

Course Title:	Programming Fundamentals Lab (CL1002)
Assignment Title:	Lab Task (Manual 04)
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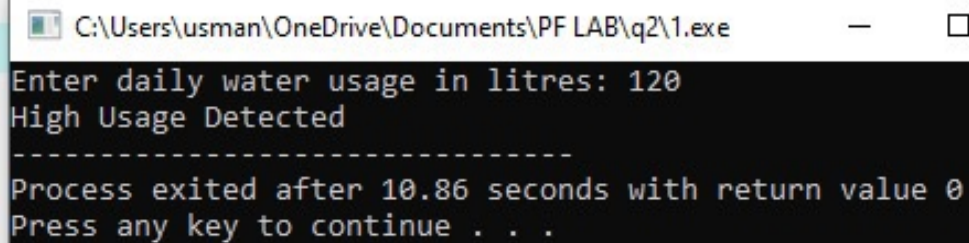
LAB TASKS [14 Marks]

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 }
12
```



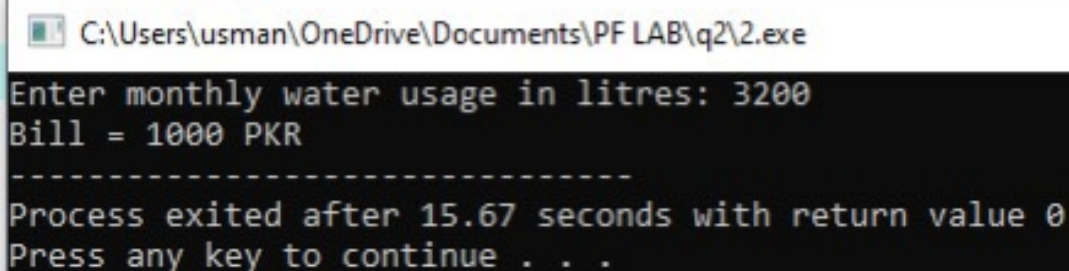
C:\Users\usman\OneDrive\Documents\PF LAB\q2\1.exe

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 }
12
```



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

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

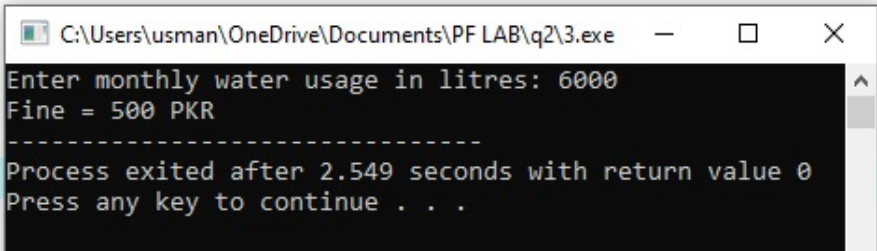
Process exited after 15.67 seconds with return value 0
Press any key to continue . . .

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

```



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

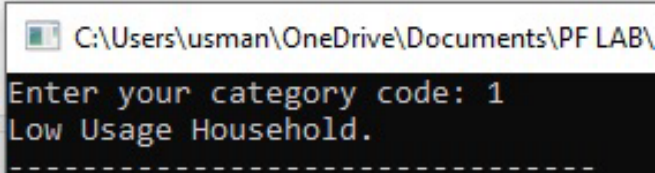
Process exited after 2.549 seconds with return value 0
Press any key to continue . . .

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 }

```



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 }
```

 Compile Log 

Compilation result

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

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
```