CS 105
Introduction to Computer Programming in Python
Midterm Exam Review

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Schedule

- No new lab assigned this week.
- Lecture Class Tuesday, Sept 29:
  Last questions on Tic-Tac-Toe lab
  Review for Midterm Exam
- Lecture Class Thursday, Oct 1: Review for Midterm Exam
- Lab Class (Oct 1 & 2): Review for Midterm Exam
- Midterm Exam: Lecture Class Tuesday, Oct 6
- Fall Break: Oct 8 & 9
Exam Format

- Short answer.
- Write on test
- May bring one page handwritten notes (back and front).
- May bring English/other language dictionary (made of paper) NO electronic dictionary
- No calculators, no computers, no phones
- May bring scrap paper. If you use scrap paper, you may or may not turn it in.

Quiz: range

In Python 3.4, which statement will produce the sequence:

\[ 4, 7, 10, 13, 16, 19, 22, 25 \]

a) >>> range(4, 25, 3)

b) >>> range(4, 28, 3)

c) >>> range(4, 16, 25)

d) >>> range(4, 3, 25)

e) >>> range(4, 7, 26)
Quiz: range

In Python 3.4, which statement will produce the sequence:

\[1, 6, 11, 16, 21, 26\]

a) >>> `range(1,26,5)`
b) >>> `range(1,5,26)`
c) >>> `range(1,5,27)`
d) >>> `range(1,6,11,...)`
e) >>> `range(1,30,5)`

Quiz: What Path does tess Walk?

```python
import turtle
turtle.setup(500,500)
tess = turtle.Turtle()
for a in range(25, 301, 25):
    tess.forward(a)
    tess.right(100)
```

![Tess's path images](a) (a) (b) (c) (d)
Quiz: if Logic

Which if statement can NEVER be true?

a) \textit{if} (a>80) \textit{and} (b>80) \textit{and} (a+b>150):

b) \textit{if} (a>80) \textit{and} (a<150) \textit{and} (b>150):

c) \textit{if} (a>150) \textit{and} (a<80) \textit{and} (b>80):

d) \textit{if} (a>80) \textit{and} (b>80) \textit{and} (a<170) \textit{and} (b<170):

e) \textit{if} (a>100) \textit{and} (b>100) \textit{and} (a<200) \textit{and} (b<200):

Quiz: What is the output?

\begin{verbatim}
for wingardiumLeviosa in range(10,20,3):
    print(wingardiumLeviosa)
\end{verbatim}

\begin{tabular}{|l|l|l|l|l|}
\hline
(a) & (b) & (c) & (d) & (e) \\
\hline
10 & 10 & 10 & 10 & 10 \\
13 & 20 & 20 & 10 & 20 \\
16 & 3  & 10 & 10 & 30 \\
19 & 20 & 20 & 40 & \\
    & 10 & 20 & 50 & \\
    & 20 & 20 & 60 & \\
\hline
\end{tabular}
What is the output?

```python
for a in range(1,6):
    print('==============>',a)
    for b in range(10, 16, a):
        print(b)
```

Reading a Computer Program

- In order to understand a book, you need to be able to read the words and to understand something a bit mysterious about how words fit together. How do you do that mysterious thing? How do those words become a story for you? How can those symbols get you to feel happy, mad, laugh or learn?

- How reading a computer program different from reading a book?
Logic

Three computer scientists walk into a Keva Juice franchise.

The sever asks "Do all of you want a drink"?

The first says, "I don't know".

The second says, "I don't know".

The third says, "Yes!"

Why does the third know his or her answer is correct?

Quiz: Logic

A programmer's wife gives birth and the doctor immediately hands the newborn to the dad. His wife asks impatiently: "So, is it a boy or a girl"?

Which is most likely to be the correct answer?

a) A boy.

b) A girl.

c) Yes.

d) No.

e) Both.
Quiz: 2D List  (1 of 4)

```python
a = [1, 2, 3, 4, 5]
b = [11, 22]
c = [55, 56, 57]
myList = [a, b, c]
print(myList)
```

What is the Output of the above python program?

a) [1, 2, 3, 4, 5, 11, 22, 55, 56, 57]
b) [[1, 2, 3, 4, 5], [11, 22], [55, 56, 57]]
c) [[a], [b], [c]]
d) a, b, c

e) [a, b, c]

Quiz: 2D List  (2 of 4)

```python
a = [1, 2, 3, 4, 5]
b = [11, 22]
c = [55, 56, 57]
myList = ['a', 'b', 'c']
print(myList)
```

What is the Output of the above python program?

a) [1, 2, 3, 4, 5, 11, 22, 55, 56, 57]
b) [[1, 2, 3, 4, 5], [11, 22], [55, 56, 57]]
c) ['a', 'b', 'c']
d) a, b, c

e) [a, b, c]
Quiz: 2D List (3 of 4)

```
a = [1, 2, 3, 4, 5]
b = [11, 22]
c = [55, 56, 57]
myList = [a, b, c]
print(myList[1][0], myList[1][1], myList[2][0])
```

What is the Output of the above python program?

a) [[1, 2, 3, 4, 5], [11, 22], [55, 56, 57]]
b) [1, 0] [1, 1] [2, 0]
c) [1 0] [1 1] [2 0]
d) 10 11 20

e) 11 22 55

Quiz: 2D List (4 of 4)

```
a = [3, 6, 9, 12, 15]
b = [4, 8, 12, 16]
c = [5, 10, 15, 20, 25]
myList = [a, b, c]
print(myList[0][3], myList[1][3], myList[2][3])
```

What is the Output of the above python 3.4 program?

a) 12 16 20
b) 3 13 23
c) 9 12 15
d) 3 4 5

e) 10 15 20
Quiz: Python: `def`, `for` and `range`

```python
def quiz1(n):
    x = 0
    for i in range(n):
        x = x + i
    print(x)

quiz1(6)
```

The output of the Python code above is:

a) 21  
b) 16  
c) 15  
d) 6  
e) 0

---

Quiz: Python: `def`, `for` and `range`

```python
def quiz2(n):
    x = []
    for i in range(n):
        x = x + [i]
    print(x)

quiz2(5)
```

The output of the Python code above is:

a) [0, 1, 2, 3, 4]  
b) [10]  
c) [0, 1, 2, 3, 4, 5]  
d) [15]  
e) [24]
Quiz: Python: `def`, `if` and `return`

```python
def quiz3(c1, c2):
    if (c1[0] != c2[0]): return "A"
    if (c1[1] != c2[1]): return "B"
    if (c1[2] != c2[2]): return "C"
    return "D"

print(quiz3((100,255,255), (255,100,255)))
```

The output of the Python code above is:

a) A  
b) B  
c) C  
d) D  
e) A B C D

---

Quiz: Python: `def`, `if` and `return`

```python
def quiz4(c1, c2):
    bob = "D"
    if (c1[0] != c2[0]): bob = "A"
    if (c1[1] != c2[1]): bob = "B"
    if (c1[2] != c2[2]): bob = "C"
    return bob

print(quiz4((100,255,255), (255,100,255)))
```

The output of the Python code above is:

a) A  
b) B  
c) C  
d) D  
e) A B C D
**Function Example:**
**Distance between 2 points in 2 Dimensions**

```python
import math
def distance(p1, p2):
diffX = p1[0] - p2[0]

dist = math.sqrt(diffX*diffX + diffY*diffY)

return dist

print(distance((0,0), (0,5)))  # 5.0
print(distance((0,5), (0,0)))  # 5.0
print(distance((0,0), (3,4)))  # 5.0
print(distance((1,1), (4,5)))  # 5.0
print(distance((0,0), (2,2)))  # 2.82842712475
```