```c
// Bai toan cai ba lo 1

// Moi do vat co so luong khong han che

// Giai bang phuong phap NHANH CAN


#include <stdio.h>

#include <malloc.h>

#include <string.h>

#define MAX 100


typedef struct {

        char TenDV[20];

        float TL, GT;

        int PA;

} DoVat;


DoVat * dsdv; // Danh sach cac do vat (danh sach dong)

int n; // luu so luong do vat

int x[MAX]; // Luu phuong an tot nhat tam thoi

float W; // Luu trong luong cua Ba lo

float CT; // Luu can tren

float TGT; // Luu Tong gia tri cua cac vat da duoc chon tai moi nut

float GiaLNTT; // Luu Gia lon nhat tam thoi

float TLConLai; // Luu Trong luong con lai cua Ba lo tai moi nut
```

```c
DoVat * ReadFromFile(float *W, int *n){

    FILE *f;

    f=fopen("balo1-nhanhcan.INP", "r");

    fscanf(f, "%f", W); // Xac dinh trong luong Ba lo

    DoVat *dsdv;

    dsdv=(DoVat*)malloc(sizeof(DoVat));

    int i=0;

    while (!feof(f)){

        fscanf(f, "%f%f",&dsdv[i].TL,&dsdv[i].GT);

        fgets(dsdv[i].TenDV,20,f);

        dsdv[i].TenDV[strlen(dsdv[i].TenDV)-1]='\0';

        dsdv[i].PA=0;

        i++;

        dsdv=(DoVat*)realloc(dsdv, sizeof(DoVat)*(i+1));

    }

    *n=i;

    fclose(f);

    return dsdv;

}


void swap(DoVat *x, DoVat *y){

    DoVat Temp;
```

```c
        Temp = *x;

        *x = *y;

        *y = Temp;

}


void BubbleSort(DoVat *dsdv, int n){
        int i,j;
        for(i=0; i<=n-2; i++)
                for (j=n-1; j>=i+1; j--){
                        float DGJ = dsdv[j].GT/dsdv[j].TL;
                        float DGJ_1 = dsdv[j-1].GT/dsdv[j-1].TL;
                        if (DGJ > DGJ_1)
                                swap(&dsdv[j],&dsdv[j-1]);
                }
}


void InDSDV(DoVat *dsdv ,int n, float W){
        int i;
        float TongTL = 0.0, TongGT = 0.0;
        printf("|---|--------------------|---------|---------|---------|---------|\n");
        printf("|%-3s|%-20s|%-9s|%-9s|%-9s|%-9s|\n", "STT", " Ten  Do  Vat ","T.Luong", "Gia Tri", "Don Gia", "P. An");
        printf("|---|--------------------|---------|---------|---------|---------|\n");
```

```c
for(i=0;i<n;i++){

        printf("|%-3d",i+1);

        printf("|%-20s",dsdv[i].TenDV);

        printf("|%-9.1f",dsdv[i].TL);

        printf("|%-9.1f",dsdv[i].GT);

        printf("|%-9.1f",dsdv[i].GT/dsdv[i].TL);

        printf("|%-9d|\n",dsdv[i].PA);

        TongTL=TongTL+dsdv[i].PA * dsdv[i].TL;

        TongGT=TongGT+dsdv[i].PA * dsdv[i].GT;

    }

    printf("|---|--------------------|---------|---------|---------|---------|\n");

    printf("Trong luong cua ba lo= %9.1f\n",W);

    printf("Tong  trong  luong=  %9.1f,  Tong  gia  tri=  %9.1f\n",  TongTL,
    TongGT);

}


// Tinh cac dai luong tai nut goc

void init(){

    TLConLai = W;

    CT = TLConLai*dsdv[0].GT/dsdv[0].TL; // Can tren cua nut goc

    GiaLNTT = 0.0;

    TGT = 0.0;

}
```

```
//Ghi nhan phuong an tot nhat tam thoi

void GhiNhanKyLuc(){

        int i;

        if(GiaLNTT < TGT){

                GiaLNTT = TGT;

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

                        dsdv[i].PA=x[i];

        }

}


void Try(int i){

        int j; // j la so vat duoc chon

        for(j = TLConLai/dsdv[i].TL; j>=0; j--){

                TGT = TGT + j*dsdv[i].GT;

                TLConLai = TLConLai - j*dsdv[i].TL;

                CT = TGT + TLConLai*dsdv[i+1].GT/dsdv[i+1].TL;

                if(CT>GiaLNTT){ // Chua cat tia

                        x[i]=j;

                        if((i==n-1)||(TLConLai==0)) // Xet het tat ca cac do vat hoac
        da day ba lo

                                GhiNhanKyLuc();

                        else
```

```c
                    Try(i+1); //Xet nut con cua nut i

            }

        // Quay lui xet

        x[i] = 0;

        TGT = TGT - j*dsdv[i].GT;

        TLConLai = TLConLai + j*dsdv[i].TL;

        }

}


int main(){

        dsdv = ReadFromFile(&W, &n);

        BubbleSort(dsdv,n);

        init();

        Try(0);

        InDSDV(dsdv,n,W);

        free(dsdv);

        return 0;

}
```