

```
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)
T[2] == 2
D[-1] == 5
```

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

14. How many of the following statements evaluate to False?

```
L[3] - L[2] == L[1]  
L[1] - L[3] == L[4]  
T[-2] == -L[0]  
len(L[2:4]) != 3
```

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

15. The code

```
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.

```
s = 'abxxab'
```

17. Is `s[2] == s[-3]`?

- (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(['w', 'e'])` returns `True`;

`f(['w'])` returns `False`;

`f(['n', 'e', 's', 'w'])` returns `True`;

`f(['n', 'e', 's', 'w', 'w'])` returns `False`.

Starting with the following:

```
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 and y == 0`
- (E) `x == 0 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

Interwebs
 Sue
Calgary
 John
 Jane
Moose Jaw
 Bob

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('\t', 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]

- (B) `fields[4]`
 - (C) `fields[0]`
 - (D) `fields[1]`
 - (E) `fields[2]`
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.