WEEK-END ASSIGNMENT-02

Operating Systems Workshop (CSE 3541)

Problem Statement:

Experiment with selection structures; if, if-else, if-else if-else and switch statements to develop applications.

Assignment Objectives:

To become familiar with one of the control structures, selection, out of sequence, selection, and repetition kinds of control structure.

Instruction to Students (If any):

Students are required to write his/her own program by avoiding any kind of copy from any sources. Additionally, They must be able to realise the outcome of that question in relevant to systems programming. You may use additional pages on requirement.

Programming/ Output Based Questions:

1. Find the value that is assigned to x when y is 10.0.

   Code snippet: 1(a)

   ```
   x = 25.0;
   if(y != (x - 10.0))
       x = x - 10.0;
   else
       x = x / 2.0;
   ```

   Output

   Code snippet: 1(b)

   ```
   if(y < 15.0)
      if(y >= 0.0)
         x = 5 * y;
      else
         x = 2 * y;
   else
      x = 3 * y;
   ```

   Output

   Code snippet: 1(c)

   ```
   if (y < 15.0 && y >= 0.0)
      x = 5 * y;
   else
      x = 2 * y;
   ```

   Output

2. Write C statements to carry out the following.

Output

If item is nonzero, then multiply product by item and save the result in product ; otherwise, skip the multiplication. In either case, print the value of product. Declare the appropriate type and initialize, if required.

3. Correct the following if statement; assume the indentation is correct.
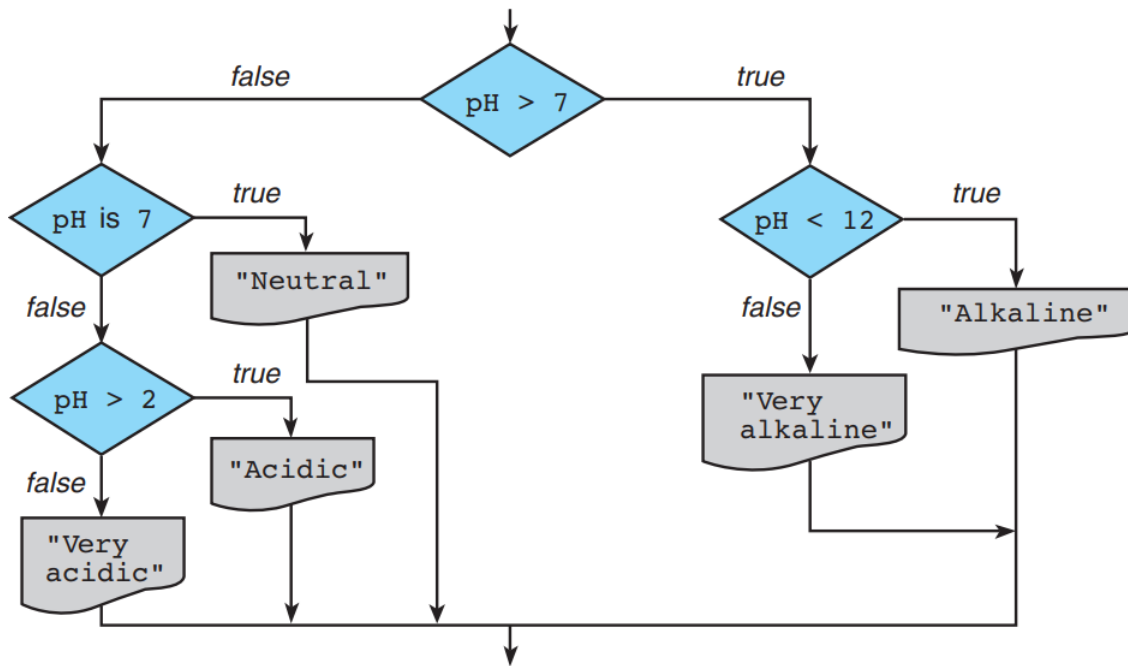
Output

```
if (deduct < balance);
    balance = balance - deduct;
    printf("New balance is %.2f\n", balance);
 else;
    printf("Deduction of %.2f refused.\n",
        deduct);
    printf("Would overdraw account.\n");

printf("Deduction = %.2f Final balance = %.2f",
 deduct, balance);
```

4. Write an interactive program that contains an if statement that may be used to compute the area of a square ($area = side^2$) or a circle ($area = pi \times radius^2$) after prompting the user to type the first character of the figure name (S or C).

Write/paste your code here ▼

5. Write a nested if statement for the decision diagrammed in the accompanying flowchart. Use a multiple-alternative if for intermediate decisions where possible.

Space for Program and output ▼

6. Implement the following decision table using a **nested if** statement. Assume that the grade point average is within the range 0.0 through 4.0.

Grade Point Average	Transcript Message
0.00.99	Failed semesterregistration suspended
1.01.99	On probation for next semester
2.02.99	(no message)
3.03.49	Deans list for semester
3.54.00	Highest honors for semester

Space for Program and output ▼

7. Implement the following decision table using a **multiple-alternative if** statement. Assume that the wind speed is given as an integer.

Wind Speed (mph)	Category
below 25	not a strong wind
25–38	strong wind
39–54	gale
55–72	whole gale
above 72	hurricane

Space for Program and output ▼

8. What will be printed by this carelessly constructed switch statement if the value of **color** is **'R'**?

```
switch (color) { /* break statements missing */
case 'R':
    printf("red\n");
case 'B':
    printf("blue\n");
case 'Y':
  printf("yellow\n");
}
```

Output

9. Determine life expectancy of a standard light bulb given the input watts; 35, 45, 76, 120 respectively.

```
switch (watts) {
 case 25:
    life = 2500;
    break;
 case 40:
 case 60:
    life = 1000;
    break;
 case 75:
 case 100:
    life = 750;
    break;
 default:
    life = 0;
}
```

Output

10. C relational and equality operators give a result of 1 for true and 0 for false. Evaluate the following expression for different values of **x**. Also write the statement to avoid such common error.

```
if (0 <= x <= 4)
    printf("Condition is true\n");
```

Common Error Correction

Test cases and output ▼

```
(a)  x=5
(b)  x=15
(c)  x=34
(d)  x=-20
(e)  x=-45
```

11. Evaluate the following code snippet for different values of **x**.

```
printf("Enter x \n");
scanf("%d",&x);
if (x = 10)
 printf("x is 10");
 printf("Differentiate: == and =");
else
 printf(" simply incorrect results");
```

Common Error correction in if statement

Test cases and output ▼

```
(a)  x=5
(b)  x=15
(c)  x=34
(d)  x=-20
(e)  x=-45
```

12. Write a switch statement that assigns to the variable lumens the expected brightness of a standard light bulb whose wattage has been stored in watts. Assign 1 to **lumens** if the value of **watts** is not in the table.Use this table:

Watts	Brightness (in Lumens)
15	125
25	215
40	500
60	880
75	1000
100	1675

Space for Program and output ▼

13. Keiths Sheet Music needs a program to implement its music teachers discount policy. The program is to prompt the user to enter the purchase total and to indicate whether the purchaser is a teacher. The store plans to give each customer a printed receipt, so your program is to create a nicely formatted file called **receipt.txt**. Music teachers receive a 10% discount on their sheet music purchases unless the purchase total is $100 or higher. In that case, the discount is 12%. The discount calculation occurs before addition of the 5% sales tax. Here are two sample output filesone for a teacher and one for a nonteacher.

```
Total purchases              $122.00
Teacher's discount (12%)       14.64
Discounted total              107.36
Sales tax (5%)                  5.37
Total                        $112.73
Total purchases               $24.90
Sales tax (5%)                  1.25
Total                        $26.15
```

Note: to display a % sign, place two % signs in the format string:

```
printf("%d%%", SALES_TAX);
```

To write the output in the file **receipt.txt** use output redirection, **./a.out** > **receipt.txt**

Space for Program and output ▼

Space for Program and output ▼

14. A particular cell phone plan includes 50 minutes of air time and 50 text messages for $15.00 a month. Each additional minute of air time costs $0.25, while additional text messages cost $0.15 each. All cell phone bills include an additional charge of $0.44 to support 911 call centers, and the entire bill (including the 911 charge) is subject to 5 percent sales tax.

Write a program that reads the number of minutes and text messages used in a month from the user. Display the base charge, additional minutes charge (if any), additional text message charge (if any), the 911 fee, tax and total bill amount. Only display the additional minute and text message charges if the user incurred costs in these categories. Ensure that all of the charges are displayed using 2 decimal places.

Space for Program and output ▼

Space for Program and output ▼

15. Write a program that determines the day number (1 to 366) in a year for a date that is provided as input data. As an example, January 1, 1994, is day 1. December 31, 1993, is day 365. December 31, 1996, is day 366, since 1996 is a leap year. A year is a leap year if it is divisible by four, except that any year divisible by 100 is a leap year only if it is divisible by 400. Your program should accept the month, day, and year as integers. Include a function leap that returns 1 if called with a leap year, 0 otherwise.

Space for Program and output ▼

Space for Program and output ▼

16. A triangle can be classified based on the lengths of its sides as equilateral, isosceles or scalene. All three sides of an equilateral triangle have the same length. An isosceles triangle has two sides that are the same length, and a third side that is a different length. If all of the sides have different lengths then the triangle is scalene. Write a program that reads the lengths of the three sides of a triangle from the user. Then display a message that states the triangles type.

Space for Program and output ▼