

```
#include <iostream>
```

```
using namespace std;
```

```
struct TNode
```

```
{
```

```
    string data;
```

```
    TNode *next;
```

```
    TNode *prev;
```

```
}*head;
```

```
void inIt()
```

```
{
```

```
    head = NULL;
```

```
}
```

```
bool isEmpty()
```

```
{
```

```
    if(head==NULL)
```

```
    {
```

```
        return true;
```

```
    }
```

```
    else
```

```
    {
```

```
        return false;
```

```
    }
```

```
}
```

```
void insertDepan(string kata)
```

```

{
    TNode *baru = new TNode;
    baru->data=kata;
    baru->next=NULL;
    baru->prev=NULL;

    if(isEmpty())
    {
        head = baru;
        head->prev=NULL;
        head->next=NULL;
    }
    else
    {
        head->next=head;
        head->prev=baru;
        head=baru;
    }
}

```

```

void insertBelakang(string kata)
{
    TNode *baru=new TNode;
    baru->data=kata;
    baru->next=NULL;
    baru->prev=NULL;

    if(isEmpty())
    {

```

```

        head=baru;
        head->prev=NULL;
        head->next=NULL;
    }
    else
    {
        TNode *bantu=new TNode;
        bantu=head;
        while(bantu->next!=NULL)
        {
            bantu=bantu->next;
        }
        bantu->next=baru;
        bantu->prev=bantu;
    }
}

void hapusDepan()
{
    if(isEmpty())
    {
        cout<<"list kosong";
    }
    else
    {
        if(head->next==NULL)
        {
            cout<<head->data<<"data telah terhapus";

```

```

        head=NULL;
    }
    else
    {
        TNode *hapus=new TNode;
        hapus=head;
        head=head->next;
        head->prev=NULL;
        cout<<hapus->data<<"telah terhapus";
        delete (hapus);
    }
}
}

```

```

void hapusBelakang()
{
    if(isEmpty())
    {
        cout<<"list kosong";
    }
    else
    {
        if(head->next==NULL)
        {
            cout<<head->data<<"telah dihapus";
            head=NULL;
        }
        else
        {

```

```

        TNode *bantu=new TNode;
        bantu=head;
        while(bantu->next->next!=NULL)
        {
            bantu=bantu->next;
        }
        TNode *hapus=new TNode;
        hapus=bantu->next;
        bantu->next=NULL;
        cout<<hapus->data<<"telah dihapus";
        delete(hapus);
    }
}

```

```

void cetak()
{
    if(isEmpty())
    {
        cout<<"list kosong";
    }
    else
    {
        TNode *bantu=new TNode;
        bantu=head;
        while(bantu!=NULL)
        {
            cout<<bantu->data<<" ";
            bantu = bantu->next;
        }
    }
}

```

```

    }

}

}

int main()
{
    int menu;
    inlt();
    while (menu!=6)
    {
        cout<<"\nMENU"<<endl;
        cout<<"1.Insert depan"<<endl;
        cout<<"2.Insert belakang"<<endl;
        cout<<"3.Hapus depan"<<endl;
        cout<<"4.Hapus belakang"<<endl;
        cout<<"5.Tampil"<<endl;
        cout<<"6.Keluar"<<endl;
        cout<<"Masukkan Pilihan Anda : ";
        cin>>menu;
        if(menu==1)
        {
            string input;
            cout<<"Masukkan data : ";
            cin>>input;
            insertDepan(input);
            cout<<input<<"telah dimasukkan";
        }
        else if(menu==2)
        {

```

```

        string input;
        cout<<"Masukkan data : ";
        cin>>input;
        insertBelakang(input);
        cout<<input<<"telah dimasukkan";
    }
    else if(menu==3)
    {
        hapusDepan();
    }
    else if(menu==4)
    {
        hapusBelakang();
    }
    else if(menu==5)
    {
        cetak();
    }
    else
    {
        return false;
    }
}
}

```