TUTORIAL

1. List if the following identifiers are valid or invalid. If invalid, state the rule which it violates.

   a. Power
   b. density
   c. m1234
   d. newamp
   e. 1234
   f. abcd
   g. total
   h. tangent
   i. Absval
   j. computed
   k. b34a
   l. 34ab
   m. volts$
   n. a2B3
   o. while
   p. minVal
   q. sine
   r. $sine
   s. cosine
   t. speed
   u. netdistance
   v. sum
   w. return
   x. stack

2. Assume the following functions have been written:

   `getLength(), getWidth(), calcArea(), displayArea()`

   a. From the function names, what do you think each function might do?

   b. In what order do you think a **main()** function might execute these functions (based on their names)?

3. Determine names for functions that do the following:

   a. Find the average of a set of numbers.

   b. Find the area of a rectangle.

   c. Find the minimum value in a set of numbers.

   d. Find the density of a steel door.

   e. Sort a set of numbers from lowest to highest.

4. Determine data types appropriate for the following data:

   a. The average of four grades

   b. The number of days in a month

   c. The length of the Golden Gate Bridge

   d. The numbers in a state lottery

   e. The distance from Brooklyn, NY to Newark, NJ

   f. The single-character prefix that specifies a component type

5. Show how the name KINGSLEY is stored in a computer that uses the ASCII code by drawing a diagram similar to Figure 2.7 (as in your lecture notes).

6. For the following correct algebraic expressions and corresponding incorrect C++ expressions, find the errors and write corrected C++ expressions:

Algebra	C++ Expression
a. $(2)(3) + (4)(5)$	$(2)(3) + (4)(5)$
b. $\dfrac{6 + 18}{2}$	$6 + 18 / 2$
c. $\dfrac{4.5}{12.2 - 3.1}$	$4.5 / 12.2 - 3.1$
d. $4.6(3.0 + 14.9)$	$4.6 (3.0 + 14.9)$
e. $(12.1 + 18.9)(15.3 - 3.8)$	$(12.1 + 18.9) (15.3 - 3.8)$

7. Determine the values of the following **integer** expressions:

a. `3 + 4 * 6`

b. `3 * 4 / 6 + 6`

c. `2 * 3 / 12 * 8 / 4`

d. `10 * (1 + 7 * 3)`

e. `20 - 2 / 6 + 3`

f. `20 - 2 / (6 + 3)`

g. `(20 - 2) / 6 + 3`

h. `(20 - 2) / (6 + 3)`

i. `50 % 20`

j. `(10 + 3) % 4`

8. Determine the value of the following **floating-point** expressions:

a. `3.0 + 4.0 * 6.0`

b. `3.0 * 4.0 / 6.0 + 6.0`

c. `2.0 * 3.0 / 12.0 * 8.0 / 4.0`

d. `10.0 * (1.0 + 7.0 * 3.0)`

e. `20.0 - 2.0 / 6.0 + 3.0`

f. `20.0 - 2.0 / (6.0 + 3.0)`

g. `(20.0 - 2.0) / 6.0 + 3.0`

h. `(20.0 - 2.0) / (6.0 + 3.0)`

9. Assume that *amount* stores the integer value 1, *m* stores the integer value 50, *n* stores the integer value 10, and *p* stores the integer value 5. Evaluate the following expressions:

a. `n / p + 3`

b. `m / p + n - 10 * amount`

c. `m - 3 * n + 4 * amount`

d. `amount / 5`

e. `18 / p`

f. `-p * n`

g. `-m / 20`

h. `(m + n) / (p + amount)`

i. `m + n / p + amount`

10. State whether the following variable names are valid. If they are invalid, state the reason.

a. prod_a

b. c1234

c. abcd _c 3

d. 12345

e. newamp

f. watts

g. $total

h. new$al

i. a1b2c3d4

j. 9ab6

k. sum.of

l. average

m. volts1

n. finvolt

11.

    a. Write a declaration statement to declare that the variable count will be used to store an integer.

    b. Write a declaration statement to declare that the variable volt will be used to store a floating-point number.

    c. Write a declaration statement to declare that the variable power will be used to store a double-precision number.

    d. Write a declaration statement to declare that the variable keychar will be used to store a character.

12. Write declaration statements for the following variables:

    a. num1, num2, and num3 used to store integer numbers

    b. amps1, amps2, amps3, and amps4 used to store double-precision numbers

    c. volts1, volts2, and volts3 used to store double-precision numbers

    d. codeA, codeB, codeC, codeD, and codeE used to store characters

13. Rewrite each of these declaration statements as three separate declarations:

    a. int month, day = 30, year;

    b. double hours, volt, power = 15.62;

    c. double price, amount, taxes;

    d. char inKey, ch, choice = 'f';