**Assignment #5**

**Chapter 6, Python**

**57 points**

1. Given the following: 2 + 10 / 2 \* 8 – 5 \* 2 - 3 \* 2 +8
   1. (3pts) Show how the following statement would be evaluated assuming **no precedence** rules and **right to left order**. Use parentheses and show the result. (right to left with division will mean 10/2 is 2 divided by 10).

((((((((8+2) \* 3) – 2) \* 5 ) - 8 ) \* 2 ) / 10 ) + 2) = 28.4

* 1. (3pts) Show how the statement would be evaluate assuming **no precedence** order and **left to right** evaluation. Use parentheses and show the result.

((((((((2+10) / 2) \* 8) – 5) \* 2) – 3) \* 2) + 8) = 174

* 1. (3pts) Show how the statement would be evaluated assuming **left to right** evaluation and **normal math** **precedence order** use parentheses and show the result.

2 + ((10/2) \* 8) – (5\*2) – (3\*2) + 8 = 34

Given the following:

struct Cell {

int num1;

float num2;

} ;

struct Person {

int age;

float income;

};

Cell t, s;

Person p1, p2, p3;

s.num1 = 0; s.num2 = 2.5; //initialize s

p2.age = 25; p2.income = 9999.99; //initialize p2

t = s; //assignment one

p1 = s; //assignment two

p2 = p3; //assignment three

p3.age = s.num1; //assignment four

p3.income = s.num1; //assignment five

p2.age = t.num2; //assignment six

1. **(12pts)** For each assignment state above state whether it will compile or not and why. Also list if there will be any coercions or widening or shortening of datatypes.
2. **(6pts)** Compare and contrast C’s **malloc** and **free** functions with C++’s **new** and **delete** operators. Explain how they both work. Use safety as the primary consideration in the comparison.

New / Delete calls the object's constructor or destructor after allocating memory(much safer). Delete without

Malloc / Free just allocates / deallocates the memory.

1. **Let the function fun be defined as:**

int fun(int \*k) {

\*k += 4;

return 3 \* (\*k) -1;

}

Suppose fun was used in a program as follows:

void main() {

int i = 10, j = 10, sum1, sum2;

sum1 = (i / 2) + fun(&i);

sum2 = fun(&j)) + ( j / 2);

}

**What are the values of sum1 and sum2**

1. (3pts) If the operands in the expressions are evaluated left to right (with normal precedence rules)?

Sum1 = 46

sum2 = 48

1. (3pts) if the operands in the expressions are evaluated right to left (with normal precedence rules)?

Can't assign a variable to a constant..

1. (3pts) Show an examples of using c++’s unary operator where it could be interpreted differently depending on the order of operations.

Sum = 3 \* i++

depending could add to i then multiply or multiply then add

1. (6pts) What results would be printed after the print statements in the following Python code? Explain what is happening.

mylist = ["alpha", "beta", "gamma", "delta", ["un", "deux", "trois"]]

yourlist = mylist

print yourlist

yourlist[4][0] = ["uno", "dos"]

print yourlist

print mylist[2:4]

print mylist[-3:]

output:

['alpha', 'beta', 'gamma', 'delta', ['un', 'deux', 'trois']]

['alpha', 'beta', 'gamma', 'delta', [['uno', 'dos'], 'deux', 'trois']]

['gamma', 'delta']

['gamma', 'delta', [['uno', 'dos'], 'deux', 'trois']]

What's happening:

Print the list. Change first element of the fifth element to [uno, dos]

print the changed list

print elements 2 to 4(not including 4) of mylist

print the final 3 elements in mylist

1. **Write Python programs for the following – include a screenshot of your output along with your code.**

(6pts) Write a function called **RemoveDups** that takes a list as its argument. If the list consists of consecutive repeated elements, they should be replaced with a single copy of the element. The order of the elements should not be changed.

For Example:

>>> print RemoveDups([1,1,1,1,2,2,3,4,4,5,5])

[1,2,3,4,5]

def removeDups(someList):

mySet = set()

newList = set( x for x in someList if x in mySet or mySet.add(x) )

return list(newList)

(6pts) Write a Python class called Retail item that holds description, unitsOnHand, and price. Add methods to decrease the units on hand and to access the price. Use your class to create a list of three items. Ask the user which one they want and how many and decrement the unitsOnhand and print the final price. Assume 8% tax.

(6pts) Write a class that implements a struct. In your struct store Student information such as name, netid, and gpa. Write a function that can access a student in a list of 5 structs by netid and print their name and gpa. Show that your function works by calling it.