CS 101 LAB #2
VARIABLES AND OPERATORS

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GOAL OF LAB #2

- In this lab, you will write programs to help you understand the following concepts:
  - Variables and arithmetic expressions
  - Comparisons using relational operators
  - Performing integer division and remainder operations

- You must submit two programs, demonstrating two different concepts from those listed above.

- Please ensure you write code neatly, with proper indentations and comments.

VARIABLES, ARITHMETIC EXPRESSIONS

2.16 *(Arithmetic)* Write a program that asks the user to enter two numbers, obtains them from the user and prints their sum, product, difference, quotient and remainder.

2.17 *(Final Velocity)* Write a program than asks the user to enter the initial velocity and acceleration of an object, and the time that has elapsed, places them in the variables u, a, and t, and prints the final velocity, v, and distance traversed, s, using the following equations.

    a) $v = u + at$

    b) $s = ut + \dfrac{1}{2}at^2$

VARIABLES AND COMPARISONS

2.18 *(Comparing Values)* Write a program that asks the user to enter the highest rainfall ever in one season for a country, and the rainfall in the current year for that country, obtains the values from the user, checks if the current rainfall exceed the highest rainfall and prints an appropriate message on the screen. If the current rainfall is higher, it assigns that value as the highest rainfall ever. Use only the single-selection form of the `if` statement you learned in this chapter.

2.19 *(Arithmetic, Largest Value and Smallest Value)* Write a program that inputs three different integers from the keyboard, then prints the sum, the average, the product, the smallest and the largest of these numbers. Use only the single-selection form of the `if` statement you learned in this chapter. The screen dialogue should appear as follows:

```
Enter three different integers: 13 27 14
Sum is 54
Average is 18
Product is 4914
Smallest is 13
Largest is 27
```

DIVISION AND REMAINDER OPERATORS

2.20 (*Converting from seconds to hours, minutes and seconds*) Write a program that asks the user to enter the total time elapsed, in seconds, since an event and converts the time to hours, minutes and seconds. The time should be displayed as hours:minutes:seconds. [*Hint*: Use the remainder operator]

2.24 (*Odd or Even*) Write a program that reads an integer and determines and prints whether it's odd or even. [*Hint*: Use the remainder operator. An even number is a multiple of two. Any multiple of two leaves a remainder of zero when divided by 2.]

2.26 (*Multiples*) Write a program that reads in two integers and determines and prints whether the first is a multiple of the second. [*Hint*: Use the remainder operator.]

2.30 (*Separating Digits in an Integer*) Write a program that inputs one five-digit number, separates the number into its individual digits and prints the digits separated from one another by three spaces each. [*Hint*: Use combinations of integer division and the remainder operation.] For example, if the user types in 42139, the program should print

4	2	1	3	9

UNDERSTANDING CHARACTER DATA TYPE (OPTIONAL)

2.29 *(Integer Value of a Character)* Here's a peek ahead. In this chapter you learned about integers and the type `int`. C can also represent uppercase letters, lowercase letters and a considerable variety of special symbols. C uses small integers internally to represent each different character. The set of characters a computer uses together with the corresponding integer representations for those characters is called that computer's character set. You can print the integer equivalent of uppercase A, for example, by executing the statement

```
printf( "%d", 'A' );
```

Write a C program that prints the integer equivalents of some uppercase letters, lowercase letters, digits and special symbols. As a minimum, determine the integer equivalents of the following: A B C a b c 0 1 2 $ * + / and the blank character.