Write a program to implement singly linked list with the following operations:

a. Create a linked list

b. Insertion a node at first position at any position and at end of the list.

Display the contents of linked list.

```
#include <stdio.h>

#include <stdlib.h>


struct node {

  int info;

  struct node *next;

};


struct node *createlk() {

  struct node *p;

  struct node *start = NULL;

  int item;

  printf("Enter -999 to exit\n");

  scanf("%d", &item);

  while (item != -999) {

    p = (struct node *)malloc(sizeof(struct node));

    p->info = item;

    p->next = start;

    start = p;

    scanf("%d", &item);

  }

  return start;

}


struct node *insertfirst(struct node *start, int item) {

  struct node *p = (struct node *)malloc(sizeof(struct node));

  p->info = item;
```

```
    p->next = start;
    return p;
}

struct node *insertatlast(struct node *start, int item) {
    struct node *p = (struct node *)malloc(sizeof(struct node));
    struct node *temp;
    p->info = item;
    p->next = NULL;

    if (start == NULL)
        return p;

    temp = start;
    while (temp->next != NULL)
        temp = temp->next;

    temp->next = p;
    return start;
}

struct node *insertatposition(struct node *start, int index, int item) {
    struct node *p = (struct node *)malloc(sizeof(struct node));
    struct node *temp = start;
    int i = 0;

    p->info = item;

    if (index == 0) {
        p->next = start;
        return p;
    }

    while (i < index - 1 && temp != NULL) {
        temp = temp->next;
        i++;
    }

    if (temp == NULL) {
        printf("Invalid index\n");
        free(p);
        return start;
    }

    p->next = temp->next;
    temp->next = p;
    return start;
}

void display(struct node *start) {
    struct node *temp;
    if (start == NULL) {
        printf("Linked list is empty\n");
        return;
    }

    temp = start;
    printf("Elements are:\n");
    while (temp != NULL) {
        printf("%d\n", temp->info);
        temp = temp->next;
    }
```

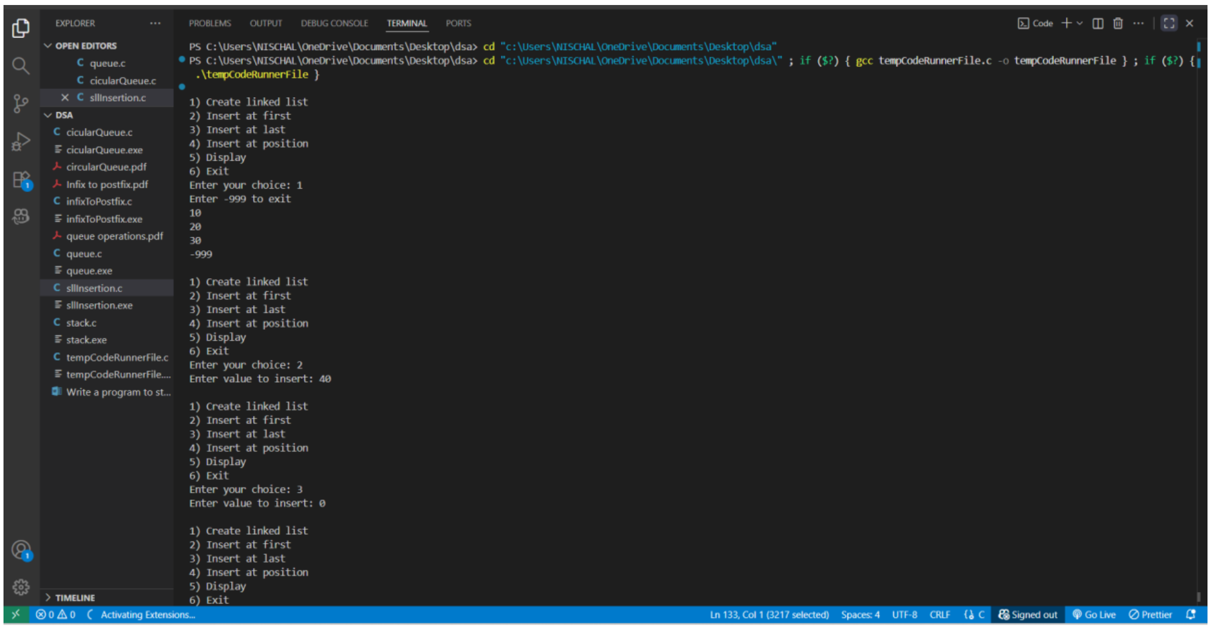
```
}

int main() {
   struct node *head = NULL;
   int choice, val, index;

   while (1) {
      printf("\n1) Create linked list\n2) Insert at first\n3) Insert at last\n4) Insert at position\n5)
Display\n6) Exit\n");
      printf("Enter your choice: ");
      scanf("%d", &choice);

      switch (choice) {
         case 1:
            head = createlk();
            break;
         case 2:
            printf("Enter value to insert: ");
            scanf("%d", &val);
            head = insertfirst(head, val);
            break;
         case 3:
            printf("Enter value to insert: ");
            scanf("%d", &val);
            head = insertatlast(head, val);
            break;
         case 4:
            printf("Enter value to insert: ");
            scanf("%d", &val);
            printf("Enter index to insert: ");
            scanf("%d", &index);
            head = insertatposition(head, index, val);
            break;
          case 5:
            display(head);
            break;
          case 6:
            printf("Exiting program.\n");
            return 0;
          default:
            printf("Invalid choice.\n");
        }
      }
    }
```

Output:



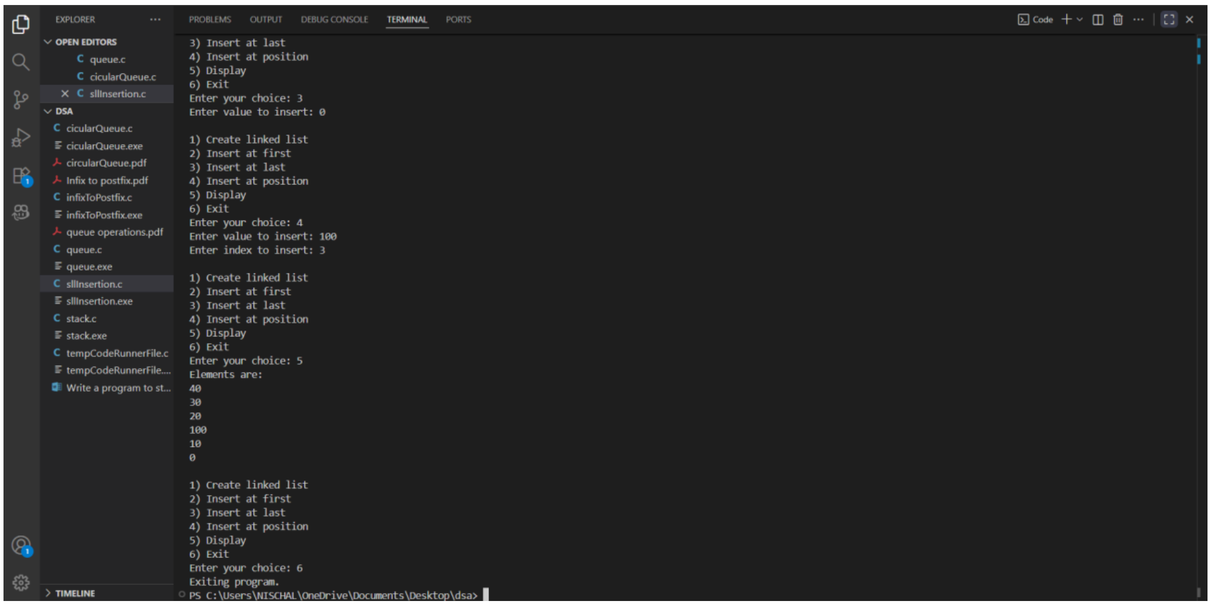
```
PS C:\Users\NISCHAL\OneDrive\Documents\Desktop\dsa> cd "c:\Users\NISCHAL\OneDrive\Documents\Desktop\dsa"
PS C:\Users\NISCHAL\OneDrive\Documents\Desktop\dsa> cd "c:\Users\NISCHAL\OneDrive\Documents\Desktop\dsa\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) {
 .\tempCodeRunnerFile }

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 1
Enter -999 to exit
10
20
30
-999

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 2
Enter value to insert: 40

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 3
Enter value to insert: 0

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
```



```
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 3
Enter value to insert: 0

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 4
Enter value to insert: 100
Enter index to insert: 3

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 5
Elements are:
40
30
20
100
10
0

1) Create linked list
2) Insert at first
3) Insert at last
4) Insert at position
5) Display
6) Exit
Enter your choice: 6
Exiting program.
PS C:\Users\NISCHAL\OneDrive\Documents\Desktop\dsa>
```