Comp 150 Exam 2 Overview.

Resources During the Exam

The exam will be closed book, no calculators or computers. You may bring notes on two sides of 8.5x11 inch paper (either both sides of one sheet, or two sheets written on single sides). Write this as you study! I mostly want to test you on concepts, not memorized rote facts.

Main topics that may be on exam 2: Zelle: Ch. 4, 5, 7.1-7.3, 8.1-8.4.2 (can't avoid some of ch. 2, 3)

1. Control flow: sequential, decision if-elif-else, loop through sequence, while
2. Sequence operations including append.
3. You are still likely to need basic string operations capitalize, find, join, lower, replace, split, upper
4. Converting types between int and string.
5. Files – Input: opening, read (all), as a sequence of lines; Output: open, write, close
6. Interactive loops, sentinel loops, simple nested loops.
7. graphics: object notation for method calls, methods for GraphWin and graphics objects, text, entries, mouse clicks.
8. Boolean values, write expressions with comparisons and read expressions with operations 'and', 'or', 'not', using the Boolean result.

How the Python topics get used:

1. Follow fairly arbitrary code using the elements above, and show the results. Distinguish exactly what is the output from the sequence of internal steps.
2. Write a few lines of code translating ideas into Python; put several steps together.

Read the following before looking at either the problems or the solutions! (Points 1 and 2 are the same as from Exam 1)

1. Study first and then look at the sample problems. The sample problems cannot give complete coverage, and if you look at them first, you are likely to study just these points first, and will not get an idea how well you are prepared in general. Look at the list at the top of the page and start by filling in any holes.
2. Do not look at the answers until you have fully studied and tried the problems and gotten *help* getting over rough spots in the problems if you need it! Looking at the answers before this time makes the problems be just a few more displayed examples, rather than an opportunity to actively learn by doing and check out where you are. The *doing* is likely to help you be able to *do* again on a test.

Zelle problems most like the exam (with solutions already on the web):
p 159: 3; p 227: 2; p 228: 4 ; p. 261: 2,3

New sample problems start on the next page.

Further Review Problems for Exam 2 (Solutions follow the problems.)

1. Suppose the file 'prob1.txt' contains the three lines
   Hello
   there
   Mom

   a. What is printed by
```
fin = open(prob1.txt, 'r')
s = fin.read()
print s[1]
```

   b. What is printed by
```
fin = open(prob1.txt, 'r')
s = fin.readLines()
print s[1]
```

   c. What is printed by
```
fin = open(prob1.txt, 'r')
for s  in fin:
    print s[1],
```

2. W hat will be the contents of the file prob2.txt? Indicate any blanks or newlines clearly.
```
fout = file('prob2.txt', 'w')
    words = ['Hello', 'there', 'Mom']
    for w in words:
         fout.write(w)
    fout.close()
```

3. If the lines below are run repeatedly with thr numbers shown as the inputs, what will be printed?
```
x = input("number: ")
if x < 3:           #1
    print "A",      #2
elif x > 10:        #3
    print "B",      #4
else:
    print "C",      #5
```

   a. 5 b. 12 c. -2 d. 10

4. If the lines below are run multiple times with the different sets of input shown, what will be printed?
```
x,y  = input("two comma separated numbers: ")
if x == y:                #1
    print "A",            #2
elif x  < 5 and y > 2:    #3
    print "B",            #4
if x > 2 or y > 4:        #5
    print "C",            #6
```

   a. 5, 3 b. 5, 5 c. 1, 5 d. 1, 1

5. What is printed?

```
x = 1                    #1
while  x < 5:            #2
    print x,             #3
    x = x + 2            #4
```

6. What is printed?

```
for x in [30, 40]:       #1
  for y in [1, 2, 3]:    #2
    print x+y,           #3
..print                  #4
```

7. What is printed?

```
for n in [1, 3]:          #1
  for s in ['a', 'b']:    #2
    print s*n,            #3
```

8. Write a Python program that prints out the first word of each line of the file 'prob8.txt". Here 'word' means sequence of characters without white space. You may assume there is at least one word on each line of the file. Print one word to a line.

9. Modify the previous problem to put the words in a list which you call **all** (and do not print anything).

10. Modify the previous answer to allow lines with no words. In that case add an empty String to the list.

11. Write code that inputs a number from the user and prints "High" if it is over 100, "Low" if it is less than 50, and "In between" otherwise.
12. Assuming you have a GraphWin called win, write the code to draw a circle of radius 10 and center (40, 50).

Answers on the next page

Exam 1 Review Problem Answers

1a. e — index 1 mean 2nd in seq. Here the file is one seq of letters
b. there — index 1 from seq of lines
c. e h o — s is a different line each time, print char at index 1 each time

2. HellothereMom (no spaces or new lines)

3a . C first two tests are false 5<3, 5>10, falls through to else
b. B first true part is 12 > 10. Never get to else
c. A stop at first test -2 < 3
d. C both tests false as in part a.

step by step – does not show the spaces and newlines, not a complete substitute for the final answer!

line	comment	line	comment	line	comment	line	comment
1	5 <3 false	1	12 <3 false	1	-2 <3 true	1	10 <3 false
3	5 > 10 false	3	12 > 10 true	2	print A	3	10 > 10 false
5	print C	4	print B			5	print C

4a. C b. A C c. B C d. A
Note the last if statement is completely separate from the part above, so the last test is always done. The middle test is only true if both comparisons are true. The last test is true if either comparison is true.

step by step – does not show the spaces and newlines, not a complete substitute for the final answer!

line	comment
	part a
1	5 == 3 false
3	5 <5 and 3>2: false and true: false
5	5>2 or 3>4: true or false: true
6	print C
	part b
1	5 == 5 true
2	print A
5	5>2 or 5>4: true or true: true
6	print C

line	comment
	part c
1	1 == 5 false
3	1 <5 and 5>2: true and true: true
4	print B
5	1>2 or 5>4: false or true: true
6	print C
	part d
1	1 == 1 true
2	print A
5	1>2 or 1>4: false or false: false

5. 1 3 x is printed before being increased, so the first value is printed. The last value of x is 5, but x becomes that after the last time it is printed.

step by step – does not show the spaces and newlines, not a complete substitute for the final answer!

line	x	comment
1	1	
2		1<5 true: loop
3		print 1
4	3	
2		3<5 true: loop
3		print 3
4	5	
2		5<5 false: skip loop

6.
```
31 32 33
41 42 43
```

step by step – does not show the spaces and newlines, not a complete substitute for the final answer!

line	x	y	comment
1	30		first in list
2		1	first in list
3			30+1 = 31; print 31 (stay on line)
2		2	next in list
3			30+2 = 32; print 32 (stay on line)
2		3	last in list
3			30+3 = 33; print 33 (stay on line)
2		-	no more in list - done with inner loop
4			print (advance to new line)
1	40		next in list
2		1	start again with first element
3			40+1 = 41; print 41 (stay on line)
2		2	next in list
3			40+2 = 42; print 42 (stay on line)
2		3	last in list
3			40+3 = 43; print 43 (stay on line)
2		-	no more in list - done with inner loop
4			print (advance to new line)
1	-		done with outer loop

7.
```
a b aaa bbb
```

step by step – does not show the spaces and newlines, not a complete substitute for the final answer!

line	n	s	comment
1	1		first in list
2		a	first in list
3			print a (stay on line)
2		c	second in list
3			print c (stay on line)
2	.....	-..	no more in list - end inner loop
1	3		second in list
2		a	start again - first in list
3			print aaa (stay on line)
2		c	second in list
3			print ccc (stay on line)
2	.....	-..	no more in list - end inner loop
1			no more in list -- done with outer loop

8.
```
fin = open('prob8.txt', 'r')
for line in fin:
    words = line.split()
    print words[0]
```

9.
```
fin = open('prob7.txt', 'r')
all = []
for line in fin:
    words = line.split()
    all.add(words[0])
```

10.
```
fin = open('prob7.txt', 'r')
all = []
for line in fin:
    words = line.split()
    if len(words) > 0:  #or:  if words:
        word = words[0]
    else:
        word = ""
    all.add(word)
```

11.
```
x = input("Enter a number: ")
if x > 10:
    print "High"
elif x < 5:
    print "Low"
else:
    print "In between"
```

12.
```
c = Circle(Point(40, 50), 10)
c.draw(win)
```