CSCI 101: Introduction to Computer Science

Exam 2

April 12, 2017

NAME:

To receive full credit you must clearly show all work and justify your answers. No books, notes, calculators, or cell phones are allowed during this exam. This is a 50 minute exam.

Question:	1	2	3	4	5	6	7	Total
Points:	15	20	10	10	10	10	0	75
Score:								

1. (15 points) Answer the following questions. Justify your answers.

   (a) What is a loop?

   (b) What are the three registers in Pep/8's cpu?

   (c) Describe the difference between low level programming languages and high level programming languages.

   (d) State 3 mnemonic instructions in Pep/8's assembly language.

   (e) (True or False) Java programs can only be run on machines they were compiled for (explain your answer).

2. (a) (5 points) Use the ASCII table to convert “Up” into Hexadecimal.
   (b) (5 points) Write a Pep/8 machine language program to print “Up”
   (c) (5 points) Write an Assembly language program to print “Up”
   (d) (5 points) Write a Python program to print “Up”

3. Consider the following Python code.

```
def plus(x)
        c= 1
        s = 0
        while c <= int(x):
                s = s + c
                if c == 1:
                        print (c)
                else:
                        print ("+", c)
                c = c+1
        return (s)

n = input(‘‘Please enter an upper bound: ’’)
sum = plus(n)
print (sum)
```

(a) (5 points) Describe what each line of the code does.

(b) (5 points) If a value of 6 is inputted, what will be the program calculate?

4. Consider the following code for an Assembly language program in Pep/8.

```
                BR              main
result:         .WORD           0x0000
num1:           .BLOCK          2
num2:           .BLOCK          2
num3:           .BLOCK          2

main:           LDA             result,d
                DECI            num1,d
                ADDA            num1,d
                DECI            num2,d
                SUBA            num2,d
                DECI            num3,d
                ADDA            num3,d
                STA             result,d
                DECO            result,d
                STOP
                .END
```

(a) (5 points) Describe what each line of the code does.

(b) (5 points) Describe what the program does.

5. Consider the following Python code:

```
def square(x):
    r = x * x
    return r

print (‘‘This program will print out the squares’’)
print (‘‘of the numbers from 1 up to an entered value.’’)
i = int(input(‘‘Enter the largest square you would like to see: ’’))
n = 1
while n<=i:
    s = square(n)
    print (s)
```

The program should read in an integer i and print out the square of every number 1 and i. However, after an integer is entered, it keeps printing out numbers and never stops.

(a) (5 points) Find and describe the error in the above program.

(b) (5 points) Correct the code so that it only prints out the square of each number between 1 and i.

6. (10 points) Write a Python program to draw a regular hexagon (6 equal sides) using the turtle package. (**Hint:** The interior angles of a regular hexagon are 120°.)

7. (10 points (bonus)) Consider the following code.

```
def fib(x,y):
        count = 0
        F = 0
        G = 1

        while count <= y:
                F = F + G
                G = F - G
                if count >= x:
                        print (‘‘F_’’, count, ‘‘ is ’’, G)
                        count = count + 1
                else:
                        count = count + 1

a = int(input(‘‘Please input a lower bound: ’’))
b = int(input(‘‘Please input a upper bound: ’’))

fib(a,b)
```

If you enter $a = 2$ and $b = 7$, determine what the program prints out.