

DSA Practical No -4

AIM :- Implement a single linked list and perform the operation like insertion, deletion and traversal

Program:

// implement a single linked list and perform the operation like insertion, deletion and traversal.

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

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

```
#include <stdbool.h>
```

```
struct node
```

```
{
```

```
    int data;
```

```
    struct node *next;
```

```
    struct node *priv;
```

```
};
```

```
int main()
```

```
{
```

```
    struct node *a, *b, *c, *d, *e, *f, *g;
```

```
    int search;
```

```
    a = (struct node *)malloc(sizeof(struct node));
```

```
    b = (struct node *)malloc(sizeof(struct node));
```

```
    c = (struct node *)malloc(sizeof(struct node));
```

```
    d = (struct node *)malloc(sizeof(struct node));
```

```
    e = (struct node *)malloc(sizeof(struct node));
```

```
f = (struct node *)malloc(sizeof(struct node));
```

```
a->data = 12;
```

```
b->data = 22;
```

```
c->data = 32;
```

```
d->data = 80;
```

```
e->data = 200;
```

```
a->next = b;
```

```
b->next = c;
```

```
c->next = d;
```

```
d->next = e;
```

```
e->next = NULL;
```

```
struct node *p = a;
```

```
printf("Traversal of the linked list in forward direction: \n");
```

```
while (p != NULL)
```

```
{
```

```

    printf("%d\t", p->data);

    p = p->next;
}

struct node *m = e;

printf("\n");

m = a;

printf("Enter the node after which you have to insert the data:\n");
scanf("%d", &search);
while (m != NULL && m->data != search)
{
    m = m->next;
};

if (m->data == search)
{
    printf("Enter the data of the new node:\n");
    scanf("%d", &f->data);
    f->next = m->next;
    f->prev = m;
    m->next = f;
}else
{
    printf("The searching data not found\n");
}

```

```
m = a;
while (m != NULL)
{
    printf("%d\t", m->data);
    m = m->next;
}
```

```
printf("\n");
```

```
m = a;
```

```
printf("Enter the node which you have to DELETE:\n");
```

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

```
while (m != NULL && m->data != search)
```

```
{
    g = m;
    m = m->next;
}
```

```
if (m->data == search)
```

```
{
    g->next = m->next;
    free(m);
}
```

```
else
```

```
{
    printf("The data not found.\n");
}
```

```

m = a;

while (m != NULL)

{

    printf("%d\t", m->data);

    m = m->next;

}

return 0;

}

```

Output:

```

PS C:\Users\mithaw\OneDrive\Desktop\c program> gcc linklist1.c
PS C:\Users\mithaw\OneDrive\Desktop\c program> .\a.exe
Traversal of the linked list in forward direction:
12    22    32    80    200
Enter the node after which you have to insert the data:
32
Enter the data of the new node:
42
12    22    32    42    80    200
Enter the node which you have to DELETE:
80
12    22    32    42    200
PS C:\Users\mithaw\OneDrive\Desktop\c program>

```

Github link : <https://github.com/MayurThaware122/DSA>