

Name : _____
Section TA: _____

- **INTEGRITY:** By taking this exam, you pledge that this is your work and you have neither given nor received inappropriate help during the taking of this exam in compliance with the Academic Honor Code of Georgia Tech. Do NOT sign nor take this exam if you do not agree with the honor code.
- **DEVICES:** If your cell phone, pager, PDA, beeper, iPod, or similar item goes off during the exam, you will lose 10 points on this exam. Turn all such devices off and put them away now. You cannot have them on your desk.
- **ACADEMIC MISCONDUCT:** Academic misconduct will not be tolerated. You are to uphold the honor and integrity bestowed upon you by the Georgia Institute of Technology.
 - Keep your eyes on your own paper.
 - Do your best to prevent anyone else from seeing your work.
 - Do NOT communicate with anyone other than a proctor for ANY reason in ANY language in ANY manner.
 - Do NOT share ANYTHING during the exam. (This includes no sharing of pencils, paper, erasers).
 - Follow directions given by the proctor(s).
 - Stop all writing when told to stop. Failure to stop writing on this exam when told to do so is academic misconduct.
 - Do not use notes, books, calculators, etc during the exam.
- **TIME:** Don't get bogged down by any one question. If you get stuck, move on to the next problem and come back once you have completed all of the other problems. This exam has 5 questions on 11 pages including the title page. Please check to make sure all pages are included. You will have 50 minutes to complete this exam.

I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community. I have also read and understand the requirements outlined above.

Signature: _____

Question	Points	Score
1. Vocabulary	9	
2. Multiple Choice	9	
3. Draw Books	17	
4. Get Users	12	
5. Regular Expressions	8	
Total:	55	

1. (9 points)

For each of the following vocabulary terms, write a concise 1-2 sentence definition. Be brief, and to the point.

- (a) [3 pts] aliases

Solution: Two variables that point to the same data.

- (b) [3 pts] delimiter

Solution: A character that is used to separate (or delimit) separate data items in a string. The default delimiter for comma separated value (CSV) files is the comma.

Looking for: Separation of data items.

- (c) [3 pts] semantic error

Solution: An error (in code) that leads to unexpected behavior. The program functions correctly (does what the code says) but the code does not actually perform the action that the programmer intended.

2. (9 points)

For each of the following multiple choice questions, indicate the most correct answer! **Indicate your selected answer by circling it.**

- (a) [1 pt] The ORDER BY command in SQL orders data ascending (ASC) if no order is specified.

A. True B. False C. Maybe D. I don't know

- (b) [1 pt] All of the following are valid SQL keywords/functions except:

A. UPDATE B. INSERT C. COUNT **D. MEAN** E. SUM

- (c) [1 pt] What will the '_' wildcard character in SQL match?

A. Exactly one character

- B. One or more characters
- C. Any number of characters (including zero)
- D. '_' is not a proper SQL wildcard

- (d) [1 pt] Assume the variable, `curs`, is assigned to a cursor of a database that has successfully been connected to. The variable, `sql`, is a string assigned to a correct select statement that selected one column. What form will the variable, `result`, be in after the following code is ran?

```
curs.execute(sql)
result = curs.fetchone()
```

- A. [(data1,)]
 - B. ((data1,))
 - C. (data1,)
 - D. Either A or B
- (e) [1 pt] An XML element must have either text, attribute(s), or both.
- A. True
 - B. False**
- (f) [1 pt] Which of the following is True?
- A. Every element in an XML tree has an attribute.
 - B. Every element in an XML tree has text.
 - C. Every XML tree has a root with a tag name of "root"
 - D. Every parent element in an XML tree has at least 2 children elements.
 - E. None of the above**
- (g) [1 pt] Which of the following is True?
- A. Python can only parse XML data from a website
 - B. Python can only parse XML data from a file stored on your computer
 - C. Python can parse XML data from a website and/or a file stored on your computer**
 - D. None of the above
- (h) [1 pt] Which of the following statements is false regarding XML?
- A. Attribute names can be repeated within an element.**
 - B. Attribute values have to be in quotes.
 - C. Empty elements can be self closing.
 - D. An XML document can only have one root element.
- (i) [1 pt] What is the type of the variable "var" after the following line of code is executed?
- ```
var=Label(win, text="Hello World.").pack()
```
- A. 'tkinter.Label'
  - B. <class 'tkinter'>
  - C. <class 'tkinter.Label'>
  - D. <class 'NoneType'>**
  - E. None of the above.

3. (17 points)

Examine the following code.

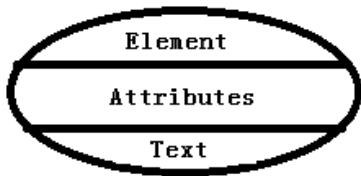
```
import xml.etree.ElementTree as etree

a = etree.Element("Authors")
b = etree.Element("Library")
c = etree.Element("Author")
c.text = "Jane Austen"
d = etree.SubElement(b, "Author")
d.text = "JK Rowling"
e = etree.SubElement(c, "Book")
e.attrib["pub"] = "1813"
e.set("rank", "2")
e.text = "Pride and Prejudice"
f = etree.Element("Book")
f.attrib["title"] = "Harry Potter"
f.text = "Bestseller"
g = etree.SubElement(e, "Character", attrib = {"name": "Mr. Darcy"})
h = etree.Element("Character", attrib = {"name": "Ron Weasley"})
b.append(c)
d.append(f)
tree = etree.ElementTree(b)

root = tree.getroot()
myDict = {}
for item in root:
 for item2 in item:
 myStuff = item2.text
 moreStuff = ""
 for item3 in item2:
 moreStuff = item3.attrib["name"]
 myDict[item.text] = (myStuff, moreStuff)
```

(a) Write the contents of the dictionary:

(b) Draw the XML tree that the code creates using the following format for each element:



**Solution:**

Tree:

```
<Library>
 <Author>JK Rowling
 <Book title="Harry Potter">Bestseller</Book>
 </Author>
 <Author>Jane Austen
 <Book pub="1813" rank="2">Pride and Prejudice
 <Character name="Mr. Darcy" />
 </Book>
 </Author>
</Library>
```

Dictionary:

```
{'Jane Austen': ('Pride and Prejudice', 'Mr. Darcy'),
 'JK Rowling': ('Bestseller', '')}
```

Rubric:

Drawing the XML Tree (13)

- + 3 Uses proper root element (3)
- + 2 For each correct "Author" element (4)
- + 2 For each correct "Book" element (4)
- + 2 For correct character element (2)

For each element, take off -1 if the attribute and/or text is incorrect.

Also take of -1 if they wrote an element that shouldn't exist!

myDict (4)

- + 2 Correct keys
- + 2 Correct tuples

4. (12 points)

A table has been created for you with the following command:

```
CREATE TABLE USER (
 USERNAME VARCHAR(25) NOT NULL,
 PASSWORD VARCHAR(25) NOT NULL,
 PRIMARY KEY (USERNAME));
```

Write a function named `getUsers` that opens a connection to the `academic-mysql.cc.gatech.edu` database using the `"cs2316db"` database and the `"cs2316"` username with `"SECRET"` as the password. Your function should download all of the usernames and passwords from the `USER` table and place them into a dictionary. The username should be the key, and the password should be the value. Return this dictionary. Be sure to close your cursor and database objects when you are done with them!

**Solution:**

```
import pymysql

def getUsers():
 db = pymysql.connect(host = "academic-mysql.cc.gatech.edu", db = "cs2316db",
 user = "cs2316", passwd = "SECRET")
 cur = db.cursor()
 aDict = {}
 cur.execute("SELECT * from USER") #"select USERNAME, PASSWORD from USER"
 for info in cur:
 aDict[info[0]] = info[1]
 cur.close()
 db.close()
 return aDict
```

**Grading:**

- 1 pt - Correct `pymysql` import AND function header definition
- 1 pt - Correct `pymysql.connect` call
- 1 pt - Correct parameters to connect call.
- 1 pt - Created Cursor correctly.
- 1 pt - Correct SQL statement
- 1 pt - Correctly executed SQL statement
- 1 pt - iterates through results correctly.
- 1 pt - Places usernames in dictionary as key

- 1 pt - Places passwords in dictionary as value
- 1 pt - Correctly closes cursor (after getting data out!)
- 1 pt - Correctly closes DB (after using the cursor!)
- 1 pt - Returns the dictionary.



5. (8 points)

For each regular expression given below, determine which of the lines that follow it are completely matched by the regex pattern. (That is, there are no characters in the string that will not be matched by the given pattern...) Circle **all** lines that are fully matched.

(a) [2 pts] Pattern: `\$[0-9]{1,3}(,[0-9]{3})*`

123.456

\$123

\$123456

1,000,000

\$12,456

\$1,000,000.00

**Solution:** \$123

\$12,456

Grading: +2 for 100% correct. Minus 1 for each extra or missing circle, minimum score of zero on this part.

(b) [2 pts] Pattern: `(?:\d\d)*\d`

345

0000

abc

1234567

7778

1

A

**Solution:** 345

1234567

1

Grading: +2 for 100% correct. Minus 1 for each extra or missing circle, minimum score of zero on this part.

(c) [4 pts] Write a regular expression that will match a string formatted as: "City, ST" where city is a single word made up of only letters (uppercase or lowercase), followed by a comma and space, then exactly two upper case letters. You may assume that the city name has at least one letter. For example, the strings:

Marietta, GA

and

Notacity, ST

**Solution:** One possible solution:

$[a-zA-Z]^+$ ,  $[A-Z]\{2\}$

Grading: +1 for matching one or more letters for the city

+1 for matching the comma and space +1 for matching uppercase letters for the ST

+1 for matching exactly 2 letters for the ST.

This page intentionally left blank. You may use it for scratch paper. If you place an answer on this page, box it, indicate which problem it is for by number, and BE SURE TO WRITE "Answer on last page" at the problem location!