CS21 Final exam

Content:

- Cumulative – chapters 1-9
- Focus will be on material in chapters 6-9
- Code questions will focus on files, lists and strings.
- If a precedence chart is needed, it will be provided.

Topics by Chapter

Chapter 2

- Input, Processing and Output
- Terminology
- Displaying with print
- Auto new line (how do you change this?)
- Auto space between items (how do you change this?)
- Creating variables
- Valid names (rules vs conventions)
- Using input (always a str, how to change?)
- Math operators (+, -, *, /, //, %, **)
- Precedence
- Comments
- fstrings (including formatting)

Chapter 3

Decision Structures and Boolean Logic

- Relational operators (< , <=, == , etc)
- Logical operators (and, or, not) [know precedence]
- Boolean variables
- If statements (if, if-else, if-elif, if-elif –else)
- Nested if statements
- Comparing strings

Chapter 4

Repetition Structures (Loops)

- Terminology
- Condition-controlled loops
- Count-controlled loops
- for loop
- while loop
- range
- Augmented assignment operators
- Sentinels
- Input Validation
- Nested loops

Chapter 5

Functions

- Void functions
- Value-returning functions
    - For both, know how to call them, use them

- Local/global variables
- Arguments/parameters
- Scope
- Modules (random, math)

Chapter 6

Files

- Input files/output files
    - How do you open them? What happens if the file exists? Does not exist?
- Read from a file (read(), readline(), readlines())
- Write to a file (write)
- Close a file
- Use a loop to process a file
    - for line in filename:
    - while line != '':

Exceptions

- Try/Except (ValueError, IOError, ZeroDivisionError)

Chapter 7

List and Tuples

- List is a mutable sequence, index value start at 0
    - Know how to create lists, access lists. Know the list methods
- Repetition operator (*)
- Know how to copy lists

Chapter 8

Strings

- Immutable
    - What are the implications of this?
- Know how to access into them
    - 0 based indexing
    - Slicing
    - -1 gets to end
- Know your methods
    - Testing
    - Searching
    - Manipulating
    - Splitting

Chapter 9

Dictionaries

- Key-value pairs (access by key only, not value)
    - No duplicate keys
- Adding key/value pairs
- Removing key/value pairs
- Iterate over a dictionary

Sets

- Collection of unique elements
- Add elements
- Remove Elements
- Intersection, Union, Difference

A sampling of short answer questions

- This is not meant to be all-inclusive rather an indication of the types of questions you'll see.
- For any of these questions, if you are unsure of your answer, type it in. [Note: You will not have access to IDLE during the actual exam.]

```
try:
    x = int(input('Enter an integer: : '))
    if x > 10:
        print('one')
    else:
        if x < 5:
            print('two')
        else:
            print('three')
    if x == 6:
        print('four')
    elif x == 11:
        print('five')
    else:
        print('six')
except ValueError:
    print('seven')
```

```
a) 11
b) 12
c) 5
d) 6
What input would produce output
'seven'
```

"myfile.txt" contains:
once upon a time
there was a big fish
the fish ate a turtle

```
infile = open('myfile.txt','r')
s = infile.read()  #what is stored in s?

infile = open('myfile.txt','r')
s = infile.readline()  #what is stored in s?

infile = open('myfile.txt','r')
s = infile.readlines()  #what is stored in s?
```

Given
```
list1 = [1, 3, 2, 4, 5, 2, 1, 0]
```

Predict the output of the following:

```
print(list1[2])

print(list1[12])

print(list1[2:4])


num = list1.index(4)
print(num)


list1.insert(2,4)
print(list1)


list1 = [1, 2, 3]
list2 = list1
list1 = [4, 5, 6]
print(list2)
```

Given
```
s = 'hello world'
```

Predict the output of the following:

```
print(s[5])

print(s * 2)

print(s[:6])

print(s[0::2])

print(s.isspace())

print(s.upper())
```

Given

```
s1 = {4, 8, 6, 5}
s2 = {2, 3, 5, 6}
```

Predict the output of the following:

```
print(s1.union(s2))

print(4 in s2)

print(s1.difference(s2))


s1.add(8)
print(s1)
```

Given

```
d={'dogs':2,'horses':1,'rodents':2}
```

Answer the following:

The keys are?

The values are?

The index of the first element is?

What happens if you attempt to retrieve d['cats']?

To add the key, value pair of 'cats',5 to the dictionary?

Coding questions

You will be expected to write functions. You may be given `main( )` and asked to write a function, or given a function and asked to write `main( )`.

To prepare for these, I would go back through your labs and your homework assignments and attempt to write just pieces of the code. Can you write each function, given the description in the assignment writeup? If you had the function, do you know how to use it? You'll have an opportunity to try it out on the sample exam.