

Written Midterm Exam

This exam is closed book - you are allowed only one page of notes (double-sided). If a question seems unclear - please write down any assumptions you feel are needed. If you think that there is a just-plain mistake/typo - check with an instructor.

Anywhere we ask you what will be printed out, if you think an error will be generated, you may write “error”. You do not need to write out what the whole error message would be.

(Note: questions 20-29 are worth half the points on the exam; make sure you leave enough time for them.)

1. (75) Write a statement to print the second to last element from any list L (assuming it has at least two items). When L is defined as follows, it would print just the letter l.

```
L = ['h', 'e', 'l', 'l', 'o']
```

`print L[-2]`

2. (75) After the following Python code is executed, what will be the type of n[:3]?

```
n = "12345"
```

- a. Integer
- b. Float
- c. String
- d. List
- e. Tuple
- f. None of the above; there will be an error

A string

3. (75) After the following Python code is executed, what will be the type of L[2:3]?

```
L = ['h', 'e', 'l', 'l', 'o']
```

- a. Integer
- b. Float
- c. String
- d. List
- e. Tuple
- f. None of the above; there will be an error

A list

4. (75) What will the following code print out?

```
myvar = "hello"  
print myvar[0]
```

'h' will print out

5. (75) What will the following code print out?

```
myvar = "hello"  
print "myvar"[0]
```

'm' will print out

6. (75) After the following Python code is executed, what will be the type of the variable x?

```
x = int(12.0) / float(5)
```

- a. Integer
- b. Float
- c. String
- d. List
- e. None of the above; there will be an error

Float

7. (75) What will print out?

```
x = 3  
print x == x + 1
```

- a. 3
- b. 4
- c. True
- d. False
- e. None of the above; there will be an error

False

8. (75) After the following Python code is executed, what will be the type of the variable t?

```
s = "<published>2009-01-23T20:04:53Z</published>"  
t = s.split()
```

- a. Integer
- b. Float
- c. String
- d. List
- e. None of the above; there will be an error

A list

Just makes a list
but same words cuz no spaces

9. (75) After the following Python code is executed, what will be the type of the variable t?

```
s = "<published>2009-01-23T20:04:53Z</published>"  
t = s.find("2009")
```

- a. Integer
- b. Float
- c. String
- d. List
- e. None of the above; there will be an error

Integer

10. (100) What will the following code print out?

```
s = "<published>2009-01-23T20:04:53Z</published>"  
print s.split('-')[1]
```

It will print out [<published>2009-01, 23T20:04:53z</published>]

-100

11. (150) What will the following code print out?

```
s = "<published>2009-01-23T20:04:53Z</published>"  
print len(s.split('T')[0].split('2'))
```

This will print out 10

-150

12. (150) Consider two files, each containing the complete lyrics for one song. The first song has three verses, with a single chorus repeated after each verse. The second song has six verses, all different from each other. Both files have exactly the same number of characters in them. Which file has more information in it, the one with the chorus or the one with no chorus?

The one without a chorus has more information in it

Because it is more repetive or has more information

13. (150) Consider two coins. One is a “fair” coin, which lands on heads half the time and tails half the time. The other is a “biased” coin which lands on heads three quarters of the time. Which provides more information, the outcome of the toss of the fair coin or the biased coin? Or do they each provide the same amount of information? Briefly justify your answer in 1-2 sentences.

The biased coin provides more information. We can see a trend from this coin, whereas the regular coin since it has 50/50 shot of either outcome and will simply give us answers based on random chance. The biased coin will show information on how likely we are to get heads with a 75% chance and thus not a random chance.

-150.

Higher information entropy
It is less predictable!!!

14. (150) You are currently connected to the directory
~/Documents/Courses/106/F14/Exams. Write one or more unix
commands that will display the contents of ~/Documents/Courses/106

cd ~/Documents/Courses/106
ls

For the next three questions, assume that the following code has already executed.

```
L = ["First", "Second", "Third"]
```

15. (100) What would the following Python code print out?

```
for x in L:
    y = L[0]
    print y
```

First
First
First

16. (100) What would the following Python code print out?

```
for x in L:
    y = L[0]
    print y
```

First

17. (100) What would the following Python code print out?

```
for x in L:
    y = x in L
    print y
```

-100
prints:
True
True
True

True

18. (150) What will the following code print out?

```
x = 10.5
if x < 10:
    print "one"
elif x < 20:
    if x > 15:
        print "two" 'Three'
    else:
        print "three"
elif x > 0:
    print "four"
```

19. (150) What will the following code print out?

```
x = 10.5
if x < 10:
    print "one"
elif x < 20:
    if x > 15:
        print "two" 'Three', 'four'
    else:
        print "three"
if x > 0:
    print "four"
```


20. (150) What would this code print out?

```
L = []  
L.append('a')  
L.append('b')  
L.append('c')  
L[1]=0  
print L
```

-100

Read the positioning!

[0, 'b', 'c']

21. (150) What would this code print out?

```
d = {}  
d[1] = 'a'  
d[2] = 'b'  
d['c'] = 3  
d['c'] = d['c'] + 1  
print d['c']
```

This would print out 4

22. (150) What would this code print out?

```
d = {}  
d[1] = 'a'  
d[2] = 'b'  
d['c'] = 3  
print 'a' in d.values()
```

True

23. (150) Write one line of code that accomplishes what the last three lines of code below do.

```
t = (20, 30, 40)
x = t[0]
y = t[1]
z = t[2]
```

`t = (x, y, z)`

`t = {20: x, 30: y, 40: z}`

`-100`

24. (150) What value prints?

```
def g(x, y):
    z = y + x
    return y
y = 10
z = g(5, y)
print z
```

`10`

- a. 5
- b. 10
- c. 15
- d. None
- e. There will be an error

25. (150) What will the following code print out?

```
x = -1
y = -2
z = -3
def h(x, y = 2, z = 3):
    print x, y, z
```

`h(1)`

`This will print: 1, 2, 3`

The next two questions assume the following code has been executed.

```
L = [{ 'a':1, 'b':2, 'd':11 },
      { 'a':4, 'b':5, 'e':11 },
      { 'a':7, 'b':8, 'f':11 }
    ]
```

26. (225) Write code to print each of the values associated with the key 'b' in each of the dictionaries in L. In other words, it should print:

2
5
8

```
For e in L:
    For x in e:
        print x[1]
```

-150

```
For e in L:
    print e['b']
```

27. (300) Write code that generates a single dictionary with one key for each of the keys in any of the dictionaries in L, and value equal to the count of how many dictionaries the key appears in. That is, the dictionary it generates should be:

```
{ 'a': 3, 'b': 3, 'd': 1, 'e': 1, 'f':1}
```

```
d = {}
for a in L:
    if a not in d:
        d[a] = 1
    else:
        d[a] += 1
print d
```

-200

```
d = {}
dkeys = L.keys()
for a in dkeys:
    if a not in dkeys:
        d[a] = 1
    else:
        d[a] += 1
print d
```

28. (300) Write code that repeatedly asks the user to input numbers. Keep going until the sum of the numbers is 21 or more. Print out the total.

```
a = 0
while a <= 21:
    x = int(raw_input('Give me a number'))
    a = x + a
```

Don't forget print!

```
def deduplicate(x):
    b = [ ]
    for a in x:
        if a not in b:
            b.append(a)
    return b
```

29. (300) Define a function called deduplicate. It takes a list as input and returns a list that has all duplicates removed, keeping only the first instance of each item. For example, if passed the input [1, 2, 3, 2, 4, 2, 3, 4, 5], it would return [1, 2, 3, 4, 5].

```
def deduplicate(x):  
    b = [ ]  
    for a in x:  
        if a not in b:  
            b = b + a  
    return b
```

*append to a list
add to a string or integer!!!!*

-150

```
def deduplicate(lst):  
    acc_lst = []  
    for x in lst:  
        if x not in acc_lst:  
            acc_lst.append(x)  
    return acc_lst
```