CPSC 231 Midterm 2

Duration: 40 minutes

14 March 2014

- This exam has 27 questions and 9 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. What does this code print when it is run?

```
x = 42
def foo():
    global x
    x = 123
print(x)
foo()
print(x)
```

(A) `42`, then `123`

(B) `42`, then `42`

(C) `123`, then `42`

(D) `123`, then `123`

(E) There is an error when this code is run

2. What does this code print when it is run?

```
def one(n):
    return n + 2
def three(n):
    return n - 4
print(one(3) + three(6))
```

(A) `7`

(B) `3`

(C) `6`

(D) `2`

(E) `4`

3. What does this code print when it is run?

```
x = [1, 2, 3]
y = x
x[-3] = 2
print(y[0] + y[1])
```

(A) `4`

(B) `1`

(C) `2`

(D) `3`

(E) There is an error when this code is run

4. What does this code print when it is run?

```
def de(f):
    print(f)
    banana = int(f)
    return f
    print(f)
    f
f = 12.3
print(de(f))
```

(A) `12.3`, then `12.3`

(B) `12.3`, `12.3`, and `12`, in that order

(C) `12.3`, then `12`

(D) `12.3`, `12`, and `12`, in that order

(E) `12.3`, `12`, and `12.3`, in that order

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

```
N = 42
def foo():
    for i in range(N):
        print('X')
```

(A) `0`

(B) `41`

(C) `42`

(D) `43`

(E) Some other number not listed here

6. What does this code print when it is run?

```
def foo():
    x = 34
    print(x)
def bar(x):
    foo()
    print(x)
x = 12
bar(x + 2)
```

(A) `34`, then `14`

(B) `34`, then `34`

(C) `34`, then `12`

(D) `12`, then `14`

(E) `12`, then `12`

7. What does this code print when it is run?

```
x = 'hi'
def foo(x):
    print(x)
foo(1)
foo(x)
```

(A) `1`, then `hi`

(B) `hi`, then `hi`

(C) `hi`, then `1`

(D) `hi`, `1`, and `hi` in that order

(E) There is an error when this code is run

Part 2

Use the following code for the questions in this section.

```
r = 0
pc = 0
m = input()
while pc < len(m):
    if m[pc] == 'A':
        r = r + int(m[pc + 1])
        pc = pc + 2
    elif m[pc] == 'B':
        if r < int(m[pc + 1]):
            pc = 0
        else:
            pc = pc + 2
print(r)
```

8. What is the output when the code is run with the input `A8`?

   (A) `8`
   (B) `0`
   (C) `2`
   (D) `1`
   (E) `10`

9. What is the output when the code is run with the input `A1A7`?

   (A) `8`
   (B) `0`
   (C) `4`
   (D) `1`
   (E) `7`

10. What is the output when the code is run with the input `A1B7A9`?

    (A) `16`
    (B) `0`
    (C) `7`
    (D) `9`
    (E) There is an infinite loop

Part 3

Use the code below to answer the questions in this section. The code is located in files named `m1.py` and `m2.py`, as noted.

```
# m1.py
import m2
import m2
print('W')
if __name__ == '__main__':
    print('X')
```

```
# m2.py
print('Y')
if __name__ == '__main__':
    print('Z')
```

11. What is output when the code is run using `python3 m1.py`?

    (A) `Y`, `Y`, `Z`, `W`, and `X`, in that order

    (B) `Y`, `W`, and `X`, in that order

    (C) `Y`, `Z`, and `W`, in that order

    (D) `Y`, `Z`, `W`, and `X`, in that order

    (E) `Y`, `Y`, `W`, and `X`, in that order

12. What is output when the code is run using `python3 m2.py`?

    (A) `Y`

    (B) `Y` and `Z`, in that order

    (C) Nothing

    (D) There is an error when this code is run

Part 4

Use the following definition and the labeled code snippets below to answer the questions in this section.

```
M = [
    [1, 2, 3],
    [4, 5, 6],
    [7, 8, 9]
]
```

```
# code "Alice"
sum = 0
for r in M:
    sum = sum + r[0]
print(sum)
```

```
# code "Bob"
sum = 0
for v in M[1]:
    sum = sum + v
print(sum)
```

```
# code "Carol"
sum = 0
for r in M:
    sum = sum + r[-1]
print(sum)
```

```
# code "David"
sum = 0
for i in range(len(M)):
    sum = sum + M[2 - i][i]
print(sum)
```

```
# code "Eve"
sum = 0
for i in range(len(M)):
    sum = sum + M[i][i]
print(sum)
```

13. Which code snippet calculates and prints the sum of the values in the leftmost column of `M`?

    (A) `code "Alice"`

    (B) `code "Bob"`

    (C) `code "Carol"`

    (D) `code "David"`

    (E) `code "Eve"`

14. Which code snippet calculates and prints the sum of the values in the rightmost column of `M`?

    (A) `code "Alice"`

    (B) `code "Bob"`

    (C) `code "Carol"`

    (D) `code "David"`

    (E) `code "Eve"`

15. Which code snippet calculates and prints the sum of the values in the middle row of `M`?

    (A) `code "Alice"`

    (B) `code "Bob"`

    (C) `code "Carol"`

    (D) `code "David"`

    (E) `code "Eve"`

16. Which code snippet calculates and prints the sum of the values in the diagonal of `M`, from the lower left to the upper right corner?

    (A) `code "Alice"`

    (B) `code "Bob"`

    (C) `code "Carol"`

    (D) `code "David"`

    (E) `code "Eve"`

Part 5

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

```
D = { 2: 4, 6: 8, 4: 6, 8: 8 }
L = [1, 3, 5, 7, 9]
T = (1, 3, 5, 7, 9)
DD = { 'foo': { 0: 1, 1: 2 }, 'bar': { 1: 1, 2: 1 } }
```

17. `L[2:4]` is

    (A) `[5, 7]`

    (B) `[3, 5, 7]`

    (C) `[3, 5]`

    (D) `[5, 7, 9]`

18. How many of the following statements result in errors?

    ```
    L[2] = T
    T[2] = 3
    print(D[6])
    print(DD['foo'][2])
    ```

    (A) 0

    (B) 1

    (C) 2

    (D) 3

    (E) 4

19. What does the following code print when it is run?

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

    (A) `2`, `4`, `6`, `8`, in that order

(B) 2, 6, 4, 8, in that order

(C) 2, 8, 6, 4, in some order

(D) 4, 8, 6, 8, in some order

(E) 4, 6, 8, 8, in that order

20. What does the following code print when it is run?

```
sum = 0
for k1 in DD:
    for k2 in DD[k1]:
        sum = sum + DD[k1][k2]
print(sum)
```

(A) 5

(B) 4

(C) 9

(D) There is an error when this code is run

21. How many of the following statements evaluate to `True`?

```
L[-1] == L[1] * L[1]
len(T[:3]) == 2
D[8] - D[2] > D[4]
len(D) != len(T) - 1
```

(A) 0

(B) 1

(C) 2

(D) 3

(E) 4

Part 6

A simple *preprocessor* is a program that reads a text file, looking for lines of the form

```
#define foo bar
```

and will thereafter replace all occurrences of `foo` in the text with `bar`. For example, given the file (with sentinel `EOF`)

```
#define foo bar
I will go to the foo and
do chin-ups on the foo
EOF
```

the resulting output will be

```
I will go to the bar and
do chin-ups on the bar
```

Starting with the following:

```
D = {}
while True:
    line = input()
    if line == 'EOF':
        break
    AAA
    if len(words) == 3 and BBB == '#define':
        CCC = DDD
    else:
        for word in words:
            if word not in EEE:
                print(word, end=' ')
            else:
                print(FFF, end=' ')
        print()
```

22. What should `AAA` be replaced with?

    (A) `words = line.split()`

    (B) `words = split(line)`

    (C) `words = list(line)`

    (D) `line.split()`

    (E) `split(line)`

23. What should `BBB` be replaced with?

    (A) `words[0]`

    (B) `line[0]`

    (C) `words[0][0]`

    (D) `words[1]`

    (E) `words[1][0]`

24. What should `CCC` be replaced with?

    (A) `D[words[1]]`

    (B) `D[words[0]]`

    (C) `D[words[2]]`

    (D) `words[0]`

    (E) `words[1]`

25. What should `DDD` be replaced with?

    (A) `words[2]`

    (B) `words[0]`

    (C) `words[1]`

    (D) `words[3]`

26. What should `EEE` be replaced with?

    (A) `D`

    (B) `D[0]`

    (C) `D[word]`

(D) `D[word][0]`

27. What should `FFF` be replaced with?

    (A) `D[word]`

    (B) `word`

    (C) `D[0]`

    (D) `D[word][0]`

    (E) `D[word][1]`

Answer Key

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

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