Experiment No. 05

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Roll No. 54

Program:

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

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

node* createlist();
node* Insert_beg(node *head, int x);
node* Insert_end(node *head, int x);
node* Insert_mid(node *head, int x);
node* Delete_beg(node *head);
node* Delete_end(node *head);
node* Delete_mid(node *head);
void PrintList(node *head);

node* createlist()
{
        node *head, *p;
        int i, n;
```

```
        head=NULL;
        printf("Enter no. of nodes:");
        scanf("%d",&n);
        printf("Enter date:");
        for (i=0;i<n;i++)
        {
                if (head==NULL)
                {
                        head = (node*)malloc(sizeof(node));
                        p=head;
                }
                else
                {
                        p->next = (node*)malloc(sizeof(node));
                        p=p->next;
                }
                p->next=NULL;
                scanf("%d", &(p->data));
        }
        printf("\n");
        return head;
}

node* Insert_beg(node *head, int x)
{
        node *p;
        p = (node*)malloc(sizeof(node));
        p->data=x;
```

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

node* Insert_mid(node *head, int x)
{
        node *p, *q;
        int y;
        p = (node*)malloc(sizeof(node));
        p-> data =x;
        p->next=NULL;
        printf("After which element you want to insert the new element:");
   scanf("%d", &y);
        for (q=head; q->next !=NULL && q->data!=y; q=q->next)
                ;
        if (q->next !=NULL)
        {
                p->next=q->next;
                q->next=p;
        }
        else
                printf("No data found");
        return head;
}

node* Insert_end(node *head, int x)
{
```

```
        node *p,*q;
        p=(node*)malloc(sizeof(node));
        p-> data =x;
        p->next=NULL;
        if (head==NULL)
                return p;
        for (q=head; q->next !=NULL; q=q->next)
                ;
        q->next=p;
        return head;
}

node* Delete_beg(node *head)
{
        node *p;
        if (head==NULL)
        {
                printf("Empty Linked List");
                return head;
        }
        p=head;
        head=p->next;
        free(p);
        return head;
}

node* Delete_mid(node *head)
{
```

```
        node *p, *q;
        int i, y;
        if (head==NULL)
        {
                printf("Empty Linked List");
                return head;
        }
        printf("\nEnter data to be deleted:");
        scanf("%d", &y);
        if (head->data==y)
                head= Delete_beg(head);
        for (q=head; q->next->data != y && q->next != NULL; q=q->next)
                ;
        if(q->next==NULL)
        {
                printf("Data not found");
                return head;
        }
        p=q->next;
        q->next =p->next;
        free(p);
        return head;
}

node* Delete_end(node *head)
{
        node *p,*q;
        if(head=NULL);
```

```
	{
		printf("Empty Linked List");
		return head;
	}
	for (q=head; q->next->next !=NULL; q=q->next)
		;
	p=q->next;
	q->next=NULL;
	free(p);
	return head;
}

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

int main()
{
	int ch, insert_option, delete_option, x;
	node *head=NULL;
	do{
		printf("Select operation to perform\n");
		printf(" 1. Create List\n 2. Insert Node\n 3. Delete Node\n 4. 
Display List\n 5. Exit\n");
```

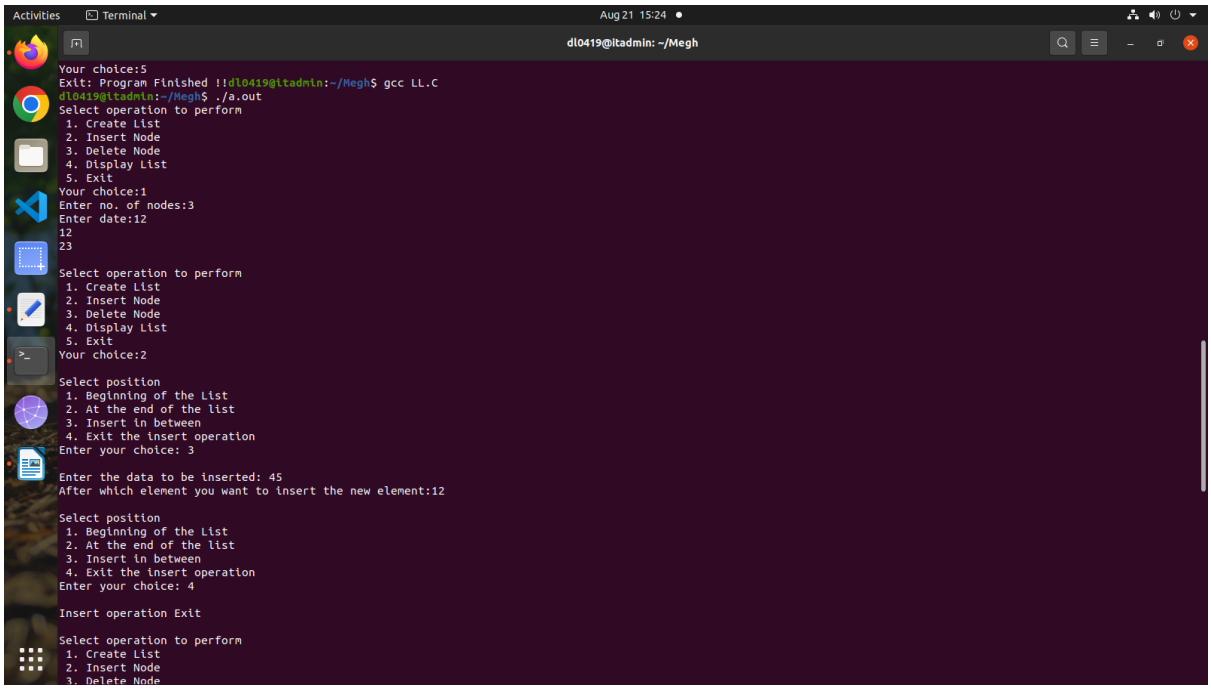
```
            printf("Your choice:");
            scanf("%d", &ch);
            switch(ch)
            {
            case 1:
                    head = createlist();
                    break;
            case 2:
                    do
        {
           printf("\nSelect position \n");
           printf(" 1. Beginning of the List \n 2. At the end of the list \n 3. Insert
in between \n 4. Exit the insert operation \n");
           printf("Enter your choice: ");
           scanf("%d", &insert_option);
           switch (insert_option)
           {
           case 1:
              printf("\nEnter the data to be inserted: ");
              scanf("%d", &x);
              head = Insert_beg(head, x);
              break;
           case 2:
              printf("\nEnter the data to be inserted: ");
              scanf("%d", &x);
              head = Insert_end(head, x);
              break;
           case 3:
```

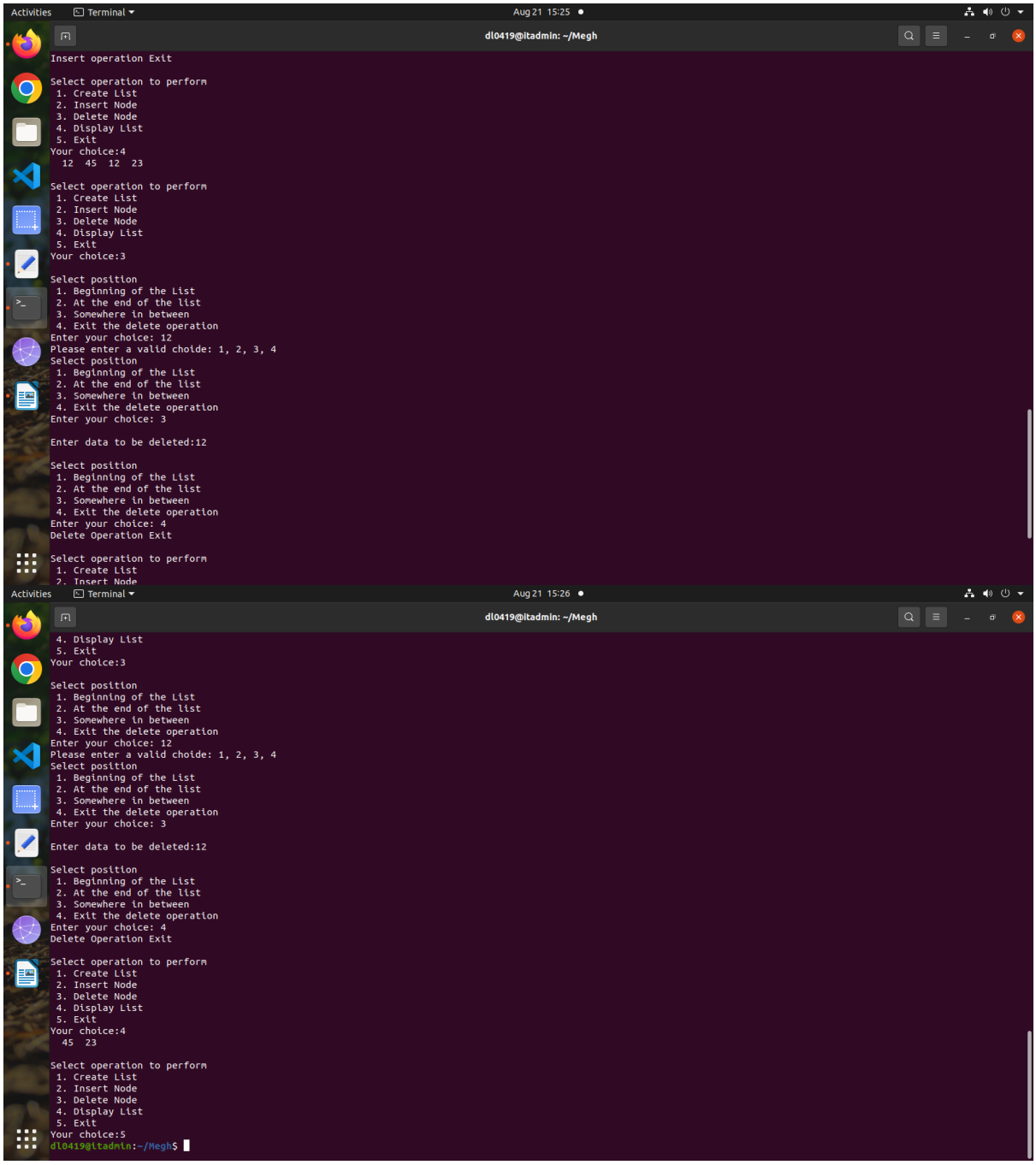
```
            printf("\nEnter the data to be inserted: ");
            scanf("%d", &x);
            head = Insert_mid(head, x);
            break;
        case 4:
            printf("\nInsert operation Exit");
            break;
        default:
            printf("Please enter a valid choide: 1, 2, 3, 4");
        }
    } while (insert_option != 4);
    printf("\n \n");
    break;
          case 3:
    do
    {
        printf("\nSelect position\n");
        printf(" 1. Beginning of the List \n 2. At the end of the list \n 3.
Somewhere in between \n 4. Exit the delete operation \n");
        printf("Enter your choice: ");
        scanf("%d", &delete_option);
        switch (delete_option)
        {
        case 1:
            head = Delete_beg(head);
            break;
        case 2:
            head = Delete_end(head);
```

```
                break;
            case 3:
                head = Delete_mid(head);
                break;
            case 4:
                printf("Delete Operation Exit");
                break;
            default:
                printf("Please enter a valid choide: 1, 2, 3, 4");
            }
        } while (delete_option != 4);
        printf("\n \n");
        break;
    case 4:
        PrintList(head);
        break;
    case 5:
        printf("Exit: Program Finished !!");
        break;
    default:
        printf("Please enter a valid choide: 1, 2, 3, 4, 5");
    }
      }while(ch!=5);
      return 0;

}
```

Output:


Activities
Terminal
Aug 21 15:24
dl0419@itadmin: ~/Megh
Your choice:5
Exit: Program Finished !!dl0419@itadmin:~/Megh$ gcc LL.C
dl0419@itadmin:~/Megh$ ./a.out
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node
4. Display List
5. Exit
Your choice:1
Enter no. of nodes:3
Enter date:12
12
23
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node
4. Display List
5. Exit
Your choice:2
Select position
1. Beginning of the List
2. At the end of the list
3. Insert in between
4. Exit the insert operation
Enter your choice: 3
Enter the data to be inserted: 45
After which element you want to insert the new element:12
Select position
1. Beginning of the List
2. At the end of the list
3. Insert in between
4. Exit the insert operation
Enter your choice: 4
Insert operation Exit
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node


Activities
Terminal
Aug 21 15:25
dl0419@itadmin: ~/Megh
Insert operation Exit
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node
4. Display List
5. Exit
Your choice:4
12 45 12 23
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node
4. Display List
5. Exit
Your choice:3
Select position
1. Beginning of the List
2. At the end of the list
3. Somewhere in between
4. Exit the delete operation
Enter your choice: 12
Please enter a valid choide: 1, 2, 3, 4
Select position
1. Beginning of the List
2. At the end of the list
3. Somewhere in between
4. Exit the delete operation
Enter your choice: 3
Enter data to be deleted:12
Select position
1. Beginning of the List
2. At the end of the list
3. Somewhere in between
4. Exit the delete operation
Enter your choice: 4
Delete Operation Exit
Select operation to perform
1. Create List
2. Insert Node
Activities
Terminal
Aug 21 15:26
dl0419@itadmin: ~/Megh
4. Display List
5. Exit
Your choice:3
Select position
1. Beginning of the List
2. At the end of the list
3. Somewhere in between
4. Exit the delete operation
Enter your choice: 12
Please enter a valid choide: 1, 2, 3, 4
Select position
1. Beginning of the List
2. At the end of the list
3. Somewhere in between
4. Exit the delete operation
Enter your choice: 3
Enter data to be deleted:12
Select position
1. Beginning of the List
2. At the end of the list
3. Somewhere in between
4. Exit the delete operation
Enter your choice: 4
Delete Operation Exit
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node
4. Display List
5. Exit
Your choice:4
45 23
Select operation to perform
1. Create List
2. Insert Node
3. Delete Node
4. Display List
5. Exit
Your choice:5
dl0419@itadmin:~/MeghS