CSci 1500 - Test 1 - 100 pts. Name______________________________

1. (10 pts.) Briefly define (if appropriate give an example) of each of the following:

a) debugging

The process of finding and removing errors from a program

b) syntax error

An error that makes it impossible to parse and therefor impossible to interpret the code

c) semantic error

An error that causes the program to do something other than what the programmer intended.

Syntax is ok. It runs but the outcome isn’t as intended.

d) run-time error

Appear after the program has started running. Exceptions – indicate something bad has happened.

e) script

A program stored in a file. Usually one that will be interpreted.

2. (10 pts.) Perform the following conversions. **NOTE: You must show how you obtained your answer – an answer with no support will not receive credit.**

a) Convert the decimal number 1019 to hexadecimal. Then, convert the hexadecimal to binary.

1019/16 = 63 r 11 ↑
63/16 = 3 r 15
3/ 16 = 0 r 3

And knowing 11 = B and 15 = F and reading up: 1019 (decimal) = 3FB (hexadecimal)

3FB to Binary: convert each digit to 4 bit binary equivalent
3 = 0011
F = 1111
B = 1011
3FB = 001111111011

$1019_{10} = 3FB_{16} = 001111111011_2$

b) Convert the binary number 100111100010 to hexadecimal. Then, convert the hexadecimal to decimal.

1	0	0	1	1	1	1	0	0	0	1	0
9				E				2			
8	4	2	1	8	4	2	1	8	4	2	1

$9 * 16^2 + 14 * 16^1 + 2 * 16^0 = 2530$

$100111100010_2 = 9E2_{16} = 2530_{10}$

3. (20 pts.) Write a **pseudocode** for a program that will prompt for and read the length and width of a rectangular shaped room, measured in feet, and then calculate and display the **area** of the floor of the room, **measured in *square yards*** and **rounded** to **2 decimal places** (hundredths). You may assume that the number of feet entered by the user will be positive integer values. Include a description of the variables that you use in your pseudocode, specifying names and data types.

Notes:

- 1 square yard = 9 square feet.
- Your program's output should look like that shown in the following example. In this example, the user input is shown in **bold** – these values are only *example* values – **your solution should work for any valid input**.

```
Enter room length in feet: 8
Enter room width in feet: 11
Room area = 9.78 square yards
```

Problem: Given the input of length (float) and width (float), this program will calculate and display the area (float) of a room converted to square yards, rounded to 2 decimal places.

Variables:

```
      length (float): to store the input of room length in feet
      width (float): to store the input of the room width in feet
      area(float): to store the room area (length*width) converted to
      square yards (*1/9)
```

Pseudocode:

```
   •  Display and assign length to input (“Enter room length in feet:
      “). Convert to float.
   •  Display and assign width to input (“Enter room width in feet: “).
      Convert to float.
   •  Let (or assign) area = (length)*(width)(*1/9) #converted to
      square yards
   •  Round area to 2 decimal places
   •  Display “Room area = “ and area and “square yards”
```

4. (20 pts.) Write a **complete Python program** from your pseudocode for the last problem.

```
'''Test 1 Problem 4: Given the input of length (float) and width
(float),
this program will calculate and display the area (float) of a room
converted to square yards, rounded to 2 decimal places.
'''
length = float(input("Enter room length in feet: "))
width = float(input("Enter room width in feet: "))

#Calculate area and convert to square yards, round to 2 decimal places

area = round(length*width/9, 2)

print("Room area =", area, "square yards")

Output:
>>>
Enter room length in feet: 8
Enter room width in feet: 11
Room area = 9.78 square yards
>>>
```

5. (20 pts.) Write a **pseudocode** solution for the following problem:
Write a program that converts **seconds** given into an equivalent amount of time given in **minutes** and **seconds**. The program should first prompt the user to enter the total number of seconds, read the number in, and then convert and display what the given total seconds is equal to in minutes and seconds. You should assume that the number of total seconds entered will be a positive integer. Note that the number of minutes and remainder seconds will also be integer values. Conversion fact: 1 minute = 60 seconds.

Include a description of the variables that you use in your pseudocode, specifying names and data types. Efficiency matters. **Note:** Assume that the program output will look like that shown in the following example. In this example, the user input is shown in **bold** – the output values are *example* values – **your solution should work for any valid input**.

```
Enter number of seconds: 399
399 seconds = 6 minutes and 39 seconds
```

Problem: Convert given input of seconds (int) into an equivalent amount of minutes (int) and remaining seconds (int)

Variables:

- seconds (int): to store input or given number of seconds
- minutes (int): to store the number of whole minutes in the number of given seconds
- rseconds (int): to store the remaining seconds

Pseudocode:

- Display and let (or assign) seconds = input “Enter the number of seconds: “
- Convert seconds to int
- Use integer division. Let (or assign) minutes = seconds//60
- Use the modulus to find remaining seconds. Let rseconds = seconds % 60
- Display seconds, “seconds = ”, minutes, “minutes and “, rseconds, “seconds”

6. (20 pts.) Write a **complete Python program** from your pseudocode for the last problem.

```
Output:
>>>
Enter number of seconds: 399
399 seconds = 6 minutes and 39 seconds
>>>
```

```python
'''Test 1 Problem 6: Convert given input of seconds (int)
into an equivalent amount of minutes (int) and remaining seconds,
rseconds(int)
'''
seconds = int(input("Enter number of seconds: "))
minutes = seconds//60 #use integer division to find whole minutes
rseconds = seconds%60 #use modulus division to find remaining seconds

print(seconds, "seconds =", minutes, "minutes and", rseconds,
"seconds")
```