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**ITCS 1212L**

**Post-lab 2**

**You are going to practice on the following topics:**

Sequence, Flowcharts, Identifiers, Fundamental data types, Declaration of variables, Initialization of variables, assignment operators, arithmetic operators, compound assignments, increase and decrease, standard input and output.

1. **Answer the following questions based on what you learned in lab and lab lesson 2:**
2. What are the rules of declaring identifiers in C++?

**Must start with a letter. The identifier must contain, letters, numbers, or underscores only. The identifier cannot be a reserved term.**

1. Use your own judgment to find a correct replacement for each incorrect name

int a-b, **int** **aThruB;**

a?b, **int aOrB;**

a b, **int aB;**

my Integer, **int myInteger;**

total discount, **float totalDiscount;**

int 1a, **int a1;**

1b; **int b1;**

int A, a; **int a, alpha;**

1. What are the differences between different data types as far as the way they are stored in memory? **They take up different ammounts of memory**
2. List the compound operators? **+=, -=, \*=, /=, %=, =+, =-, =\*, =/, =%**
3. When do we use compound assignment operators? **When we want to perform arithmetic operations and make an assignment on the same command line**
4. Provide an example and rewrite the compound assignment using basic operators. **Example: a++; is the same as a = a + 1;**
5. Think about a simple program such as a simple calculator that can only add two numbers at a time. Study the following logical sequences and create one for multiplication. **Draw a small flowchart depicting the program as well.**

* get the two numbers
* add them
* show the outputs

**I can’t really draw using word, but I can explain. Using the symbolic boxes from lecture to represent input, output, and aritmatic, we would need to perform the following steps (in a straight line of execution. No branching alternatives. Simply execution by order of command).**

**Input: for number1;**

**Input: for number2;**

**Arithmatic: Multiply number1 and number2; Save the result as number3;**

**Output: Show the value of number3;**

1. **Circumference and Area**

Write the algorithm and program that will output the circumference and area of a circle. It gets the radius from user as input. Pi= 3.14

Input: Please Enter the radius of the circle: 1

Output:

The circumference is : 6.28

The Area is : 3.14

**Input: radius;**

**Arithmatic: circumference = (2 \* 3.14) \* radius;**

**Arithmatic: area = 3.14 \* radius;**

**Output: Show the value of circumference and area;**

# Salary Raise

Write a program, that will calculate an employee’s new salary based on the percent raise and on old salary. The user will enter the old salary and the percent raise (as a percent, like 5 percent, not .05) The program will calculate the raise and the new salary and print both the amount of raise and the new salary. **Draw the flowchart for the same.**

Sample Input:

Please enter your old salary: $100,000

What is the percentage raise: 5

Output:

Your new salary is: 105,000

**//declare variables**

**Float oldSalary, percent, newSalary;**

**//retrieve input**

**Cout << “Please enter your old salary: “;**

**Cin >> oldSalary;**

**Cout << “Please enter your raise percent: “;**

**Cin >> percent;**

**//calculate  
percent = percent \* .01;**

**percent = oldSalary \* percent;**

**newSalary = oldSalary \* percent;**

**//display**

**cout << endl << endl << “You received a raise of $” << percent << “! Making your new salary $” << newSalary << “!” << endl;**

# Toy Store Profit

A box of toys contains 120 toys that are packed into 10 tubes. Each tube costs the store $5 to purchase from the supplier. The store will mark each toy $1.00 as the price. Write a program that asks the user to enter the number of toys sold in the store and then calculates and displays the profit the store has made from these sold toys. **NOTE: Assume that the store can only buy toys by the box. So assume that the store has already bought enough boxes. [Hint : Try to calculate profit gained per toy sold]**

Sample input:

Enter how many toys the store has sold: 121

Output:

The profit is: $20.42

**//declare variables**

**Int toysSold;**

**float profit;**

**//retrieve input**

**Cout << “Please enter the number of toys sold:”;**

**Cin >> toysSold;**

**//calculate**

**//it costs 41.6666 cents per toy**

**//therefore each toy sold makes 58.3333 cents profit**

**//if you want to consider the cost of each box to cover the minimum required to sell the number of toys sold, we could use the operation boxesStocked = (toysSold % 120) +1; however, I was told not to include this as it complicates the matter as was not the point of this exercise**

**profit = toysSold \* .583;**

**//display**

**Cout << endl << endl << “You sold “ << toysSold << “ toys! That means you made $” << profit << “ profit!” << endl;**

# Work Days and Hours

Write a program that asks the user to enter how many hours they spent working on a project. The program will print how many days and hours this is. (Use the modulus operator %)

Sample Input/Output:

Input: How many hours did you work on the project? : 100

Output: That is 4 days and 4 hours.

**//declare variables**

**Int days, hours, totalHours;**

**//retrieve input**

**Cout << “How many hours did you spend on your project?:”;**

**Cin >> totalHours;**

**//calculate**

**days = totalHours / 24;**

**hours = totalHours % 24;**

**//display**

**Cout << endl << endl << “You spent “ << days << “ days and “ << hours << “ hours on your project.”**

# Calorie Counter

A box of cookies holds 60 cookies. The calorie information on the box claims that there are 12 servings in the bag and that each serving equals 200 calories. Write a program that asks the user to enter how many cookies she/he ate and then print the total number of calories consumed.

Sample input:

How many cookies did you eat? : 100

The Calories you consumed are : 4000

**//declare variables**

**Int boxCalories, cookieCalories, cookiesEaten, caloriesConsumed;**

**//retrieve input**

**Cout << “How many cookies did you eat?:”**

**Cin >> cookiesEaten;**

**//calculate**

**boxCalories = 200 \* 12;**

**cookieCalories = boxCalories / 60;**

**caloriesConsumed = cookiesEaten \* cookieCalories;**

**//output**

**Cout << endl << endl << “You consumed “ << caloriesConsumed << “ calories!”;**