



Course Title:	Programming Fundamentals Lab (CL1002)
Assignment Title:	Lab Task (Manual 04)
Submitted to:	Sir Sandesh Kumar
Name:	Muhammad Usman Khan
Roll No:	25K-2038 BCY-1A
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LAB TASKS [14 Marks]

Scenario: Due to water shortages in many cities, a smart system is being designed to monitor and manage water consumption in homes. The system should:

- Track water usage.
 - Identify wastage.
 - Apply penalties or bonuses.
 - Help families save water.
1. Write a C program to ask the user to enter daily water usage in liters. If usage is less than or equal to 100 litres, print "**Efficient Usage**". Otherwise, print "**High Usage Detected**".
 2. Write a C program to ask the user to enter monthly water usage (liters). If usage ≤ 3000 liters, print "Bill = 500 PKR", else print "Bill = 1000 PKR".
 3. Write a C program to calculate fine based on monthly usage of water.
 - ≤ 3000 liters \rightarrow "No Fine".
 - 3001 – 5000 liters \rightarrow "Fine = 200 PKR".
 - 5001 – 7000 liters \rightarrow "Fine = 500 PKR".
 - 7000 liters \rightarrow "Fine = 1000 PKR + Water Supply Restricted"
 4. Write a C program to classify the category of user using a category code (1-4):
 - 1 \rightarrow "Low Usage Household"
 - 2 \rightarrow "Average Household"
 - 3 \rightarrow "High Usage Household"
 - 4 \rightarrow "Excessive Usage Household"
 - Default \rightarrow "Invalid Category Code"
 5. Write a C program to ask the user the number of family members and monthly usage of water in liters. If usage > 3000 liters, then check members and if members > 6 then print "**Allowed: Large Family Exception**" else print "**Fine Applied**".
 6. Write a C program to ask the user for monthly usage of water in liters and number of days water was saved (i.e. usage < 80 liters/day). If usage < 2500 liters AND saved days > 10 then print "**Bonus: 300 PKR Discount**" else print "**No Bonus**".
 7. Write a C program to ask the user's monthly usage of water in liters, family size, and category code (1-4) and output the following.
 - Show category name
 - Calculate bill
 - Apply fine
 - Apply bonus if eligible

Question 1

```

1 #include<stdio.h>
2 int main(){
3     int litres;
4     printf("Enter daily water usage in litres: ");
5     scanf("%d", &litres);
6     if (litres<=100)
7         printf("Efficient Usage");
8     else
9         printf("High Usage Detected");
10    return 0;
11 }

```

C:\Users\usman\OneDrive\Documents\PF LAB\q2\1.exe

```

Enter daily water usage in litres: 120
High Usage Detected

Process exited after 10.86 seconds with return value 0
Press any key to continue . . .

```

Question 2

```

1 #include<stdio.h>
2 int main(){
3     int litres;
4     printf("Enter monthly water usage in litres: ");
5     scanf("%d", &litres);
6     if (litres<=3000)
7         printf("Bill = 500 PKR");
8     else
9         printf("Bill = 1000 PKR");
10    return 0;
11 }

```

C:\Users\usman\OneDrive\Documents\PF LAB\q2\2.exe

```

Enter monthly water usage in litres: 3200
Bill = 1000 PKR

Process exited after 15.67 seconds with return value 0
Press any key to continue . . .

```

Question 3

```

1 #include<stdio.h>
2 int main(){
3     int litres;
4     printf("Enter monthly water usage in litres: ");
5     scanf("%d", &litres);
6     if (litres<=3000){
7         printf("No Fine");
8     } else if (litres<=5000){
9         printf("Fine = 200 PKR");
10    } else if (litres<=7000){
11        printf("Fine = 500 PKR");
12    } else {
13        printf("Fine = 1000 PKR,\nWater Supply Restricted.");
14    }
15    return 0;
16 }
17
18

```

C:\Users\usman\OneDrive\Documents\PF LAB\q2\3.exe

Enter monthly water usage in litres: 6000
Fine = 500 PKR

Process exited after 2.549 seconds with return value 0
Press any key to continue . . .

Question 4

```

1 #include<stdio.h>
2 int main(){
3     int code;
4     printf("Enter your category code: ");
5     scanf("%d", &code);
6     switch(code){
7         case 1:
8             printf("Low Usage Household.");
9             break;
10        case 2:
11            printf("Average Usage Household.");
12            break;
13        case 3:
14            printf("High Usage Household.");
15            break;
16        case 4:
17            printf("Excessive Usage Household.");
18            break;
19        default:
20            printf("Invalid category code.");
21    }
22    return 0;
23 }

```

C:\Users\usman\OneDrive\Documents\PF LAB\

Enter your category code: 1
Low Usage Household.

Question 5

```

1 #include <stdio.h>
2 int main() {
3     int members, litres;
4     printf("Enter number of family members: ");
5     scanf("%d", &members);
6     printf("Enter monthly water usage in litres: ");
7     scanf("%d", &litres);
8     if (litres > 3000) {
9         if (members > 6) {
10            printf("Allowed: Large Family Exception");
11        } else {
12            printf("Fine Applied.");
13        }
14    } else {
15        printf("No Fine Applied.");
16    }
17    return 0;
18 }
19

```

 C:\Users\usman\OneDrive\Documents\PF LAB\q2\5.exe
 Enter number of family members: 7
 Enter monthly water usage in litres: 2800
 No Fine Applied.

Question 6

```

1 #include <stdio.h>
2
3 int main() {
4     int litres, days, usage;
5     printf("Enter monthly water usage in litres: ");
6     scanf("%d", &litres);
7     printf("Enter number of days water was saved: ");
8     scanf("%d", &days);
9     if (litres < 2500 && days > 10){
10        printf("Bonus: 300 PKR Discount.");
11    } else {
12        printf("No Bonus.");
13    }
14    return 0;
15 }
16

```

 C:\Users\usman\OneDrive\Documents\PF LAB\q2\6.exe
 Enter monthly water usage in litres: 2300
 Enter number of days water was saved: 12
 Bonus: 300 PKR Discount.

 Process exited after 3.965 seconds with return value 0
 Press any key to continue . . .

Question 7

```
1 #include<stdio.h>
2 int main(){
3     int code;
4     int litres;
5     int members;
6     int days;
7     int bill;
8     int fine;
9     int bonus;
10    int total_bill;
11    printf("Enter monthly water usage in litres: ");
12    scanf("%d", &litres);
13    printf("Enter number of days water was saved: ");
14    scanf("%d", &days);
15    printf("Enter number of family members: ");
16    scanf("%d", &members);
17    printf("Enter your category code: ");
18    scanf("%d", &code);
19
20    if (litres<=3000){
21        fine=0;
22    } else if (litres<=5000){
23        fine=200;
24    } else if (litres<=7000){
25        fine=500;
26    } else {
27        fine=1000;
28    }
29
30    if (litres < 2500 && days > 10){
31        bonus=300;
32    } else {
33        bonus=0;
34    }
35
36    if (litres<=3000){
37        bill = 500;
38    } else {
39        bill = 1000;
40    }
41
42    total_bill = bill+fine-bonus;
43    |
44    switch(code){
45        case 1:
46            printf("Low Usage Household.\n");
47            break;
48        case 2:
49            printf("Average Usage Household.\n");
50            break;
51        case 3:
```

```
52     printf("High Usage Household.\n");
53     break;
54   case 4:
55     printf("Excessive Usage Household.\n");
56     break;
57   default:
58     printf("Invalid category code.\n");
59   }
60
61   printf("Your base bill is: %d\n",bill);
62   printf("Fine Applied: %d\n", fine);
63   printf("Bonus Applied: %d\n", bonus);
64   printf("Your total bill is: %d\n", total_bill);
65
66   return 0;
67 }
```

C:\Users\usman\OneDrive\Documents\PF LAB\q2\7.exe

```
Enter monthly water usage in litres: 3000
Enter number of days water was saved: 12
Enter number of family members: 7
Enter your category code: 2
Average Usage Household.
Your base bill is: 500
Fine Applied: 0
Bonus Applied: 0
Your total bill is: 500
```

Compile Log Compilation result

- Errors: 0
- Warnings: 0
- Output Filename:
- Output Size: 129