LAB 4

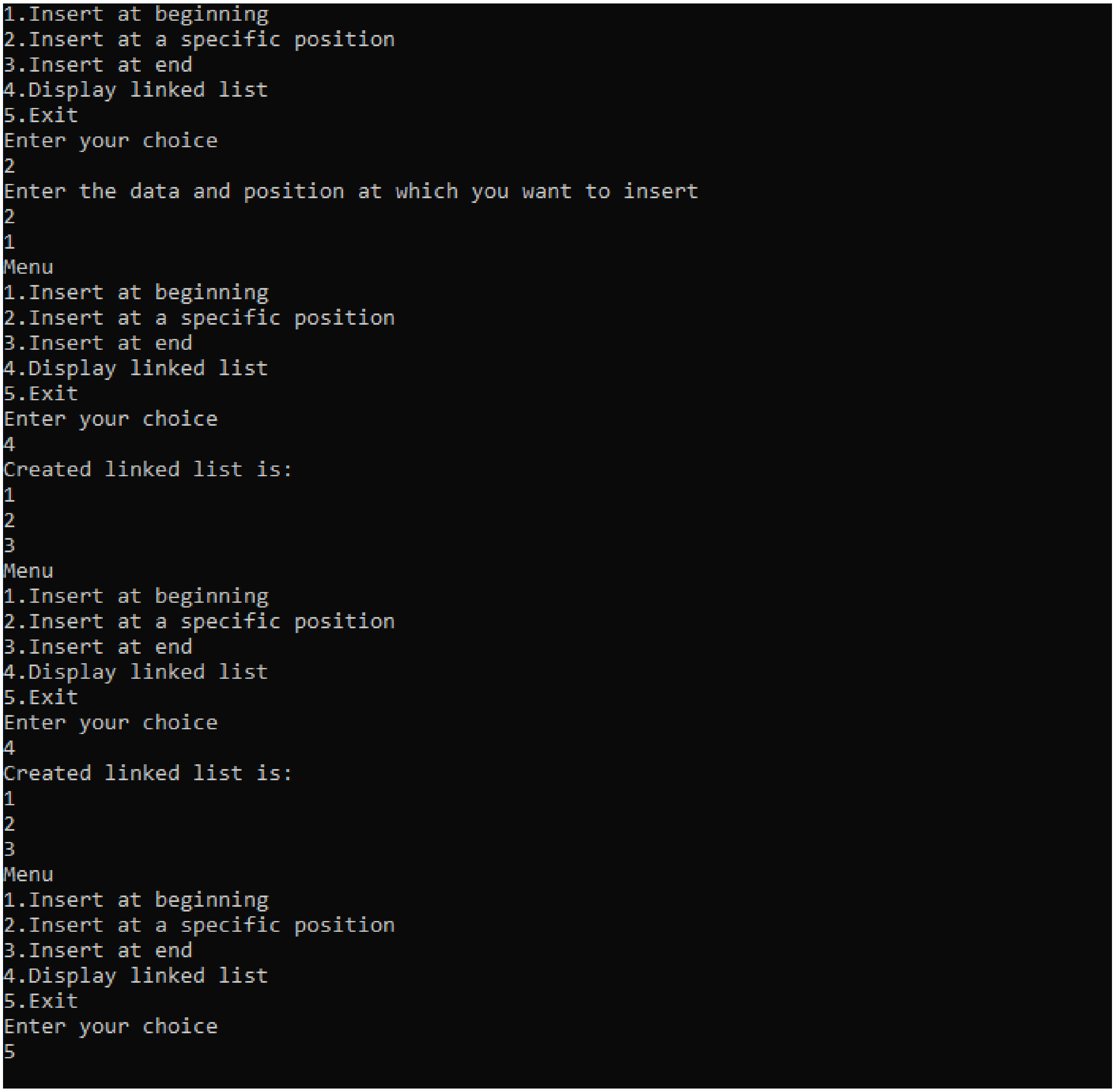
4) WAP to Implement Singly Linked List with following operations
a) Create a linked list.
b) Insertion of a node at first position, at any position and at end of list.
Display the contents of the linked list.

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


typedef struct Node {
   int data;
   struct Node *next;
}Node;

void InsertAtBeginning( Node **head_ref,int new_data);
void InsertAtEnd( Node **head_ref,int new_data);
void Insert( Node **prev_node,int new_data,int pos);
void PrintList(Node * next);

void InsertAtBeginning( Node **head_ref,int new_data)
{
   Node *new_node=(struct Node*)malloc(sizeof( Node));
   new_node->data=new_data;
   new_node->next=*head_ref;
   *head_ref=new_node;
}

void InsertAtEnd(Node **head_ref,int new_data)
{
   Node *new_node=(struct Node*)malloc(sizeof( Node));
   Node *last=*head_ref;
   new_node->data=new_data;
   new_node->next=NULL;
   if (*head_ref==NULL)
   {
      *head_ref=new_node;
      return ;
   }
```

```
    while (last->next!=NULL)
        last=last->next;
    last->next=new_node;

}

void Insert(Node **head_ref,int new_data,int pos)
{
    if (*head_ref ==NULL)
    {
        printf("Cannot  be NULL\n");
        return;
    }
    Node *temp = *head_ref;
    Node *newNode = ( Node *) malloc (sizeof ( Node));
    newNode->data = new_data;
    newNode->next = NULL;

      while (--pos>0)
            {
              temp = temp->next;
            }
            newNode->next = temp->next;
     temp->next = newNode;
}


void PrintList(Node *node)
{
    while (node!=NULL)
    {
        printf("%d\n",node->data);
        node=node->next;
    }
}


int main()
{
    int ch,new,pos;
    Node* head=NULL;
    while(ch!=5)
    {
    printf("Menu\n");
    printf("1.Insert at beginning\n");
    printf("2.Insert at a specific position\n");
    printf("3.Insert at end\n");
    printf("4.Display linked list\n");
    printf("5.Exit\n");
    printf("Enter your choice\n");
    scanf("%d",&ch);
    switch(ch)
    {
        case 1:
        {
        printf("Enter the data you want to insert at beginning\n");
        scanf("%d",&new);
        InsertAtBeginning(&head,new);
        break;
        }
        case 2:
        {
        printf("Enter the data and position at which you want to insert \n");
        scanf("%d%d",&new,&pos);
        Insert(&head,new,pos);
        break;
        }
        case 3:
        {
        printf("Enter the data  you want to insert at end\n");
        scanf("%d",&new);
        InsertAtEnd(&head,new);
        break;
        }
        case 4:
        {
            printf("Created linked list is:\n");
            PrintList(head);
            break;
        }
        case 5:
        {
            return 0;
            break;
        }
        case 6:
        {
            printf("Invalid data!");
```

```
            break;
        }
        }
}
return 0;
}
```

OUTPUT:



```
1.Insert at beginning
2.Insert at a specific position
3.Insert at end
4.Display linked list
5.Exit
Enter your choice
2
Enter the data and position at which you want to insert
2
1
Menu
1.Insert at beginning
2.Insert at a specific position
3.Insert at end
4.Display linked list
5.Exit
Enter your choice
4
Created linked list is:
1
2
3
Menu
1.Insert at beginning
2.Insert at a specific position
3.Insert at end
4.Display linked list
5.Exit
Enter your choice
4
Created linked list is:
1
2
3
Menu
1.Insert at beginning
2.Insert at a specific position
3.Insert at end
4.Display linked list
5.Exit
Enter your choice
5
```