International University for Science & Technology (IUST)

College of Information Technology

Assignment 2

Student Name	
Year/Group	2009/2010

Assignment title:	**Introduction to variables**

Unit title:	Computer Skills II (C Language)	**Subject Tutor:**	Mr. mhd. Mazen al-Mustafa
Start:		**Coordinator**	Mr. mhd. Mazen al-Mustafa
Submission:			
Actual Submission date:		**Grading.**	
Learning Outcomes covered:			
	• **If Statement, Switch case.**		
Resources:			
	• C How To Program fifth Edition, by H.M. Deitel & P.J. Deitel, • Teacher's handouts • internet		

True/False

1. The symbol = is the C equality operator.

2. The following decision structure is invalid:

```
if  x <= y
    printf("%lf", x);
else
    printf("%lf", y);
```

3. Conditions are said to be mutually exclusive if at most one condition can be true at a time.

4. A compound statement is a sequence of statements enclosed in {} braces.

5. The following program segment gives x and y the same value if the condition is true:

```
if (x > y) {
    y = x;
    x = y;
}
```

6. Pseudocode is a special form of machine language produced by the C compiler.

7. Program readability can be improved by indenting both the true and false tasks of all if-else statements.

8. An algorithm should be carefully hand traced before it is implemented in C.

9. The statements on the left always give p the same value as the code on the right, but the code on the right may execute faster.

```
if (x > 15)
    p = p * x;
if (x > 30)

p = 2 * p * x;
```

```
if (x > 15)
    p = p * x;
else if (x > 30)
    p = 2 * p * x;
```

10. If the value of control is 5, the following switch statement will cause a run-time error.

```
int control;
scanf("%d", control);
switch (control) {
    case 1:
        printf("one");
        break;

    case 2:
        printf("two");
        break;

    case 3:
        printf("three");
        break;

    case 4:
        printf("four");
    }
```

Multiple Choice

1. Which of the following is not a *relational operator*?
   a. #
   b. >
   c. ==
   d. <
   e. >=

2. Which of the following is not a *logical operator*?
   a. &&
   b. !
   c. ||
   d. not

3. For what exact range of values of variable x does the following code segment display the letter 'C'?

```
if (x <= 200)
    if (x < 100)
        if (x <= 0)
            printf("A\n");
        else
            printf("B\n");
    else
        printf("C\n");
else
    printf("D\n");
```

a. 0 < x < 100
b. x <= 0
c. 100 <= x <= 200
d. x > 200
e. 100 < x <= 200

4. The effect of the following program segment can best be described as _____.

```
if (x > y)
    z = x;
if (x == y)
    z = 0;
```

```
if (x < y)
    z = y;
```

a. The smaller of x and y is stored in z.
b. The larger of x and y is stored in z.
c. The larger of x and y is stored in z unless x and y are equal, in which case z is assigned zero.
d. The larger of x and y is stored in z unless x and y are not equal, in which case z is assigned zero.
e. none of the above

5. Which of the following is **true** about using relational operators in a *switch* statement?

a. >,>=,<,<=,==
b. >,>=,<,<=,=
c. >,<,==
d. relational operator can't be used in a *switch* statement

6. If the input to the program segment at the right is 85, what is its output?

a. A
b. B
c. C
d. D
e. C
   B

```
scanf("%d", &s);
if (s >= 90)
    printf("A\n");
else if (s >= 70)
    printf("C\n");
else if (s >= 80)
    printf("B\n");
else
    printf("D\n");
```

7. The if statement

```
if (13 < 12)
    printf("never\n");
else
    printf("always\n");
```

a. displays never.
b. displays always.
c. will not compile since 13 is not less than 12.
d. causes a run-time error since 13 is not less than 12.
e. displays nothing since 13 is not less that 12.

8. What will be the value of i after the C statements at the right have been executed?

a. 5
b. 6
c. 8
d. 10
e. 15

```
i = 3;
j = 10;
if ((3 * i) < j)
    i = i + 2;
i = i + 3;
```

9. What is displayed by the C statements at the right if the value input is 3?

a. Equal
b. Less
c. Greater
d. no output

```
scanf("%d", &n);
if (n = 5)
printf("Equal\n");
else if (n < 5)
    printf("Less\n");
else
    printf("Greater\n");
```

10. What is displayed by the C statements that follow if the value input is 2?

```
scanf("%d", &ctl);
switch (ctl) {
case 0:
case 1:
    printf("red ");
case 2:
    printf("blue ");
case 3:
    printf("green ");
case 4:
    printf("yellow");
}
printf("\n");
```

a. red
b. blue
c. green
d. yellow
e. blue green yellow

11. What is the complement of the following expression?

```
n || a <= b && c != 100
```

a. `!n || a > b || c == 100`
b. `!(n && (a > b || c == 100))`
c. `!n && (a > b || c == 100)`
d. `!(n || (a > b || c == 100))`
e. none of the above

Questions 12 and 13 concern the following program fragment:

```
char r, x, y, z, w;

scanf("%c%c%c%c", &x, &y, &z, &w);
if (x < y)
    r = x;
else
    r = y;
if (r > z)
    r = z;
if (r > w)
    r = w;
printf("%c\n", r);
```

12. What is the program output if the user types “runt” followed by a carriage return when the program is run?

a. r
b. u
c. n
d. t
e. none of the above

13. The program's effect can best be described as _____.

a. It displays the letter 'r' after comparing it to x, y, and z.
b. Of the four input characters, it displays the one that comes first in the alphabet.
c. Of the four input characters, it displays the one that comes last in the alphabet.
d. Of the four input characters, it displays the one that comes second in the alphabet.
e. It displays nothing since characters cannot be compared.

14. The output of executing the following statements is:

```
int x=0;
If (x < 40000000)
        printf("x is too large number");
Else
        printf("x is integer number");
```

a. "x is too large number"
b. "x is integer number"
c. These statements will not be executed
d. These statements will trigger Exception

15. C's if statement executes the statement inside its body if a specified _____is _____.
a. condition, false
b. equality operator, true
c. condition, true
d. relational operator, true

16. The If structure is an example of a:
a. Selection structure
b. Logical structure
c. Sequence structure
d. Repetition structure

17. The following two blocks of code

```
1.    int x=0;
      if (x > 2)
            x = x + 1;
      else
            x = x - 1;
2.    int x=0;
      if (x > 2)
            x = x + 1;
      else if (x < 2)
            x = x - 1;
```

a. The first block is more general than the second one (in terms of number of dealt cases)
b. The second block is more general than the first one (in terms of number of dealt cases)
c. Have no difference
d. Both are incorrect

Short Answer

1. The following code segment is syntactically correct, but difficult to read. Rewrite the segment using indentation that improves its readability.

```
if (road_stat == 's')
if (temp > 0)
printf("Roads wet.\n");
else
printf("Roads icy.\n");
else
printf("Roads dry.\n");
```

2. Rewrite the following if statement as an equivalent switch statement. The variable digit is of type int.

```
if (digit == 0)
    value = 3;
else if (digit == 1)
    value = 3;
else if (digit == 2)
    value = 6;

else if (digit == 3)
    value = 9;
```

3. The decision table below shows fines imposed for speeding violations. Write a code segment that assigns the correct fine to type double variable fine based on the value of type int variable speed.

```
Speed (mph)  Fine ($)
65 or less     0
66-70         15.00
71-75         30.00
76-80         75.00
over 80 100.00
```

4. Assume that the following code segment is correct, except for some missing punctuation marks such as parentheses, semicolons, and brackets. Add the necessary punctuation to correct the code in such a way that the indentation does not need to be changed for readability.

```
if a > b
    x = x + 10
    printf("%lf\n", x)
else
    printf("%lf\n", y)
    printf("%lf\n", z)
```

5. Rewrite the if statement below using only the relational operator < in all conditions. Assume that the value of score is between 0 and 100 inclusive.

```
if (score >= 90)
    printf("A\n");
else if (score >= 80)
    printf("B\n");
else
    printf("C\n");
```

6. Rewrite the switch statement below as a multiple-alternative if statement.

```
switch (jersey) {
case 11:
    printf("I. Thomas\n");
    break;

case 23:
    printf("M. Jordan\n");
    break;

case 33:
    printf("S. Pippen\n");
    break;

default:
    printf("Player unknown\n");
}
```

7. Evaluate the expression below assuming a is 5, flag is 1, and c is 15. What part of the expression is not computed at all because of short-circuit evaluation?

```
a != 3 && flag || c >= 10
```

8. The following code segment displays ----------.

```
v1 = 15.0;
v2 = 0.5;

if (v1 > 10.0)
    printf("ten ");
else if (v1 > 14.0)
    printf("fourteen ");
if (v2 * v1 > 7.0)
    printf("seven ");
if (v1 - v2 > 9.0)
    printf("nine ");
printf("\n");
```

9. Complete the program below so that it displays the value of n and the message " is positive." if n is positive. If n is negative, the program should display the value of n and the message " is negative." If n is zero, the program should produce no output at all.

```
#include <stdio.h>

int
int main()
{
    double n;

    printf("Enter a number> ");
    scanf("%lf", &n);
```

10. Complete the program below so that it computes the price of a piece of glass. Pieces of glass are usually priced based on the type of glass and the area of the piece, but there is a minimum charge of $2.00. For clear glass (glass type 1), the charge is $6.00 per square meter; for frosted glass (type 2), the price is $10.00 per square meter. For example, the cost of a 0.25-square-meter piece of clear glass is $2.00 since 0.25 * $6.00 is $1.50, an amount less than the minimum charge. The price of a 2.4-square-meter piece of frosted glass is $24.00 (2.4 * $10.00). You do not need to do error checking in the program.

```
#include <stdio.h>

#define CLEAR            1
#define SQMETER_CLEAR    6.00

#define FROSTED          2
#define SQMETER_FROSTED 10.00

#define MINIMUM          2.00

int main()
{
    double price, area;
    int    type;


    printf("Enter glass type: %d (clear) or %d (frosted)> ",
           CLEAR, FROSTED);
    scanf("%d", &type);
    printf("Enter area in square meters> "):
    scanf("%lf", &area);
```

11. Answer the questions below concerning the following fragment of code.

```
#include "stdio.h"
int main()
{
int n;
printf( "Enter an integer:\n");
scanf("%d",&n);
if (n < 10)
printf( "less than 10:\n");

else if (n > 5)
printf(  "greater than 5\n");
else
printf("not interesting");
return 0;}
```

a. What will be the output of the fragment above if the interactive user enters the integer value 0?

b. What will be the output of the fragment above if the interactive user enters the integer value 15?

c. What will be the output of the fragment above if the interactive user enters the integer value 7?

e. What values for `n` will cause the output of the fragment above to be "`not interesting`"?

12. Remove all the unnecessary tests from the nested conditional statement below.

```
#include "stdafx.h"
int main()
{float income;
printf("Enter your monthly income: \n");
scanf("%f",&income);
 if (income < 0.0)
      printf("You are going farther into debt every
month.\n");
 else if (income >= 0.0 && income < 1200.00)
      printf("You are living below the poverty line.\n");
 else if (income >= 1200.00 && income < 2500.00)
```

```
            printf("You are living in moderate comfort.\n");
        else if (income >= 2500.00)
            printf("You are well off.\n" );
        return 0;}
```

13. Rewrite the following code segments:

`int i;`
`scanf("%d",&i);`
`if(i == 1)`
`printf("*");`
`else if (i == 2)`
`printf("**");`
`else`
`printf("Out of range");`
	Switch Statement

`int a,b ;`
`char op;`
`printf ("Enter two numbers\n");`
`scanf("%d %d",&a,&b);`
`printf ("Enter Operator\n");`
`scanf("%c ",&op);`
`switch (op)`
`{`
`Case '+':`
`printf ("%d", a + b);`
`Case '*':`
`printf ("%d", a * b);`
`Case '-'`
`printf ("%d", a - b);`
`Case '/':`
`printf ("%f", float(a) / b);`
`Default:`
`printf ("there is no oparetor");`
`}`
	If Statement

14. In the code fragment below, the programmer has almost certainly made an error in the first line of the conditional statement.

a. What is the output of this code fragment as it is written?

b. How can it be corrected to do what is the programmer surely intended?

```
#include "stdafx.h"
int main()
{
int n = 5;
if (n = 0) // NOTE THE OPERATOR!!!
  printf("n is zero.\n" );
else
  printf("n is not zero.\n");
printf( "The square of n is %d\n. " ,n * n );

return 0;
}
```

15. The nested conditional statement shown below has been written by an inexperienced C programmer.

The behavior of the statement is not correctly represented by the formatting.

```
#include "stdafx.h"
int main()
{int n;
     printf("Enter the Number\n");
     scanf("%d",&n);
     if (n < 10)
          if (n > 0)
               printf("The number is positive.");
          else
               printf("The number is _____________.");

     return 0;
}
```

a. What is the output of the statement if the variable `n` has the value 7 ? If `n` has the value 15 ? If `n` has the value –3 ?

b. Correct the syntax of the statement so that the *logic* of the corrected statement corresponds to the *formatting* of the original statement. Also, replace the blank with an appropriate word or phrase.

c. Correct the formatting of the (original) statement so that the new format reflects the logical behavior of the original statement. Also, replace the blank with an appropriate word or phrase.

16. write a pseudocode then Write a C program that: accept 3 numbers and print the middle

17. Write the code using C language for the following Pseudocode

PROMPT for First Number
READ FirstNumber
PROMPT for Second Number
READ SecondNumber
IF SecondNumber is greater than FirstNumber
THEN CALCULATE Result = SecondNumber - FirstNumber
ELSE CALCULATE Result = firstNumber - SecondNumber
DISPLAY Result

18. Write a program that:

a. Prompt the user to enter his Grade as letter (1 or 2 or 3 or 4 or 5)
b. Case Grade:
   1 : print (you deserve Trip to Europe)
   2 : print (you deserve Trip to Lattakia)
   3 : print (you deserve Music CD)
   4 : print (you deserve nothing)
   5 : print (You are in TROUBLE)
   Otherwise: print (You did not enter a valid Grade)

Note: consider the capital letter and small letter

Draw a float chart then write a C program that accept integer number and display the state of number (odd or even)

19. Write a program that:

1- Prompt user to enter his Full Name
2- Ask user to enter his birth date (day, month)
3- Find the appropriate horoscope depending on day and month using (switch, if-else statements)
4- Print the following message:
   (hello ***Full Name*** your horoscope is: ***horoscope Name***)

Student Declaration: I certify that the work contained in this assignment was researched and prepared by me:

Signature: _____ **Date:** / /

Remark: separate feedback sheet will be returned to you after your work has been marked

Feedback Sheet

Student's Notes:
Assistant's Feed Back:

Assistant: _____

Signature: _____ Date: _____