Your (printed!) Name: ________________________ CS 1803 Exam 3

Grading TA / Section: ________________________ Monday, Nov. 22th, 2010

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 will not be tolerated. You are to uphold the honor and integrity bestowed upon you by the Georgia Institute of Technology.

1. Keep your eyes on your own paper.
2. Do your best to prevent anyone else from seeing your work.
3. Do NOT communicate with anyone other than a proctor for ANY reason in ANY language in ANY manner.
4. Do NOT share ANYTHING during the exam. (This includes no sharing of pencils, paper, erasers).
5. Follow directions given by the proctor(s).
6. Stop all writing when told to stop. Failure to stop writing on this exam when told to do so is academic misconduct.
7. Do not use notes, books, calculators, etc during the 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.

Signature: ____________________________________

Question	**Possible Points**	**Points Earned**	**Graded By**
True False	12		
SQL Queries	20		
Connect	6		
Objects	20		
Web Scraper	20		
Total	78		

Question 1: Indicate True or False for each statement below 12 Points

1. A compound statement such as a class definition MUST have something in its body. TRUE

2. When writing to an XML file, all attributes must be integers. F- STRINGS

3. In HTML an end tag is indicated by a backslash, ex: </body>. TRUE

4. The following is a valid XML document:
   `<foo></foo>`
   `<bar></bar>` FALSE - It has two root elements

5. ADD, SELECT, and UPDATE are all valid SQL keywords. FALSE

6. To sublcass an existing class, you must provide self and the superclass as parameters ex: class childClass(self, superClass): FALSE - self reference is not required.

7. All object methods must accept a parameter named self as their first parameter. FALSE - The first parameter is named self by convention, but does not need to be.

8. A function is a segment of code that performs a specific operation while a method is a function that is part of an object (and accepts an extra first parameter that references the specific instance). TRUE

Use the following code for questions 9-12

```
class Rondo:
     def __init__(self,assists):
               self.assists = assists
               self.points = 0
               self.vertical = 38
```

9. self.assists and self.points are instance variables. TRUE

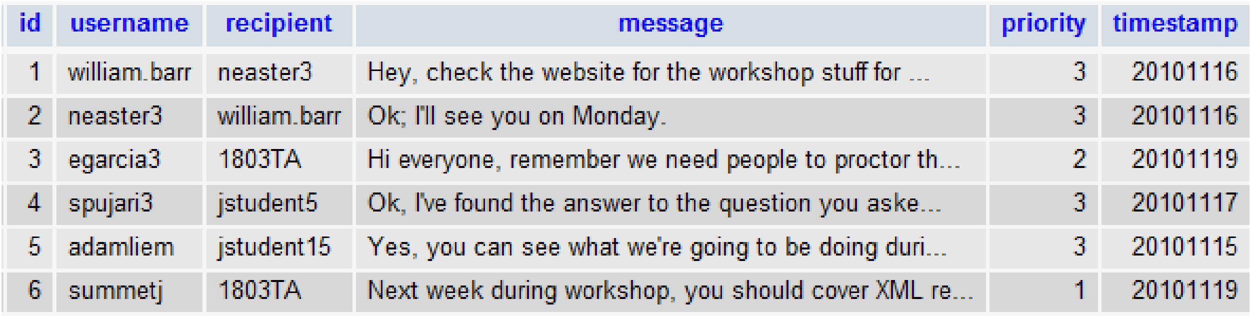
10. Self.assists and self.points can be accessed from other methods. TRUE

11. The __init__() method is called each time an instance of the class Rondo is created. TRUE

12. The following code creates an object of type Rondo with 10 assists:
    `Rondo(10)` TRUE-But it does not save a reference to it.

Question 2: Short-Answer: SQL Query Writing 20 Points

Below is a table, testTable, which represents messages sent between students in a messaging application. The first row is the header which gives the name of each column; every row after that is a sample data row. The id, priority, and timestamp columns are INT columns. (id autoincrements) The username, recipient, and message columns are TEXT columns.



id	username	recipient	message	priority	timestamp
1	william.barr	neaster3	Hey, check the website for the workshop stuff for ...	3	20101116
2	neaster3	william.barr	Ok; I'll see you on Monday.	3	20101116
3	egarcia3	1803TA	Hi everyone, remember we need people to proctor th...	2	20101119
4	spujari3	jstudent5	Ok, I've found the answer to the question you aske...	3	20101117
5	adamliem	jstudent15	Yes, you can see what we're going to be doing duri...	3	20101115
6	summetj	1803TA	Next week during workshop, you should cover XML re...	1	20101119

In the following statements, write the SQL query which will perform the specified action. You should not write any Python code for the following questions.

*Assume that the table is restored to the original (above) after each query that would have actually changed the contents, so each question below should be treated independantly.

1. Return the text of every message that has either been sent or received by william.barr

SELECT message FROM testTable WHERE recipient="william.barr" OR username = "william.barr"
+1 for SELECT message
+1 for FROM testTable
+1 for WHERE recipient="william.barr"
+1 for OR username="william.barr"

2. Return the count of how many messages were sent on 20101116 with a priority of 3.

SELECT COUNT(id) FROM testTable WHERE priority=3 AND timestamp = 20101116
+1 for SELECT COUNT(<any field>)
+1 for FROM testTable
+1 for WHERE priority=3
+1 for AND timestamp = 20101116

3. Return the timestamp and the average of all messages' priority on each day. Order the result by the timestamp in descending order.

SELECT timestamp, AVG(priority) FROM testTable GROUP BY timestamp ORDER BY timestamp DESC
+1 for SELECT timestamp, AVG(priorty)
+1 for GROUP BY timestamp

+1 for ORDER BY timestamp
+1 for DESC

4. Add a row to the table where the username is william.barr, the recipient is 1803TA, there is no message (NULL, not an empty message), the priority is 5, and the timestamp is 20101120.

INSERT INTO testTable (username, recipient, priority, timestamp) VALUES (“william.barr”, “1803TA”, 5, 20101120)
+1 for INSERT INTO testTable
+2 for (username, recipient, priority, timestamp) (in any order, as long as matching values
+1 for VALUES (and the values)

5. Reset every row in the table that has a timestamp of 20101115 to have a priority of 1.

UPDATE testTable SET priority=1 WHERE timestamp = 20101115
+1 for UPDATE testTable
+1 for SET
+1 for priority=1
+1 for WHERE timestamp = 20101115

Code Writing- DB Connect 6 Points

1. Write a function named ***connect*** that takes in a username and password as parameters. Your function should connect to a MySQL database using the appropriate module. (Use "testDatabase.gatech.edu" as the host name and "Test3" as the database name) and then print a message telling the user that the connection is complete. Finally return the database connection object. (6 points)

```
def connect(username, password):                +1
   dat = pymysql.connect( host = “testDatabase.gatech.edu”, passwd = password, user =
                    username, db = “Test3”)              +3
         print(“Connected to the database!”)  +1
   return dat                                   +1
```

points taken off for using "pass" as a variable because it is a keyword in python

Code Writing- Objects 20 Points

Create a class named Student. Each Student will have a name and a major. The default major for each Student will be "UEC". The ***__init__*** method has one parameter, name, which will be a string. This method should assign the value of the instance variable ***name*** to this input parameter.

```
class Student():                         +1

          def __init__(self, name):
                                   +1 for the self parameter
                                   +1 for the name parameter
                 self.name = name        +1
                 self.major = "UEC "             +1
        *could do major = "UEC" in the main class body instead, although that would create a
class variable...
```

Create a class, CsStudent, that extends Student. Each CsStudent should have "CS" as their major and a default grade of 0. The CsStudent's name will be given as an input parameter when the class is instantiated. You **MUST** call the super class __init__() method to assign the name.

There will be two additional methods in the CsStudent class- takeTest and getGrade.

The takeTest method will have no parameters, and when called it will change the CsStudent's grade to a random integer between 0 and 100 (inclusive).

The getGrade method will return the CsStudent's grade.

```
import random                                         +1 for importing random/randrange

class CsStudent(Student):
                                              +1 classCsStudent,  +1 sub-classing Student
    def __init__(self,name):                  +1 self parameter,+1 name parameter
        super().__init__(name)                        +2 calling super to set name.
        self.grade = 0                                +1 for setting grade to zero
        self.major = "CS"                             +1 for setting major to CS

    def takeTest(self):                               +1 for header
        randGrade= random.randint(0,100)              +2 for picking a random number
                                                              or randrange(0,101)
        self.grade = randGrade                        +1  for assigning value to self.grade

    def getGrade(self):                               +1 for correct header.
```

```
        return self.grade
```

+1 for correct return.

Code Writing – Web Scraper 20 Points

Write a function named readHTML, that accepts a URL as a string as it's only parameter. Your method should read web page and return the word that immediately follows the first <h2> tag as a string. You may assume that there is a space character after the word which indicates the end of the word.

Once your method is complete, write the line of code to call it using `http://www.nytimes.com/` as the url and assign the return value to the variable myHTML. The module import line of code is given for you.

```
import urllib.request
```

```
def readHTML(url):                                        +1 method header
    response = urllib.request.urlopen(url)                +1 open the URL
    html = response.read()                                +1 read the URL
    strHTML = str(html)                                   +1 convert to a string
    count = 0
    startKeep = None
    result = ""
    for count in range(len(strHTML)):
        st = strHTML[count:count+4]
        ch = strHTML[count]
        if st == "<h2>":                                  +5 find the <h2> tag
            startKeep = count + 3                         -2 if they don't add 3.
            for ch in strHTML[startKeep:]:
                #print("in the loop")
                if ch == " ":                             +5 find the space after word
                    break
                else:
                    result = result + ch                  +3 locate/isolate correct result
    return result                                         +1 return the result

myHTML = readHTML2("http://www.nytimes.com/")             +2 call the method
```

Alternate method:

```
def readHTML(url):
        response = urllib.request.urlopen(url)
        html = response.read()
        htmstr = str(html)
        startPos = htmlstr.find("<h2>") + 4     #First the first <h2> tag, move past it
        endPos = htmlstr.find(" ", startPos)    #Finds the first space after the <h2> tag.
        word = htmlstr[startPos:endPos]         #Copy just the word we want.
        return(word)

myHTML = readHTML("www.nytimes.com")
```