

```

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

//=====
typedef struct SinhVien
{
    char ma[11];
    char hoten[41];
    float dtb;
}SV;
//=====
typedef struct node{
    SV info;
    node* pNext;
}Node;
//=====
typedef struct list{
    Node* pHead;
    Node* pTail;
}List;
//=====
void NhapN(int &n)
{
    do
    {
        printf("nhap so luong sinh vien (0<N): ");
        scanf("%d",&n);
        if( n<1 ) printf("Nhap sai\n");
    }while( n<1 );
}
//=====
void Nhap1SV(SV &x)
{
    printf("nhap ma sinh vien: ");
    fflush(stdin); gets(x.ma);

    printf("nhap ho ten sinh vien: ");
    fflush(stdin); gets(x.hoten);

    printf("nhap dtb sinh vien: ");
    fflush(stdin); scanf("%f",&x.dtb);
}
//=====
void TieuDe()
{
    printf("\n%-15s  %-39s %11s","MA SINH VIEN","HO TEN SINH VIEN","DTB");
    printf("\n%-15s  %-39s %11s","=====","=====","==");
}
//=====
void Xuat1SV(SV x)
{
    printf("\n%-15s  %-39s %12.2f",x.ma,x.hoten,x.dtb);
}
//=====
void Init(List &l)
{
    l.pHead=l.pTail = NULL;
}
//=====
int IsEmpty(List l)
{
    return (l.pHead==NULL) ;
}
//=====
Node* CreateNode (SV x)
{
    node* p;
    p = new Node;
    if(p == NULL)
    {
        printf("Loi cap phat vung nho!");
        getch();
        exit(0);
    }
}

```

```

        p->info = x;
        p->pNext = NULL;
        return p;
    }
//=====
void AddHead(List &l, Node* p)
{
    if(IsEmpty(l))
    {
        l.pHead=l.pTail=p;
    }
    else
    {
        p->pNext=l.pHead;
        l.pHead=p;
    }
}
//=====
void AddTail(List &l, Node* p)
{
    if(IsEmpty(l))
    {
        l.pHead=l.pTail=p;
    }
    else
    {
        l.pTail->pNext = p;
        l.pTail= p;
    }
}
//=====
void InputList(List &l)
{
    SV x;

    int n; NhapN(n);
    for(int i=0; i<n; i++)
    {
        printf("Nhap sinh vien thu %d:\n", i+1);
        Nhap1SV(x);
        Node* p=CreateNode(x);
        AddTail(l, p); // them node vao cuoi DS
    }
}
//=====
void ReadFile(const char* filename, List &l)
{
    FILE *f= fopen(filename, "rt");
    if (f==NULL)
    {
        printf("\nKhong mo duoc file\n");
        getch();
        exit(0);
    }

    SV x;
    int n;
    fscanf(f,"%d\n",&n);
    for(int i=0; i<n; i++)
    {
        fscanf(f,"%s ",&x.ma);
        fscanf(f,"%f",&x.dtb);
        fgets(x.hoten, 40, f);
        x.hoten[strlen(x.hoten)-1] = '\0';

        Node* p=CreateNode(x);
        if(p) AddTail(l, p);
    }
    fclose(f);
}
//=====
void OutputList(List l)
{
    TieuDe();
    for (Node* i = l.pHead; i!=NULL; i = i->pNext)
        Xuat1SV(i->info);
}

```

```

//=====
void swap(SV &x, SV &y)
{
    SV t = x; x = y; y = t;
}
//=====
void InterchangeSort_Giam_Hoten(List &l)
{
    for (Node* i = l.pHead; i->pNext!=NULL; i = i->pNext)
        for (Node* j = i->pNext; j!=NULL; j = j->pNext)
            if(stricmp(i->info.hoten, j->info.hoten)<0)
                swap(i->info.j->info);
}
//=====
void SelectionSort_Tang_MaSV(List &l)
{
    for (Node* i = l.pHead; i->pNext!=NULL; i = i->pNext)
    {
        Node* vmin = i;
        for (Node* j = i->pNext; j!=NULL; j = j->pNext)
            if(stricmp(vmin->info.ma, j->info.ma)>0)
                vmin = j;
        swap(vmin->info, i->info);
    }
}
//=====
Node* TimMaSV(List l, char maX[])
{
    for(Node* i=l.pHead; i!=NULL; i=i->pNext)
        if(stricmp(i->info.ma, maX )==0)
            return i;

    return NULL;
}
//=====
void menu(int &chon)
{
    printf("\n\n=====MENU=====");
    printf("\n 1. InterchangeSort GIAM HOTEN");
    printf("\n 2. SelectionSort TANG MA SV");
    printf("\n 3. Tim SV co MA X");

    printf("\n\n 0. Thoat");
    printf("\n=====");
    printf("\n\n Ban chon cong viec: "); scanf("%d", &chon);
}
//=====
int main()
{
    List l;

    Init(l);

    //    InputList(l);
    //    printf("\nDanh sach lien ket vua nhap: \n");
    //    OutputList(l);

    ReadFile("d:/sinhvien.txt", l);
    printf("\nDanh sach lien ket doc tu file: \n");
    OutputList(l);

    char maX[11];
    Node* pX;
    int chon;
    do{
        menu(chon);
        switch(chon)
        {
            case 1:
                InterchangeSort_Giam_Hoten(l);
                printf("\n\n\t\t=====LIST Interchange Sort GIAM HOTEN=====\\n\\n");
                OutputList(l);
                break;

            case 2:
                SelectionSort_Tang_MaSV(l);
                printf("\n\n\t\t=====LIST Selection Sort TANG MA SV=====\\n\\n");

```

```

        OutputList(l);
        break;

    case 3:
        printf("\n\n Nhap Ma SV can tim: ");
        fflush(stdin); gets(maX);
        pX = TimMaSV(l, maX);
        if(pX==NULL)        printf("\n Khong tim thay MaX: %s", maX);
        else
        {
            printf("\nThong tin SV duoc tim thay:\n");
            TieuDe();
            Xuat1SV(pX->info);
        }
        break;

    default: chon=0;

    }
}while(chon!=0);

return 0;

}

```