Name: _____

CIS 122

Midterm Exam

July 18, 2011

1. (*14 points*) Evaluate the following simple expressions (as Python would).

(a)   `2 + 3 * 4`

(b)   `10 / 4`

(c)   `10 * 1.0`

(d)   `10.0 / 4`

(e)   `"Beseech"[5]`

(f)   `"Beseech"[-2]`

(g)   `"Beseech"[2:5]`

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2. (*12 points*) Evaluate the following logical expressions (as Python would).

(a)   `10 <= 15 <= 20`

(b)   `17.5 > 17.5`

(c)   `"ABC" == "abc"`

(d)   `"abcdefg"[3] == "d"`

(e)   `not True or False`

(f)   `ord( "?" ) == 126 and ord( "?" ) != 126`

3. (*10 points*) Consider the following Python code:

```
x = 4
y = 10
if x > y:
    x = x + 1
    y = x * y
elif x < y:
    x = x - 1
    y = x * 2
else:
    x = y
    y = x
```

After running this code, what values would x and y have?

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4. (*14 points*) Draw a stack diagram for the following code.

Remember to include all stack frames, as well as all defined functions and variables.

```
def foo(u,v):
    sum = u+v
    prod = u*v
    ans = bar(sum, prod)
    return ans

def bar(x,y):
    z = 10*x
    return y+z

def baz(n):
    m = foo(n+1, n-1)
    return n + m

a = baz(3)
```

5. (*15 points*) What does the following function do?

Dont just list the steps it takes. Tell me what its purpose is!

You may assume that **x** and **y** are both integers.

```
def mystery(x,y):
    """What do I do?"""

    difference = x - y
    if difference > 0:
        return x
    else:
        return y
```

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6. (*15 points*) What does the following function do?

Dont just list the steps it takes. Tell me what its purpose is!

You may assume that **string** is a string, and that **element** is a single-character string.

```
def stringChecker(string, element):
    """What do I do?"""

    if string == "":
        return False
    elif string[0] == element:
        return True
    else:
        return stringChecker(string[1:], element)
```

7. (*20 points*) Use recursion to write a function isEven(x)

The function isEven(x) should return True if x is even. Otherwise, it should return False. You may assume x is a non-negative integer.

You may find the following information useful.

1. 0 is even

2. 1 is odd

3. In general, an integer is even if the integer two numbers before it is also even.

NOTE You may **not** use the % operator when writing this function.