4a. WAP to Implement Singly Linked List with following operations

a) Createalinkedlist.

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

Display the contents of the linked list.

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

// Definition of node
struct node {
    int data;
    struct node *next;
};

struct node *head = NULL;

// Create linked list
void create() {
    int n, value;
    struct node *temp, *newnode;

    printf("Enter number of nodes: ");
    scanf("%d", &n);

    for (int i = 0; i < n; i++) {
        newnode = (struct node *)malloc(sizeof(struct node));
```

```
        printf("Enter data for node %d: ", i + 1);
        scanf("%d", &value);

        newnode->data = value;
        newnode->next = NULL;

        if (head == NULL) {
            head = temp = newnode;
        } else {
            temp->next = newnode;
            temp = newnode;
        }
    }
}

// Insert at beginning
void insert_begin() {
    int value;
    struct node *newnode = (struct node *)malloc(sizeof(struct node));

    printf("Enter data to insert at beginning: ");
    scanf("%d", &value);

    newnode->data = value;
    newnode->next = head;
    head = newnode;
}
```

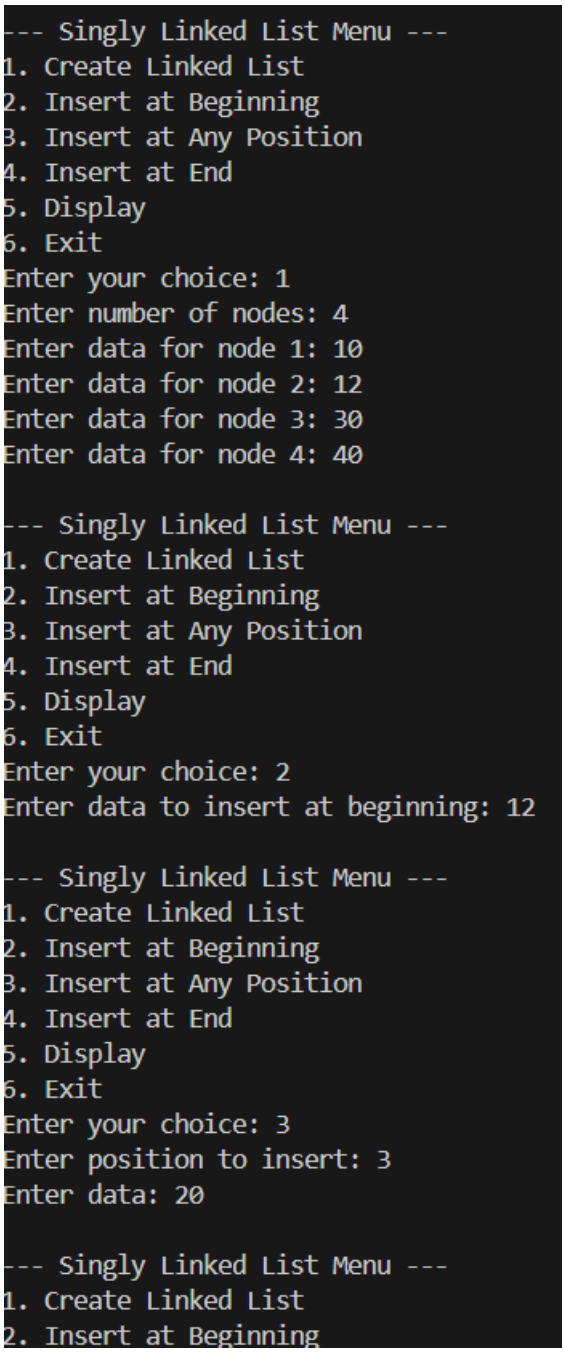
```
// Insert at any position
void insert_position() {
    int value, pos;
    struct node *temp = head;

    printf("Enter position to insert: ");
    scanf("%d", &pos);
    printf("Enter data: ");
    scanf("%d", &value);

    if (pos == 1) {
        insert_begin();
        return;
    }

    struct node *newnode = (struct node *)malloc(sizeof(struct node));
    newnode->data = value;

    for (int i = 1; i < pos - 1 && temp != NULL; i++) {
        temp = temp->next;
    }

    if (temp == NULL) {
        printf("Invalid position.\n");
        free(newnode);
        return;
    }
```

```
    newnode->next = temp->next;
    temp->next = newnode;
}

// Insert at end
void insert_end() {
    int value;
    struct node *newnode = (struct node *)malloc(sizeof(struct node));
    struct node *temp = head;

    printf("Enter data to insert at end: ");
    scanf("%d", &value);

    newnode->data = value;
    newnode->next = NULL;

    if (head == NULL) {
        head = newnode;
        return;
    }

    while (temp->next != NULL) {
        temp = temp->next;
    }
    temp->next = newnode;
}

// Display linked list
```

```
void display() {
    struct node *temp = head;

    if (head == NULL) {
        printf("Linked List is empty.\n");
        return;
    }

    printf("Linked List elements are:\n");
    while (temp != NULL) {
        printf("%d -> ", temp->data);
        temp = temp->next;
    }
    printf("NULL\n");
}

int main() {
    int choice;

    do {
        printf("\n--- Singly Linked List Menu ---\n");
        printf("1. Create Linked List\n");
        printf("2. Insert at Beginning\n");
        printf("3. Insert at Any Position\n");
        printf("4. Insert at End\n");
        printf("5. Display\n");
        printf("6. Exit\n");
        printf("Enter your choice: ");
```

```
        scanf("%d", &choice);

        switch (choice) {
            case 1:
                create();
                break;
            case 2:
                insert_begin();
                break;
            case 3:
                insert_position();
                break;
            case 4:
                insert_end();
                break;
            case 5:
                display();
                break;
            case 6:
                printf("Exiting program.\n");
                break;
            default:
                printf("Invalid choice! Try again.\n");
        }
    } while (choice != 6);

    return 0;
}
```

OUTPUT:


--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 1
Enter number of nodes: 4
Enter data for node 1: 10
Enter data for node 2: 12
Enter data for node 3: 30
Enter data for node 4: 40
--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 2
Enter data to insert at beginning: 12
--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 3
Enter position to insert: 3
Enter data: 20
--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning

```
--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 4
Enter data to insert at end: 4

--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 2
Enter data to insert at beginning: 5

--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 5
Linked List elements are:
5 -> 12 -> 10 -> 20 -> 12 -> 30 -> 40 -> 4 -> NULL

--- Singly Linked List Menu ---
1. Create Linked List
2. Insert at Beginning
3. Insert at Any Position
4. Insert at End
5. Display
6. Exit
Enter your choice: 6
Exiting program.
```