ALBUKHARY INTERNATIONAL UNIVERSITY

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SCHOOL OF COMPUTING AND INFORMATICS

COURSE DETAILS	
SCHOOL	SCHOOL OF COMPUTING AND INFORMATICS
COURSE NAME	PROBLEM SOLVING AND PROGRAMMING FUNDAMENTALS
COURSE CODE	CCC 1123
LAB TUTOR	DR SITI ZAINAB IBRAHIM MS SYAZA LYANA MAHADZIR DR AKIBU MAHMOUD ABDULLAHI
SEMESTER & YEAR	SEMESTER 1, YEAR 3
LAB ACTIVITY	LAB 7: Operators and Expressions
CLO	CLO2: Construct computer program codes by applying suitable programming tools, structures, and techniques (C3, PLO2) CLO3: Apply suitable programming structures and techniques in solving problems (P5, PL03).

Lab 7: Operators and Expressions

Questions

Review

1. What is an operator? List down different types of operators that are included in C.

2. Describe the five arithmetic operators in C.

3. What is the name of the process for converting the value of an expression to a different data type? State the syntax for this process.

4. In what order are the operations carried out within an expression that contains nested parentheses?

5. Describe the five unary operators discussed in this chapter.

6. What is the relative precedence of the unary operators compared with the arithmetic operators?

Problems

1. Suppose a, b, and c are integer variables that have been assigned the values a = 8, b = 3, and c = -5. Determine the value of each of the following arithmetic expressions.
    a. a + b + c
    b. a * b / c
    c. a / b
    d. (a * c) % b
    e. a / c

2. Suppose x, y and z are floating-point variables that have been assigned the values x = 8.8, y = 3.5 and z = -5.2. Determine the value of each of the following arithmetic expressions.
    a. x + y + z
    b. (x / y) + z
    c. x / y
    d. 2 * x / (3 * y)

3. Suppose c1, c2, and c3 are character-type variables that have been assigned the characters E, 5 and ?, respectively. Determine the numerical value of the following expressions based upon the ASCII character set.
    a. c1
    b. '2' + '2'
    c. c2 - 2
    d. 3 * c2
    e. c3 + '#'

4. A C program contains the following declarations:

```
int i, j;
long ix;
short int s;
float x;
double dx;
char c;
```

Determine the data type of each of the following expressions:

a. i + c
b. ix + j
c. dx + x
d. ix + c
e. i + x

5. A C program contains the following declarations and initial assignments:

```
int i = 8, j = 5;
float x = 0.005, y = -0.01;
char c = 'c', d = 'd';
```

Determine the value of each of the following expressions. Use the values initially assigned to the variables for each expression. Show your calculations.

a. (3 * i – 2 * j) % (2 * d – c)
b. (i – 3 * j) % (c + 2 * d) / (x – y)
c. ++i
d. y--
e. c > d
f. x < y
g. (2 * x + y) == 0
h. !(c == 99)
i. (i > 0) && (j < 5)
j. (x > y) && (i > 0) || (j < 5)

6. A C program contains the following declarations and initial assignments:

```
int i = 8, j = 5, k;
float x = 0.005, y = -0.01, z;
char a, b, c = 'c', d = 'd';
```

Determine the value of each of the following assignment expressions. Use the values initially assigned to the variables for each expression. Show your calculations.

a. k = (i + j)
b. x *= 2
c. i = j
d. i %= j
e. k = c

f. k = (j == 5)? i : j
g. a = b = d
h. z = (x >= 0)? x : 0
i. z = k = x
j. a = (c < d)? c : d

Programming

1. Write a C program that declares variables to represent the length and width of a room in feet, and the price of carpeting per square foot in dollars and cents. Name your program as carpet.c. Initialize appropriate values to the variables. Compute and display, with explanatory text, the cost of carpeting the room.

2. Write a program that declares a minutes variable that represents minutes worked on a job, and assign a value. Name your program as time.c. Display the value in hours and minutes. For example, 197 minutes becomes 3 hours and 17 minutes.

3. Write a program to convert Fahrenheit temperature to Centigrade. Use the normal human body temperature of 98.6 degrees Fahrenheit, as the test case. Use the formula Centigrade = 5/9 (Fahrenheit – 32). Save the program as FahrenheitToCentigrade.c.

4. Write a program that displays FirstName, LastName, Address, and Phone on one line of output, and your first name, last name, address, and phone number on the second line. The output should be follows:

FirstName	LastName	Address	Phone
Siti Zainab	Ibrahim	Alor Setar	123-456789

Save your program as Escape.c.