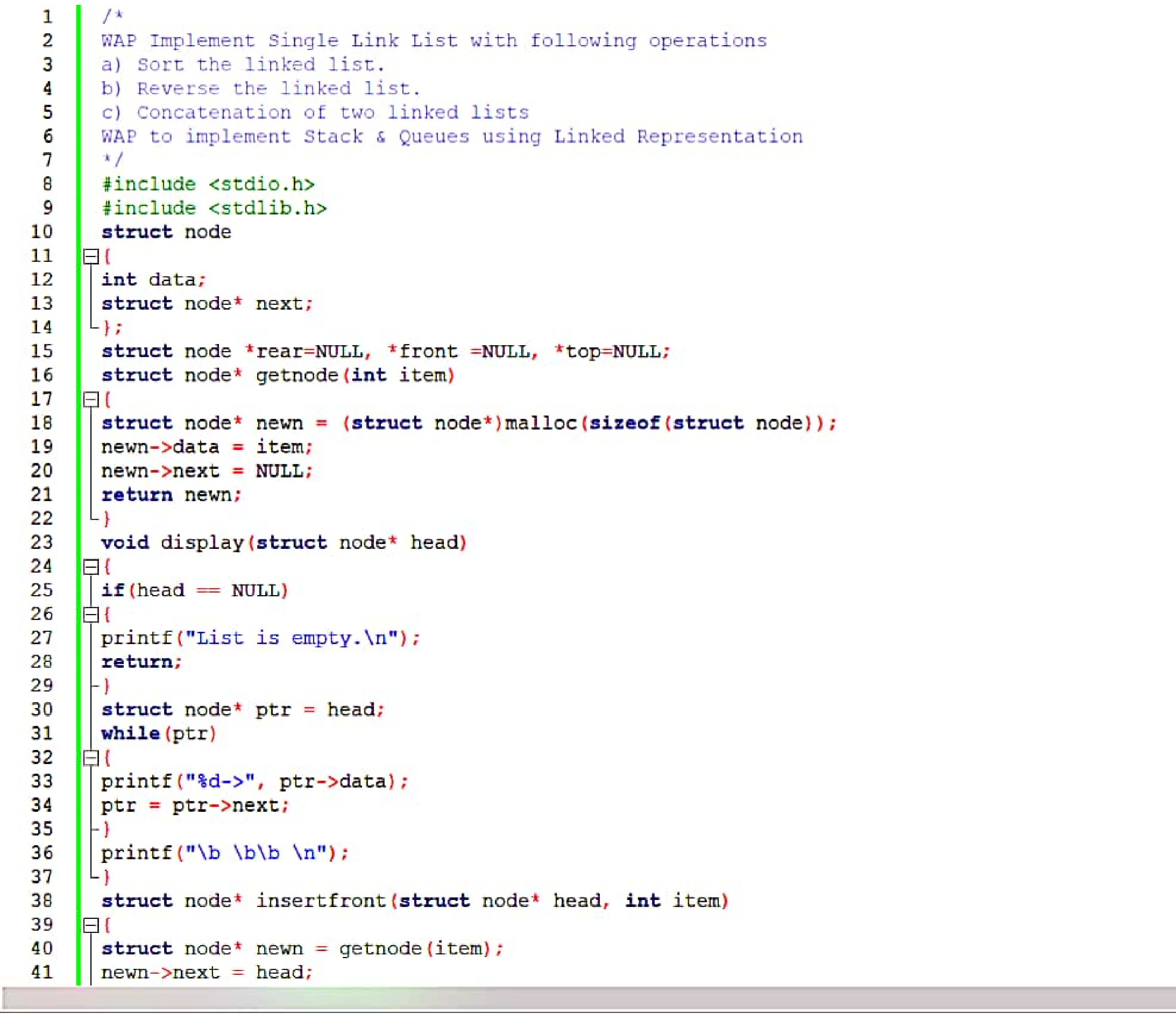
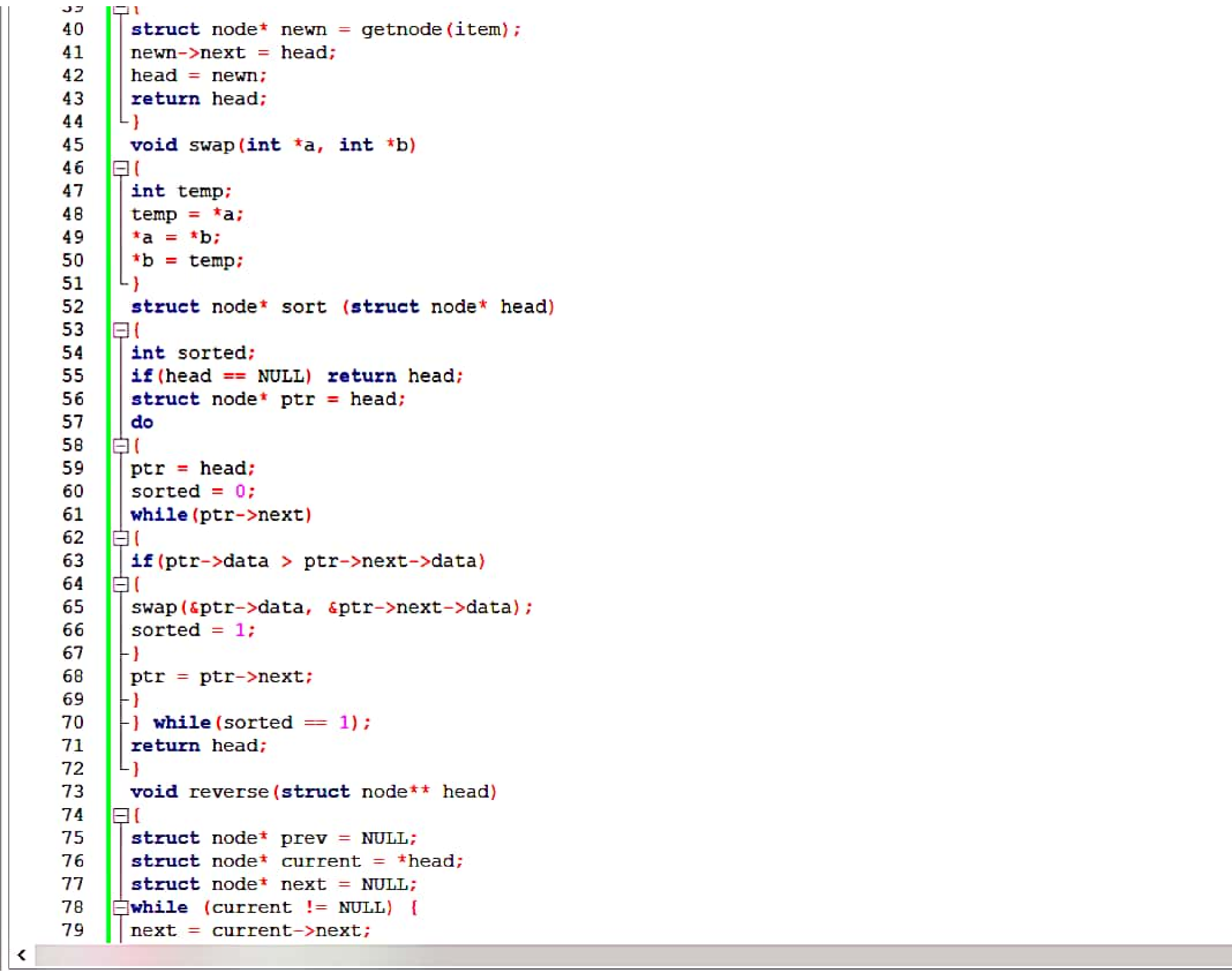
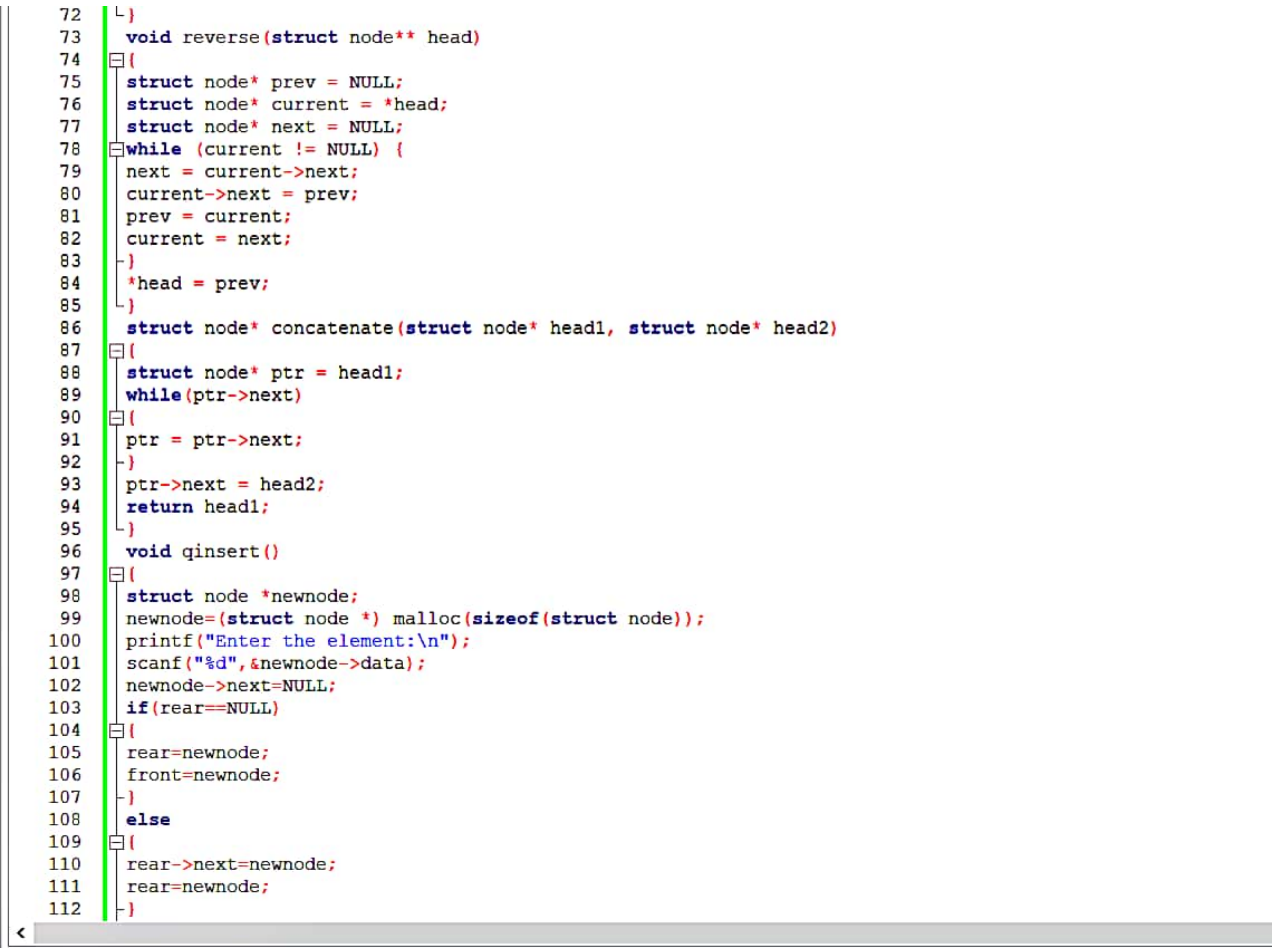


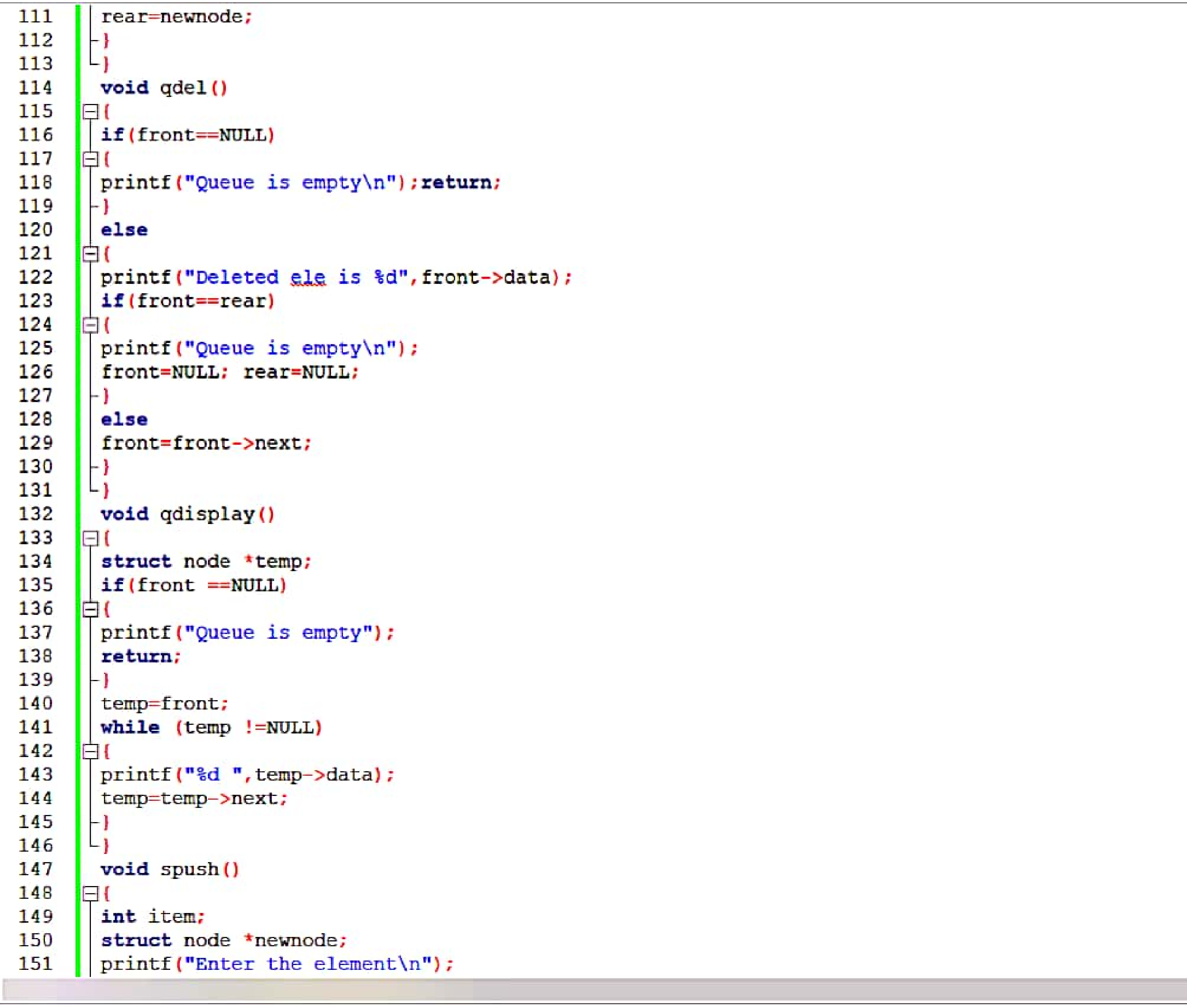
```c
/*
WAP Implement Single Link List with following operations
a) Sort the linked list.
b) Reverse the linked list.
c) Concatenation of two linked lists
WAP to implement Stack & Queues using Linked Representation
*/
#include <stdio.h>
#include <stdlib.h>
struct node
{
int data;
struct node* next;
};
struct node *rear=NULL, *front =NULL, *top=NULL;
struct node* getnode(int item)
{
struct node* newn = (struct node*)malloc(sizeof(struct node));
newn->data = item;
newn->next = NULL;
return newn;
}
void display(struct node* head)
{
if(head == NULL)
{
printf("List is empty.\n");
return;
}
struct node* ptr = head;
while(ptr)
{
printf("%d->", ptr->data);
ptr = ptr->next;
}
printf("\b \b\b \n");
}
struct node* insertfront(struct node* head, int item)
{
struct node* newn = getnode(item);
newn->next = head;
```



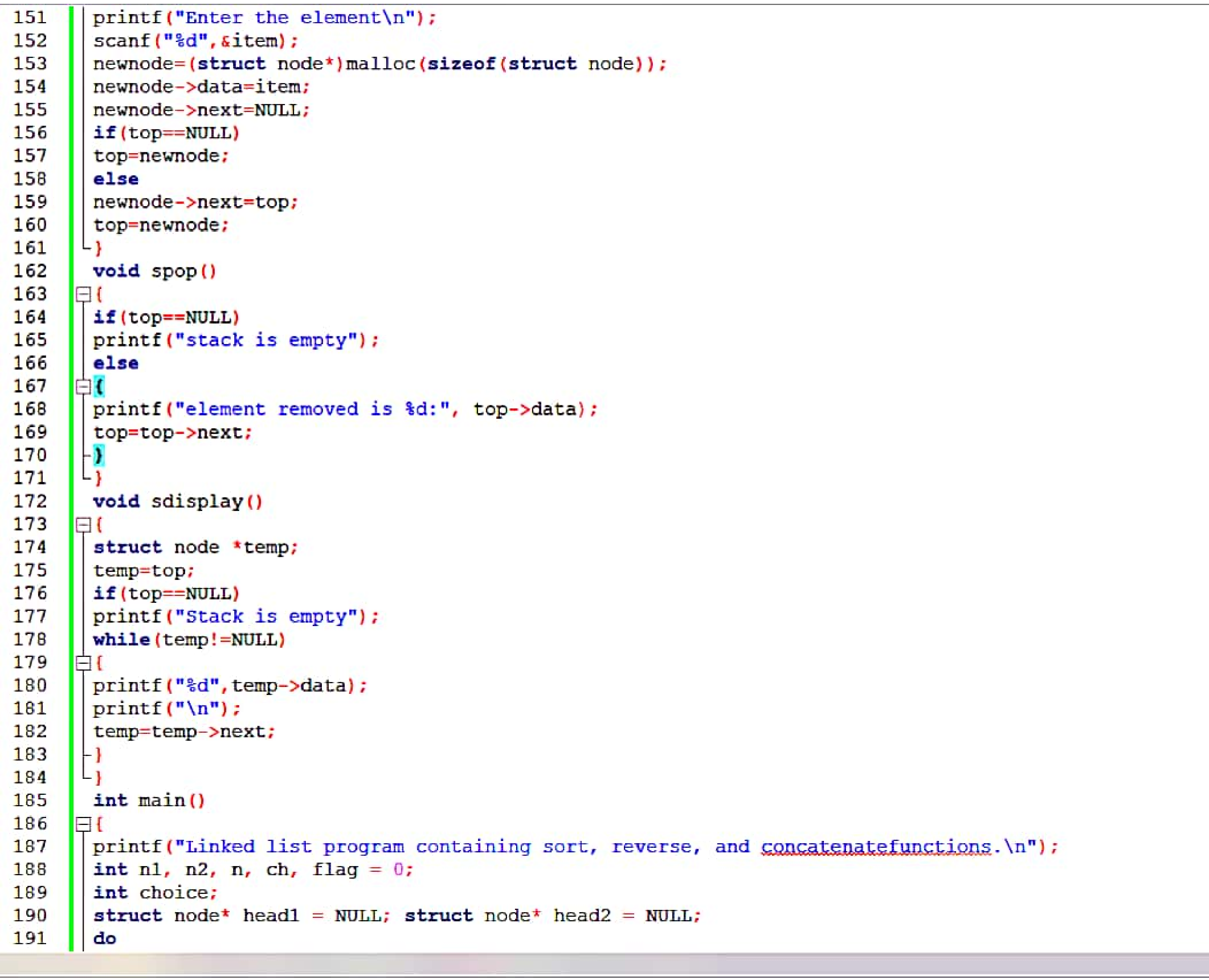
```
{
struct node* newn = getnode(item);
newn->next = head;
head = newn;
return head;
}
void swap(int *a, int *b)
{
int temp;
temp = *a;
*a = *b;
*b = temp;
}
struct node* sort (struct node* head)
{
int sorted;
if(head == NULL) return head;
struct node* ptr = head;
do
{
ptr = head;
sorted = 0;
while(ptr->next)
{
if(ptr->data > ptr->next->data)
{
swap(&ptr->data, &ptr->next->data);
sorted = 1;
}
ptr = ptr->next;
}
} while(sorted == 1);
return head;
}
void reverse(struct node** head)
{
struct node* prev = NULL;
struct node* current = *head;
struct node* next = NULL;
while (current != NULL) {
next = current->next;
```



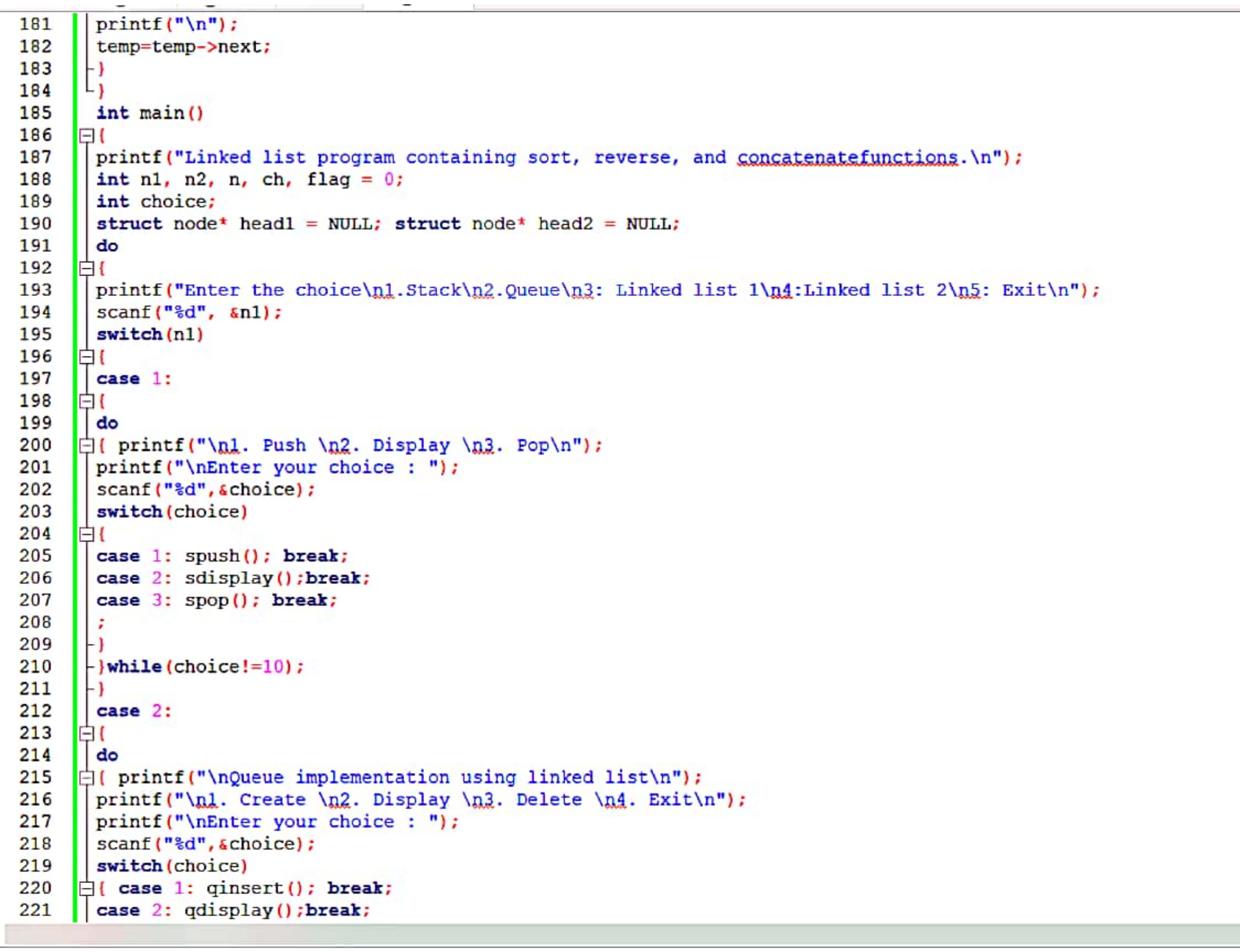
```c
}
void reverse(struct node** head)
{
struct node* prev = NULL;
struct node* current = *head;
struct node* next = NULL;
while (current != NULL) {
next = current->next;
current->next = prev;
prev = current;
current = next;
}
*head = prev;
}
struct node* concatenate(struct node* head1, struct node* head2)
{
struct node* ptr = head1;
while(ptr->next)
{
ptr = ptr->next;
}
ptr->next = head2;
return head1;
}
void qinsert()
{
struct node *newnode;
newnode=(struct node *) malloc(sizeof(struct node));
printf("Enter the element:\n");
scanf("%d",&newnode->data);
newnode->next=NULL;
if(rear==NULL)
{
rear=newnode;
front=newnode;
}
else
{
rear->next=newnode;
rear=newnode;
}
```



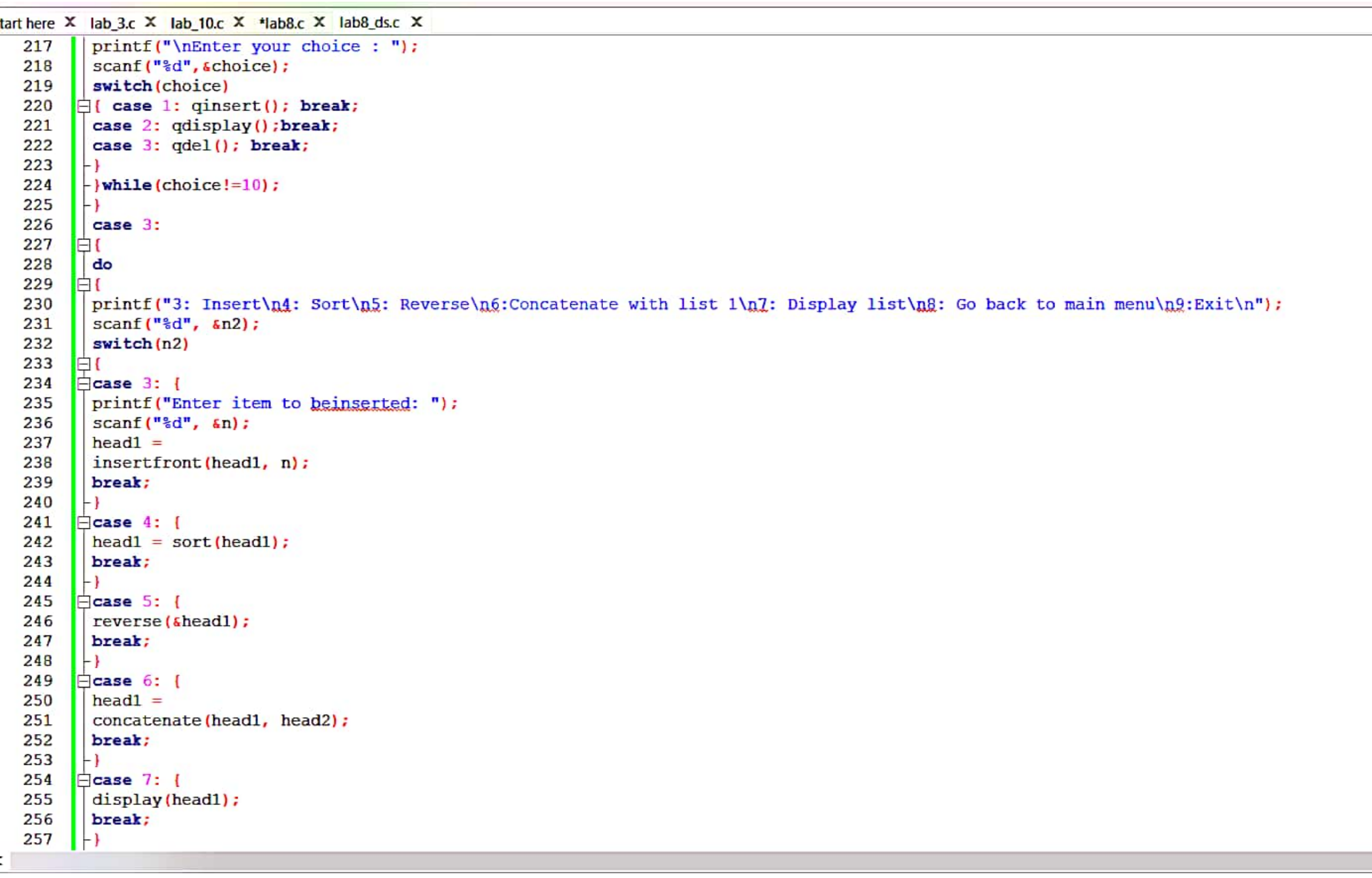
```c
rear=newnode;
}
}
void qdel()
{
if(front==NULL)
{
printf("Queue is empty\n");return;
}
else
{
printf("Deleted ele is %d",front->data);
if(front==rear)
{
printf("Queue is empty\n");
front=NULL; rear=NULL;
}
else
front=front->next;
}
}
void qdisplay()
{
struct node *temp;
if(front ==NULL)
{
printf("Queue is empty");
return;
}
temp=front;
while (temp !=NULL)
{
printf("%d ",temp->data);
temp=temp->next;
}
}
void spush()
{
int item;
struct node *newnode;
printf("Enter the element\n");
```



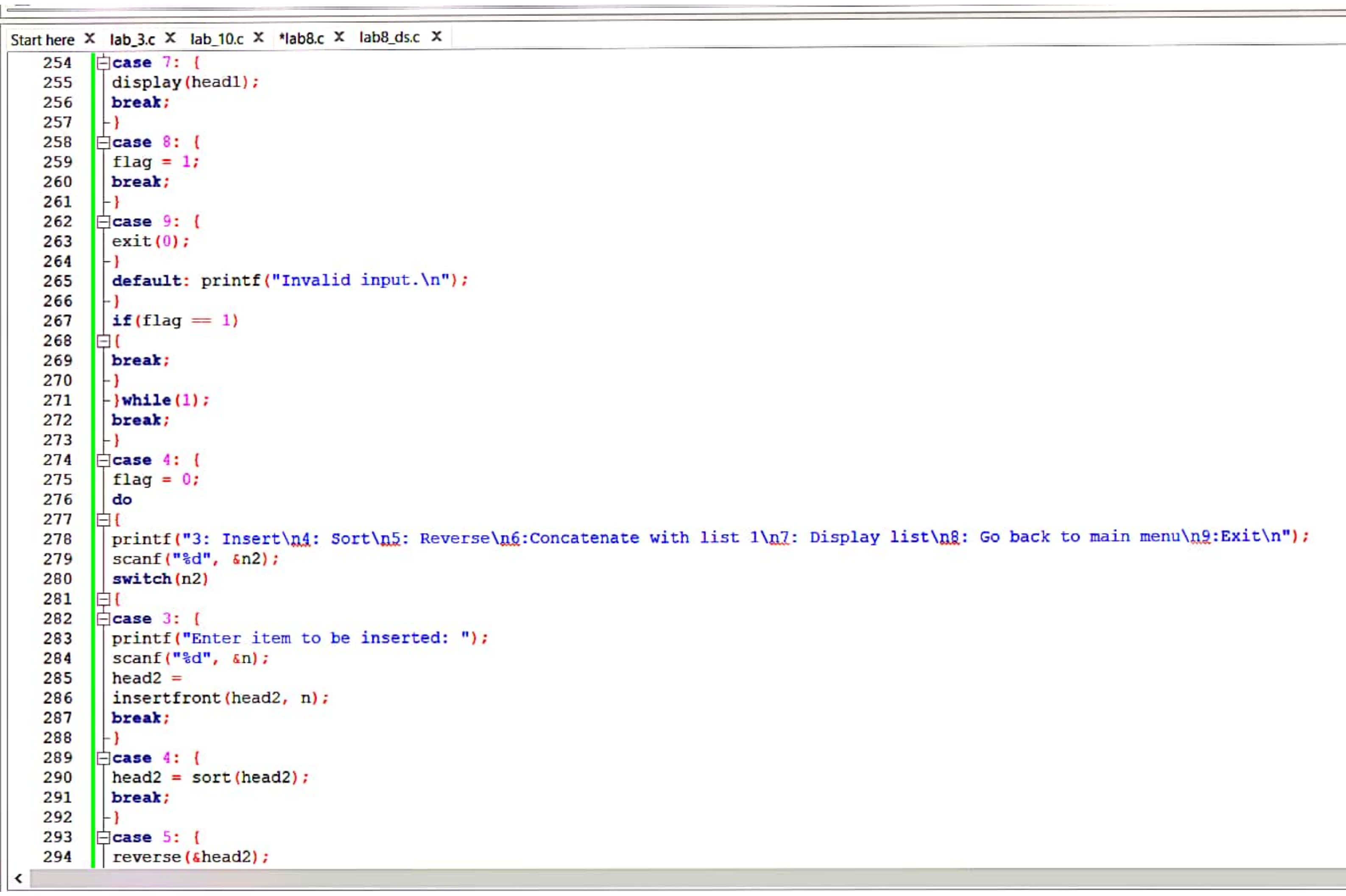
```c
printf("Enter the element\n");
scanf("%d",&item);
newnode=(struct node*)malloc(sizeof(struct node));
newnode->data=item;
newnode->next=NULL;
if(top==NULL)
top=newnode;
else
newnode->next=top;
top=newnode;
}
void spop()
{
if(top==NULL)
printf("stack is empty");
else
{
printf("element removed is %d:", top->data);
top=top->next;
}
}
void sdisplay()
{
struct node *temp;
temp=top;
if(top==NULL)
printf("Stack is empty");
while(temp!=NULL)
{
printf("%d",temp->data);
printf("\n");
temp=temp->next;
}
}
int main()
{
printf("Linked list program containing sort, reverse, and concatenatefunctions.\n");
int n1, n2, n, ch, flag = 0;
int choice;
struct node* head1 = NULL; struct node* head2 = NULL;
do
```



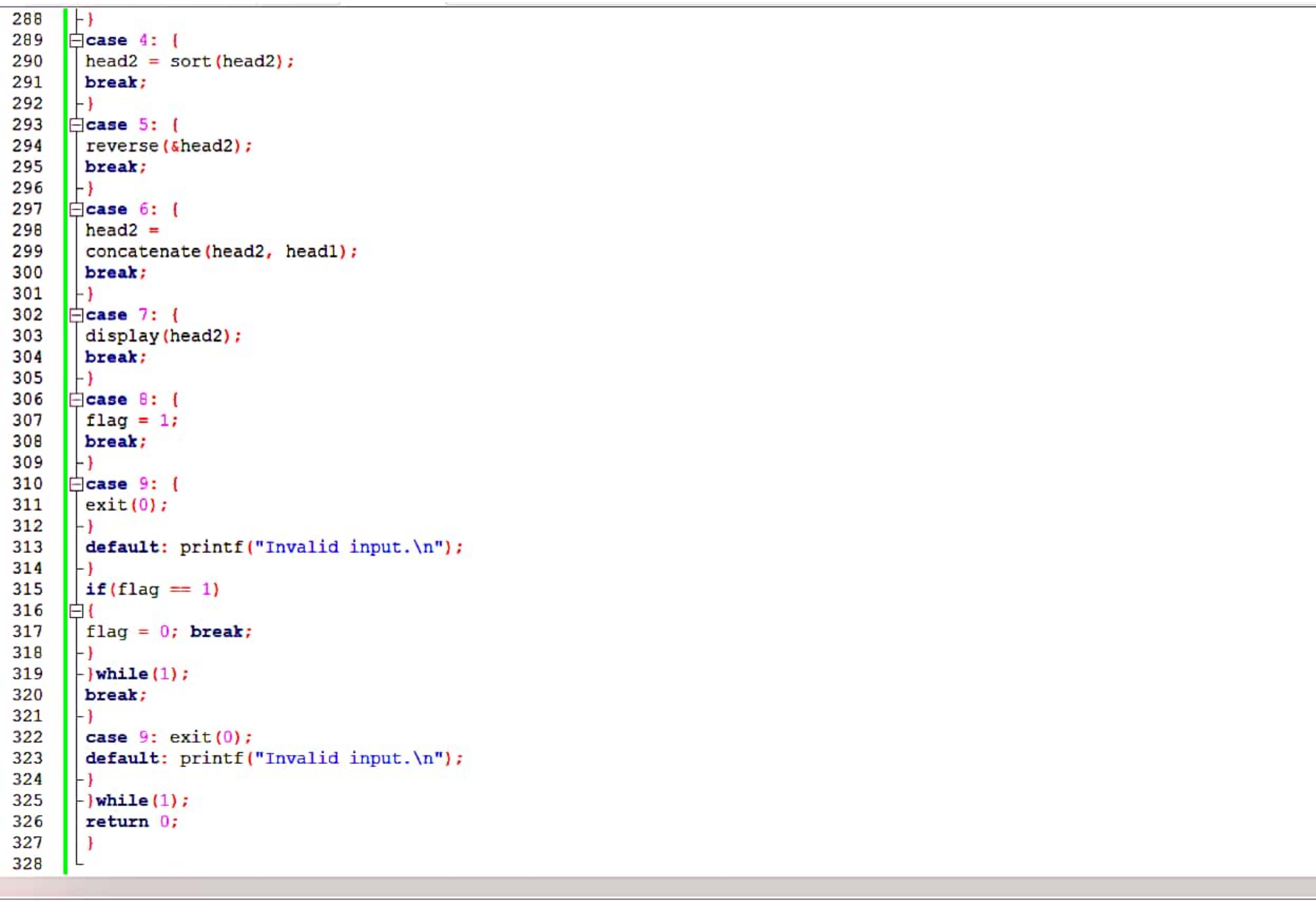
```c
printf("\n");
temp=temp->next;
}
}
int main()
{
printf("Linked list program containing sort, reverse, and concatenatefunctions.\n");
int n1, n2, n, ch, flag = 0;
int choice;
struct node* head1 = NULL; struct node* head2 = NULL;
do
{
printf("Enter the choice\n1.Stack\n2.Queue\n3: Linked list 1\n4:Linked list 2\n5: Exit\n");
scanf("%d", &n1);
switch(n1)
{
case 1:
{
do
{ printf("\n1. Push \n2. Display \n3. Pop\n");
printf("\nEnter your choice : ");
scanf("%d",&choice);
switch(choice)
{
case 1: spush(); break;
case 2: sdisplay();break;
case 3: spop(); break;
;
}
}while(choice!=10);
}
case 2:
{
do
{ printf("\nQueue implementation using linked list\n");
printf("\n1. Create \n2. Display \n3. Delete \n4. Exit\n");
printf("\nEnter your choice : ");
scanf("%d",&choice);
switch(choice)
{ case 1: qinsert(); break;
case 2: qdisplay();break;
```



```c
printf("\nEnter your choice : ");
scanf("%d",&choice);
switch(choice)
{ case 1: qinsert(); break;
case 2: qdisplay();break;
case 3: qdel(); break;
}
}while(choice!=10);
}
case 3:
{
do
{
printf("3: Insert\n4: Sort\n5: Reverse\n6:Concatenate with list 1\n7: Display list\n8: Go back to main menu\n9:Exit\n");
scanf("%d", &n2);
switch(n2)
{
case 3: {
printf("Enter item to beinserted: ");
scanf("%d", &n);
head1 =
insertfront(head1, n);
break;
}
case 4: {
head1 = sort(head1);
break;
}
case 5: {
reverse(&head1);
break;
}
case 6: {
head1 =
concatenate(head1, head2);
break;
}
case 7: {
display(head1);
break;
}
```



```c
case 7: {
display(head1);
break;
}
case 8: {
flag = 1;
break;
}
case 9: {
exit(0);
}
default: printf("Invalid input.\n");
}
if(flag == 1)
{
break;
}
}while(1);
break;
}
case 4: {
flag = 0;
do
{
printf("3: Insert\n4: Sort\n5: Reverse\n6:Concatenate with list 1\n7: Display list\n8: Go back to main menu\n9:Exit\n");
scanf("%d", &n2);
switch(n2)
{
case 3: {
printf("Enter item to be inserted: ");
scanf("%d", &n);
head2 =
insertfront(head2, n);
break;
}
case 4: {
head2 = sort(head2);
break;
}
case 5: {
reverse(&head2);
```



```c
}
case 4: {
head2 = sort(head2);
break;
}
case 5: {
reverse(&head2);
break;
}
case 6: {
head2 =
concatenate(head2, head1);
break;
}
case 7: {
display(head2);
break;
}
case 8: {
flag = 1;
break;
}
case 9: {
exit(0);
}
default: printf("Invalid input.\n");
}
if(flag == 1)
{
flag = 0; break;
}
}while(1);
break;
}
case 9: exit(0);
default: printf("Invalid input.\n");
}
}while(1);
return 0;
}
```