Question 1

#include<iostream>

using namespace std;

class node{

public:

char data;

node\* next;

node(char d)

{

this->data=d;

this->next=NULL;

}

void create(node\* &head)

{

char c;

cout<<"enter the data : ";

cin>>c;

node\* n=new node(c);

if(head==NULL)

{

head=n;

return;

}

node\* temp=head;

while(temp->next!=NULL)temp=temp->next;

temp->next=n;

}

void del(node\*& head1,node\*& head2)

{

node\* t2=head2;

node\* t1=head1;

int count=0;

node\* s1=NULL;

node\* s2=NULL;

int c=0;

while(t1!=NULL)

{

node\* rr=t1;

t2=head2;

while(t2!=NULL)

{

node\* e=t2;

if(t2->data==t1->data )

{

s1=t1;

c=1;

node\* c1=t1;

node\* c2=t2;

for(int jj=0;jj<3;jj++)

{

if(c1->next!=NULL && c2->next!=NULL){c1=c1->next;c2=c2->next; if(c1->data==c2->data) c++;}

}

if(c==3)

{

if(s1==head1)

{

head1=c1->next;

delete(s1);

}

else

{

node\* h=head1;

while(h->next!=s1)h=h->next;

h->next=c1->next;

delete(s1);

}

return;

}

}

t2=e->next;

}

t1=rr->next;

}

}

void print(node\*&head)

{

node\* temp=head;

if(head==NULL)

{

cout<<"NULL\n";

return;

}

while(temp!=NULL)

{

cout<<temp->data<<"->";

temp=temp->next;

}

cout<<"NULL\n";

}

};

int main()

{

int n;

node\* head1=NULL;

node\* head2=NULL;

cout<<"enter the length of s1 : ";

cin>>n;

for(int i=0;i<n;i++)

{

head1->create(head1);

}

cout<<"enter the length of s2 : ";

cin>>n;

for(int i=0;i<n;i++)

{

head2->create(head2);

}

head1->print(head1);

head2->print(head2);

head1->del(head1,head2);

head1->print(head1);

}

Question 2

#include <iostream>

using namespace std;

class node

{

public:

int data;

node \*next;

node(int d)

{

this->data = d;

this->next = NULL;

}

void create(node \*&head)

{

int d;

cout << "enter the data : ";

cin >> d;

node \*n = new node(d);

if (head == NULL)

{

n->next = n;

head = n;

return;

}

node \*temp = head;

while (temp->next != head)

{

temp = temp->next;

}

n->next = temp->next;

temp->next = n;

}

int size(node \*&head)

{

node \*temp = head;

if (head == NULL)

return 0;

int c = 1;

while (temp->next != head)

{

c++;

temp = temp->next;

}

return c;

}

void print(node \*&head)

{

node \*temp = head;

while (temp->next != head)

{

cout << temp->data << "->";

temp = temp->next;

}

cout << temp->data << "->";

}

void solve(node \*&head)

{

int n = head->size(head);

if (n < 7)

{

while (head->size(head) != 7)

{

if (n == 0)

return;

int c = 1;

node \*temp = head;

node \*ne = new node(0);

while (c < (n - 2 + 1))

{

c++;

temp = temp->next;

}

ne->next = temp->next;

temp->next = ne;

}

head->print(head);

}

else if(n>7)

{

node \* temp=head->next;

int c=1;

while(c<7)

{

cout<<temp->data<<" ";

c++;

temp=temp->next;

}

cout<<endl;

}

else

{

head->print(head);

}

}

};

int main()

{

node \*head = NULL;

int n;

cout<<"enter the length of the link list : ";

cin>>n;

for (int i = 0; i <n; i++)

{

head->create(head);

}

cout<<"link list: ";

head->print(head);

cout<<"\n";

head->solve(head);

cout<<" \n";

}

Question 3

#include<iostream>

using namespace std;

class node{

public:

char data;

node\* next;

node(char d)

{

this->data=d;

this->next=NULL;

}

void create(node\* &head)

{

char c;

cout<<"enter the data : ";

cin>>c;

node\* n=new node(c);

if(head==NULL)

{

head=n;

return;

}

node\* temp=head;

while(temp->next!=NULL)temp=temp->next;

temp->next=n;

}

node \* rev( node \* & head)

{

if(head==NULL || head->next==NULL)return head;

node\* c=rev(head->next);

head->next->next=head;

head->next=NULL;

return c;

}

void print(node\*&head)

{

node\* temp=head;

if(head==NULL)

{

cout<<"NULL\n";

return;

}

while(temp!=NULL)

{

cout<<temp->data<<"->";

temp=temp->next;

}

cout<<"NULL\n";

}

};

int main()

{

int n;

node\* head1=NULL;

cout<<"enter the length of link list : ";

cin>>n;

for(int i=0;i<n;i++)

{

head1->create(head1);

}

cout<<"before reverse : ";

head1->print(head1);

cout<<"link list after reverse : ";

head1=head1->rev(head1);

head1->print(head1);

}

Question 4

#include<iostream>

using namespace std;

class node{

public:

int coff;

int pow;

node \* next;

node(int c,int p)

{

this->coff=c;

this->pow=p;

this->next=NULL;

}

void create (node \* & head,int c,int p)

{

node \* n=new node (c,p);

if(head==NULL)

{

head=n;

return;

}

node \* temp=head;

while(temp->next!=NULL) temp=temp->next;

temp->next=n;

}

void print(node \* & head)

{

node\* temp=head;

cout<<temp->coff<<" x^"<<temp->pow;

temp=temp->next;

while(temp!=NULL)

{

cout<<" + "<<temp->coff<<" x^"<<temp->pow;

temp=temp->next;

}

}

node\* multiply(node\*&p1,node\*&p2)

{

node\* ans=NULL;

node\* i=p1;

while(i!=NULL)

{

node\*j=p2;

while(j!=NULL)

{

ans->create(ans,i->coff\*j->coff,i->pow+j->pow);

j=j->next;

}

i=i->next;

}

return ans;

}

// sort in decreasing order

void sort(node \* & head)

{

node\* i=head;

while(i!=NULL)

{

node \* j=i;

int tc=i->coff;

int tp=i->pow;

node\* max=i;

while(j!=NULL)

{

if(j->pow> max->pow) max=j;

j=j->next;

}

i->coff=max->coff;

i->pow=max->pow;

max->coff=tc;

max->pow=tp;

i=i->next;

}

}

};

int main()

{

node\* p1=NULL;

int n1;

cout<<"enter the length of polynomial 1 : ";

cin>>n1;

for(int i=0;i<n1;i++)

{

int c;

cout<<"enter the coefficient ";

cin>>c;

int p;

cout<<"enter the power of x : ";

cin>>p;

p1->create(p1,c,p);

}

node\* p2=NULL;

int n2;

cout<<"enter the length of polynomial 2 : ";

cin>>n2;

for(int i=0;i<n2;i++)

{

int c;

cout<<"enter the coefficient ";

cin>>c;

int p;

cout<<"enter the power of x : ";

cin>>p;

p2->create(p2,c,p);

}

cout<<"( ";

p1->print(p1);

cout<<" )\*(";

p2->print(p2);

cout<<") = ";

node \* m= p1->multiply(p1,p2);

m->sort(m);

m->print(m);

cout<<"\n= ";

node\* i=m;

while( i!=NULL && i->next!=NULL )

{

node\*j=i;

if(i->next!=NULL)j=j->next;

int c=0;

while(j!=NULL && i->pow==j->pow)

{

c+=j->coff;

j=j->next;

}

i->coff+=c;

if(c!=0)

i->next=j;

i=i->next;

}

m->print(m);

}

Question 5

#include <iostream>

using namespace std;

class node

{

public:

int data;

node \*next;

node(int d)

{

this->data = d;

this->next = NULL;

}

void create(node \*&head)

{

int d;

cout << "enter the data : ";

cin >> d;

node \*n = new node(d);

if (head == NULL)

{

n->next = n;

head = n;

return;

}

node \*temp = head;

while (temp->next != head)

{

temp = temp->next;

}

n->next = temp->next;

temp->next = n;

}

void del(node \*&head, int d)

{

node \*temp = head;

if (head->data == d)

{

while (temp->next != head)

{

temp=temp->next;

}

head=head->next;

node\* to=temp->next;

temp->next=head;

delete(to);

return;

}

while (temp->next != head)

{

if (temp->next->data == d)

{

temp->next = temp->next->next;

cout << "deleted";

return;

}

temp=temp->next;

}

cout<<"element is not found " ;

}

int size(node \*&head)

{

node \*temp = head;

if (head == NULL)

return 0;

int c = 1;

while (temp->next != head)

{

c++;

temp = temp->next;

}

return c;

}

void print(node \*&head)

{

node \*temp = head;

while (temp->next != head)

{

cout << temp->data << "->";

temp = temp->next;

}

cout << temp->data << "->";

}

};

int main()

{

node \*head = NULL;

int n;

cout << "enter the length of the link list : ";

cin >> n;

for (int i = 0; i < n; i++)

{

head->create(head);

}

cout << "link list: ";

head->print(head);

int d;

cout<<"enter the value to be deleted :";

cin>>d;

head->del(head,d);

head->print(head);

}

Question 6

#include<bits/stdc++.h>

using namespace std;

class node{

public:

char data;

node\* next;

node(char d)

{

this->data=d;

this->next=NULL;

}

void create(node\* &head)

{

char c;

cout<<"enter the data : ";

cin>>c;

node\* n=new node(c);

if(head==NULL)

{

head=n;

return;

}

node\* temp=head;

while(temp->next!=NULL)temp=temp->next;

temp->next=n;

}

void sort( node \* & head)

{

node\* i=head;

while(i!=NULL)

{

char d=i->data;

node \* j=i;

node\* min=i;

while(j!=NULL)

{

if(j->data<min->data)

{

min=j;

}

j=j->next;

}

i->data=min->data;

min->data=d;

i=i->next;

}

}

void print(node\*&head)

{

node\* temp=head;

if(head==NULL)

{

cout<<"NULL\n";

return;

}

while(temp!=NULL)

{

cout<<temp->data<<"->";

temp=temp->next;

}

cout<<"NULL\n";

}

};

int main()

{

int n;

node\* head1=NULL;

cout<<"enter the length of s1 : ";

cin>>n;

for(int i=0;i<n;i++)

{

head1->create(head1);

}

head1->sort(head1);

head1->print(head1);

map<char,int> m;

node\* temp=head1;

while(temp!=NULL)

{

m[temp->data]++;

temp=temp->next;

}

cout<<"node : occurrence\n";

for(auto i:m)

{

cout<<i.first<<" :"<<i.second<<endl;

}

}

Question 7

#include<iostream>

using namespace std;

class node{

public:

char data;

node\* next;

node(char d)

{

this->data=d;

this->next=NULL;

}

void create(node\* &head)

{

char c;

cout<<"enter the data : ";

cin>>c;

node\* n=new node(c);

if(head==NULL)

{

head=n;

return;

}

node\* temp=head;

while(temp->next!=NULL)temp=temp->next;

temp->next=n;

}

node \* rev( node \* & head)

{

if(head==NULL || head->next==NULL)return head;

node\* c=rev(head->next);

head->next->next=head;

head->next=NULL;

return c;

}

void print(node\*&head)

{

node\* temp=head;

if(head==NULL)

{

cout<<"NULL\n";

return;

}

while(temp!=NULL)

{

cout<<temp->data<<"->";

temp=temp->next;

}

cout<<"NULL\n";

}

};

int main()

{

int n;

node\* head1=NULL;

cout<<"enter the length of s1 : ";

cin>>n;

for(int i=0;i<n;i++)

{

head1->create(head1);

}

head1->print(head1);

node\* fast=head1;

node\* slow=head1;

while(fast->next!=NULL)

{

fast=fast->next;

if(fast->next!=NULL)fast=fast->next;

slow=slow->next;

}

if(head1->next==NULL)

{

cout<<"yes palindrom";

return;

}

if(head1->next->next==NULL)

{

if(head1->data==head1->next->data)

{

cout<<"yes palindrom";

}

else cout<<"not palindrom";

return 1;

}

slow->next=slow->rev(slow->next);

node \* temp=head1;

slow=slow->next;

while(slow!=NULL)

{

if(slow->data!=temp->data){cout<<"no : palindrom"; return 1;}

slow=slow->next;

temp=temp->next;

}

cout<<"yes : palindrom";

}