C 3_1_singly_linked_list.c > main()

```c
/* Write a program in C to create and display a singly linked list. */

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

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

int main(){
    struct node *head = (struct node*)malloc(sizeof(struct node));
    struct node *second = (struct node*)malloc(sizeof(struct node));
    struct node *end = (struct node*)malloc(sizeof(struct node));
    head->data=1;
    head->next=second;
    second->data=2;
    second->next=end;
    end->data=3;
    end->next=NULL;
    struct node *temp=head;
    while(temp!=NULL){
        printf("%d || %u, ",temp->data,temp->next);
        temp=temp->next;
    }
    return 0;
}

```

TERMINAL COMMENTS

```
PS C:\Users\shuvr\OneDrive\Documents\College C codes\DSA-ASS-3> ^C
PS C:\Users\shuvr\OneDrive\Documents\College C codes\DSA-ASS-3>
PS C:\Users\shuvr\OneDrive\Documents\College C codes\DSA-ASS-3>  & 'c:\
WindowsDebugLauncher.exe' '--stdin=Microsoft-MIEngine-In-co5wfnjx.41s'
r22f.wcg' '--pid=Microsoft-MIEngine-Pid-qsyflz3x.yf5' '--dbgExe=C:\msys
1 || 957504, 2 || 957568, 3 || 0,
PS C:\Users\shuvr\OneDrive\Documents\College C codes\DSA-ASS-3>
```

C 3_2_insertatbeginning.c > ...

```c
/* Write a program in C to insert a new node at the beginning of a
Singly Linked List.*/

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

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

struct node *createnode(int value){
    struct node *newnode=(struct node*)malloc(sizeof(struct node));
    newnode->data=value;
    newnode->next=NULL;
    return newnode;
}

void displaylist(struct node *head){
    struct node *temp=head;
    while(temp!=NULL){
        printf("%d  ",temp->data);
        temp=temp->next;
    }
}

void insertatbeg(struct node **head,int value){
    struct node *newnode=createnode(value);
    newnode->next=*head;
    *head=newnode;
}

int main(){
    struct node *head=createnode(1);
    struct node *second=createnode(2);
    struct node *end=createnode(3);
    head->next=second;
    second->next=end;
    end->next=NULL;
    printf("List Before Insertion : ");
    displaylist(head);
    insertatbeg(&head,0);
    insertatbeg(&head,-1);
    printf("\nList After Insertion at beginning : ");
    displaylist(head);
    return 0;
}
```

```
List Before Insertion : 1  2  3
List After Insertion at beginning : -1  0  1  2  3
```

C 3_3_traverse_linked_list.c > ...

```c
/* Write a program in C to traverse in a singly linked list.*/

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

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

struct node *createnode(int value){
    struct node *newnode=(struct node*)malloc(sizeof(struct node));
    newnode->data=value;
    newnode->next=NULL;
    return newnode;
}

void traverselist(struct node *head){
    struct node *temp=head;
    while(temp!=NULL){
        printf("%d | %u ,",temp->data,temp->next);
        temp=temp->next;
    }
}

int main(){
    struct node *head=createnode(1);
    struct node *second=createnode(2);
    struct node *end=createnode(3);
    head->next=second;
    second->next=end;
    end->next=NULL;
    printf("Traversing the linked list...\nNodes of the linked list : ");
    traverselist(head);
    return 0;
}
```

TERMINAL COMMENTS

```
Traversing the linked list...
Nodes of the linked list : 1 | 7248976 ,2 | 7249040 ,3 | 0 ,
```

C 3_4_linkedlist_copy_arr.c > ...

```c
/* Write a program in C to copy the elements of the array to a singly
linked list.*/

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

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

struct node *createnode(int value){
    struct node *newnode=(struct node*)malloc(sizeof(struct node));
    newnode->data=value;
    newnode->next=NULL;
    return newnode;
}

void displaylist(struct node *head){
    struct node *temp=head;
    while(temp!=NULL){
        printf("%d || %u, ",temp->data,temp->next);
        temp=temp->next;
    }
}

```

```c
struct node *copy(int arr[],int length){
    if(length==0){
        return NULL;
    }
    struct node *head=createnode(arr[0]);
    struct node *current=head;
    for(int i=1;i<length;i++){
        current->next=createnode(arr[i]);
        current=current->next;
    }
    current->next=NULL;
    return head;
}


int main(){
    int length;
    printf("Enter length of array : ");
    scanf("%d",&length);
    int arr[length];
    printf("Enter %d numbers : ",length);
    for(int i=0;i<length;i++){
        scanf("%d",&arr[i]);
    }
    struct node *head=copy(arr,length);
    printf("\nLinked List as a copy of the given array :--\n ");
    displaylist(head);
    return 0;
}
```

TERMINAL COMMENTS

```
Enter 5 numbers : 1 2 3 4 5

Linked List as a copy of the given array :--
 1 || 7380032, 2 || 7380096, 3 || 7380160, 4 || 7380224, 5 || 0,
```

C 3_5_linkedlist_to_array.c > ...

```c
/* Write a C program that converts a singly linked list into an array and
returns it */

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

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

struct node *createnode(int value){
    struct node *newnode=(struct node*)malloc(sizeof(struct node));
    newnode->data=value;
    newnode->next=NULL;
    return newnode;
}

void displaylist(struct node *head){
    struct node *temp=head;
    while(temp!=NULL){
        printf("%d || %u, ",temp->data,temp->next);
        temp=temp->next;
    }
}

int listlength(struct node *head){
    struct node *temp=head;
    int c=0;
    while(temp!=NULL){
        c++;
        temp=temp->next;
    }
    return c;
}

```

```c
int *convert(struct node *head,int length){
    int *arr=(int *)malloc(length*(sizeof(int)));
    int index=0;
    struct node *temp=head;
    while(temp!=NULL){
        arr[index]=temp->data;
        temp=temp->next;
        index++;
    }
    return arr;
}

int main(){
    // Creating sample linked list
    struct node *head=createnode(1);
    struct node *second=createnode(2);
    struct node *third=createnode(3);
    struct node *fourth=createnode(4);
    struct node *end=createnode(5);
    head->next=second;
    second->next=third;
    third->next=fourth;
    fourth->next=end;
    end->next=NULL;
    printf("Linked List :--\n");
    displaylist(head);
    int length=listlength(head);
    int *arr=convert(head,length);
    printf("\nConverted Array :--\n");
    for(int i=0;i<length;i++){
        printf("%d  ",*(arr+i));
    }
    return 0;
}
```

TERMINAL COMMENTS

```
Linked List :--
1 || 6921280, 2 || 6921344, 3 || 6921408, 4 || 6921472, 5 || 0,
Converted Array :--
1  2  3  4  5
```