EXPERIMENT 2

Aim :

Write a program to reverse a linked list using iterative and recursive method.

Code :

```c
#include <stdio.h>
#include <stdlib.h>

typedef struct node
{
    int i;
    struct node *next;
} node1;

void reverselinkedlist(node1 *head)
{
    if (head->next == NULL)
    {
        printf("%d->", head->i);
    }
    else
    {
        reverselinkedlist(head->next);
        printf("%d->", head->i);
    }
}

int main()
{
    char hh;
    do
    {   char ch;
        node1 *head = NULL, *tail = NULL;
        do
        {
    printf("\n Program to reverse a linked list (Iterative & Recursive)");
            printf("\n Creating linked list...");
            printf("\n Enter an integer : ");
            if (head == NULL)
            {
                head = malloc(sizeof(node1));
                scanf("%d", &head->i);
                head->next = NULL;
                tail = head;
            }
```

```c
        else
        {
            node1 *n1 = malloc(sizeof(node1));
            scanf("%d", &n1->i);
            n1->next = NULL;
            tail->next = n1;
            tail = n1;
        }
        printf(" Linked list is : ");
        node1 *n2 = head;
        printf(" ");
        while (n2 != NULL)
        {
            printf("%d->", n2->i);
            n2 = n2->next;
        }
        printf("null");
        printf("\n Do you want to enter more elements ? (y/n) : ");
        fflush(stdin);
        scanf("%c", &ch);
    } while (ch == 'y' || ch == 'Y');

    char ch1;
    do
    {   int choice;
        printf(" Entered Linked List is : ");
        node1 *n2 = head;
        printf(" ");
        while (n2 != NULL)
        {
            printf("%d->", n2->i);
            n2 = n2->next;
        }
        printf("null");
        printf("\n 1. Reverse the linked list Iteratively");
        printf("\n 2. Reverse the linked list Recursively");
        printf("\n Enter your choice : ");
        scanf("%d", &choice);
        switch (choice)
        {

        case 1:
            printf("");
            node1 *n2 = head;
            node1 *c, *chead = NULL;
```

```c
            while (n2 != NULL)
            {
                c = malloc(sizeof(node1));
                c->i = n2->i;
                if (chead == NULL)
                {
                    c->next = NULL;
                    chead = c;
                }
                else
                {
                    c->next = chead;
                    chead = c;
                }
                n2 = n2->next;
            }
            node1 *x = chead;
            printf("\n Reversed linked list is (Iteratively) : ");
            while (x != NULL)
            {
                printf("%d->", x->i);
                x = x->next;
            }
            printf("null");
            break;

        case 2:
            printf("\n Reversed linked list is (Recursively) : ");
            reverselinkedlist(head);
            printf("null");
            break;

        default:
            printf(" Wrong choice!");
            break;
        }
  printf("\n Do you want to reverse using a different choice ? (y/n) : ");
            fflush(stdin);
            scanf("%c", &ch1);
        } while ((ch1 == 'Y') || (ch1 == 'y'));

        printf("\n Do you want to run this program again ? (y/n) : ");
        fflush(stdin);
        scanf("%c", &hh);
    } while ((hh == 'y') || (hh == 'Y'));

    return 0;
}
```
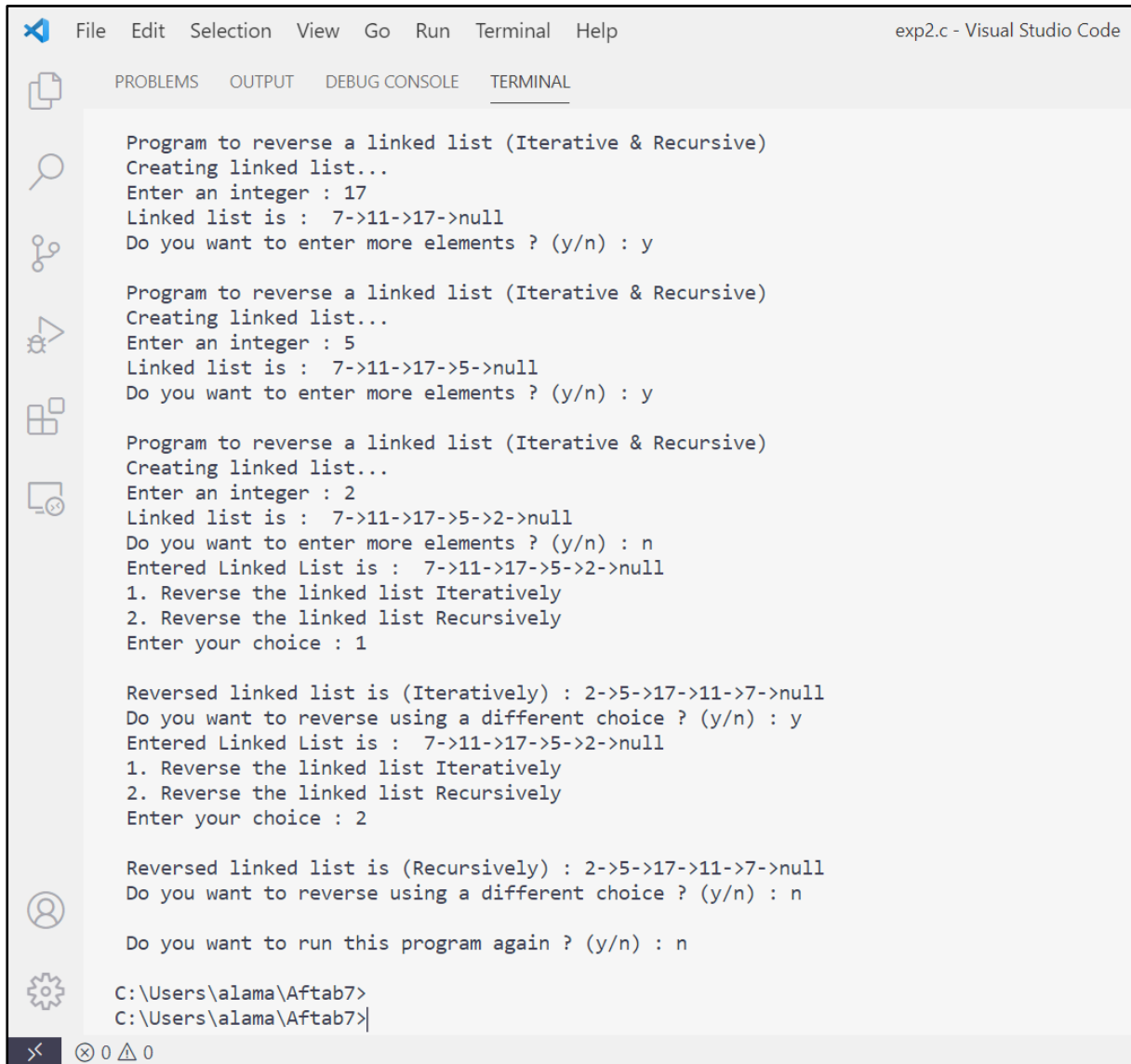
Output Screenshot :

File   Edit   Selection   View   Go   Run   Terminal   Help   exp2.c - Visual Studio Code

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL

```
Program to reverse a linked list (Iterative & Recursive)
Creating linked list...
Enter an integer : 17
Linked list is :  7->11->17->null
Do you want to enter more elements ? (y/n) : y

Program to reverse a linked list (Iterative & Recursive)
Creating linked list...
Enter an integer : 5
Linked list is :  7->11->17->5->null
Do you want to enter more elements ? (y/n) : y

Program to reverse a linked list (Iterative & Recursive)
Creating linked list...
Enter an integer : 2
Linked list is :  7->11->17->5->2->null
Do you want to enter more elements ? (y/n) : n
Entered Linked List is :  7->11->17->5->2->null
1. Reverse the linked list Iteratively
2. Reverse the linked list Recursively
Enter your choice : 1

Reversed linked list is (Iteratively) : 2->5->17->11->7->null
Do you want to reverse using a different choice ? (y/n) : y
Entered Linked List is :  7->11->17->5->2->null
1. Reverse the linked list Iteratively
2. Reverse the linked list Recursively
Enter your choice : 2

Reversed linked list is (Recursively) : 2->5->17->11->7->null
Do you want to reverse using a different choice ? (y/n) : n

Do you want to run this program again ? (y/n) : n

C:\Users\alama\Aftab7>
C:\Users\alama\Aftab7>
```

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