Name : ______________________________

Grading 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 8 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. Base Conversions	5	
3. Expressions	16	
4. Okay Yeah	5	
5. Grocery Store	6	
6. For2While	6	
7. FizzBuzz	5	
8. Final Grade	10	
Total:	62	

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] algorithm

   Solution: A finite set of unambiguous instructions performed in a prescribed sequence to achieve a goal.

   (b) [3 pts] block

   Solution: One or more program statements that share the same level of indentation.

   (c) [3 pts] conditional statement

   Solution: A statement that controls the flow of execution depending on some condition. In Python the keywords if, elif, and else are used for conditional statements.

2. *(5 points)*
   For each of the following base conversion questions, give a brief answer:

   (a) [1 pt] Convert the decimal number 9 into binary:

   Solution: 1001

   (b) [1 pt] Convert the decimal number 172 into binary:

Solution: 10101100

(c) [1 pt] Convert the hexadecimal number 2A into decimal:

Solution: 42

(d) [1 pt] Convert the binary number 110101 into decimal:

Solution: 53

(e) [1 pt] Convert the decimal number 9 into hexadecimal:

Solution: 9

3. *(16 points)*
   Pretend you are the python interpreter. Evaluate each of the expressions below. Write down the value that they evaluate to, and the type of that value in the provided columns. If the expression is not valid python syntax, or will throw an exception, simply write ”Error”. The first line has been provided as an example.

Expression	Result	Type
1 + 2 * 3	7	int
3 % 2		
”a” * 3 + ”b”		
len(range(1,5,2))		
4.5 * 2		
4**2		
print(”Hi”)		
8 // 3		
”Test{}stuff{}”.format(1,3.8)		

Solution:

Expression	Result	Type
1 + 2 * 3	7	int
3 % 2	1	int
”a” * 3 + ”b”	”aaab”	str
len(range(1,5,2))	2	int
4.5 * 2	9.0	float
4**2	16	int
print(”Hi”)	None	NoneType
8 // 3	2	int
”Teststuff”.format(1,3.8)	’Test1stuff3.8’	string

Grading: +1 point for each correct answer.

4. *(5 points)*
   Analyze the following python code and answer the two questions below:

```
b = 5
def abc(a, b=1):
 c = 3
 if c < a:
     print("YEAH!")
 elif c > b:
     return a + b*c
 if c == 3:
     print("OKAY!")
```

```
ans = abc(10)
print(b)
```

(a) [3 pts] What does this code print?

Solution: YEAH!
OKAY!
5
Grading: +1 for each correct line.
-1 if they don't put them on individual lines
-1 if they put quotes around them.
-1 for each incorrect(extra) answer.

(b) [2 pts] What is returned to ans (state the exact value)?

Solution: None
Grading: +2 for "None".
+1 for indicating "Nothing" or some other non-value.

5. *(6 points)*
Pretend you are the python interpreter. Examine the following code to determine what it would print:

```
def findPrice(item, aNum):
    if (item == "peaches"):
        if (aNum > 10):
            return "{}! Too much!".format(aNum)
        print ("Peaches are $1.99")
        return 1.99
    elif (item == "grapes"):
        print(  "Grapes=$2.99. Number={}".format(aNum) )
        return 2.99
        print("Grapes are awesome")
    elif (item == "apples"):
        print ("Apples are $1.00")
    elif (item == "cherries" and aNum>=0):
        print ("Cherries are $3.00")
        if (aNum < 2):
            print ("2 bags")
        else:
            print ("Lots of bags")
        return 3.00
    else:
        print ("No such product")

d = findPrice("grapes",1)
e = findPrice("cherries", d)
```

What does the code above print?

Solution:

```
Grapes=$2.99. Number=1
Cherries are $3.00
Lots of bags
```

Grading: +2 points for each correct line.
-1 point for each ”extra” item that is written down.
-1 point for including extra quotes on one line.
-2 points for including extra quotes on multiple lines.
-2 points for not placing the answer on 3 lines.

6. *(6 points)*
Examine the following code:

```
aStr = "This is only a test!"
for char in aStr:
   print(char*2)
```

Now, the ”f” key on your keyboard has failed, so that you can not use the ”for” keyword. Re-write all of the code above using a while loop instead of a for loop. You must use a while loop, and may not use the ”for” keyword. (Your solution may not use the letter ’f’.)

Solution:

```
aStr = "This is only a test!"
index = 0
while index < len(aStr):
  char = aStr[index]
  print(char*2)
  index = index + 1
```

Grading:
+1 for using an index variable
+1 for starting index variable at zero
+1 for ending when index is no longer less than the length of aStr
+1 for incrementing the index variable
+1 for correctly indexing into aStr to get char.
+1 for printing the character twice (*2)

7. *(5 points)*

Write a function named `fizzbuzz` that takes in a single integer parameter. Your function should print out the numbers from 1 to the value of the parameter you passed in, inclusive. Exceptions: If the number is a multiple of three, you should print out the word “Fizz” **instead** of the number. If the number is a multiple of five, you should print out “Buzz” **instead** of the number. Do the check for ”multiple of 3” first, so if a number is a multiple of both 3 and 5 (such as 15) you will print out “Fizz”. You may assume the integer parameter is non-negative. (If it is zero, your function should do nothing.)

Example run:

```
>>> fizzbuzz(5)
 1
 2
 Fizz
 4
 Buzz
>>>
```

Solution:

```
def fizzbuzz(num):
   for i in range(1,num+1):
      if i % 3 == 0:
         print("Fizz")
      elif i % 5 == 0
         print("Buzz")
      else:
         print(i)
```

Grading:
+1: Correct function header
+1: Correct loop (Loops from 1 to num+1)
+1: Prints Fizz for multiples of 3 (and no others!)
+1: Prints Buzz for multiples of 5 (and no others!)
+1: Prints out num for numbers that are not multiples of 3 or 5.

8. *(10 points)*
Write a function named `finalGrade` that takes in no parameters. Your function should interactively prompt (ask) the user for their current class grade, the percentage of the total grade that the final is worth, and what grade they desire in the class.

The function should then calculate the minimum grade required on the final exam to achieve the desired grade. (This may end up being over 100% if the student has a low class average and desires a high overall grade!). Print the result back to the user (using the example format below). Be sure to format the answer to include only two digits after the decimal point.

Math Help:

-The overall class grade is calculated as:

$TotalGrade = GradeSoFar * (1.0 - FinalPercent) + (FinalPercent * FinalScore)$

So the needed grade on the final would be calculated as:

$$FinalScore = \frac{DesiredGrade - GradeSoFar * (1.0 - FinalPercent)}{FinalPercent}$$

Example test case:

```
>>> finalGrade()
What is your current grade so far? 50.0
What percentage is your final worth as a float? 0.20
What is your desired grade? 60.0
You need a grade of 100.00 on the final exam!
>>>
```

Solution:

```
def finalGrade():
   GSFS = input("What is your current grade so far?")
   gsf = float(GSFS)
   FPS = input("What percentage is your final worth as a float?")
   fp = float(FPS)
   DGS = input("What is your desired grade?")
   dg = float(DGS)


   FinalScore = (dg - (gsf * (1.0 - fp) ) ) / fp
   ans =  "You need a grade of {:.2f} on the final exam!".format(FinalScore)
   print(ans)
```

```
finalGrade()
```

Grading: 1 point for a correct header.
1 point for the 3 correct input statements. 2 points for converting each input to a float. 3 points for correctly implementing the formula. 2 points for correctly formatting the answer to 2 decimal places. 1 point for printing the answer.

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!