

Thuật toán Tham ăn : *Bài toán trả tiền của máy ATM*

Yêu cầu: Cài đặt bài toán trả tiền của máy ATM bằng thuật toán Tham ăn, với cách trả tiền bằng các tờ tiền giấy mệnh giá hiện tại đang lưu hành ở nước ta (1000, 2000, 5000, 10000, 20000, 50000, 100000, 200000, 500000).

// Bai toan tra tien cua may ATM

// Du lieu cho trong file D://PT_TKTT/Giao trinh moi/thuc hanh/ATM.INP

// Giai bang phuong phap THAM AN

```
#include <stdio.h>
```

```
#include <malloc.h>
```

```
#include <string.h>
```

```
typedef struct {
```

```
    char TenTien[25];
```

```
    int MG, PA;
```

```
} Tien;
```

```
Tien * ReadFromFile(int *n){
```

```
    FILE *f;
```

```
    f=fopen("D:\\PTTKTT\\BTThuchanh\\ATM.INP", "r");
```

```
    Tien *ds1t;
```

```
    ds1t=(Tien*)malloc(sizeof(Tien));
```

```
    int i=0;
```

```

while (!feof(f)){
    fscanf(f, "%d",&dslt[i].MG);
    fgets(dslt[i].TenTien,25,f);
    dslt[i].TenTien[strlen(dslt[i].TenTien)-1]='\0';
    dslt[i].PA=0;
    i++;
    dslt=realloc(dslt, sizeof(Tien)*(i+1));
}
*n=i;
fclose(f);
return dslt;
}

```

```

void Swap(Tien *x, Tien *y){
    Tien Temp;
    Temp = *x;
    *x = *y;
    *y = Temp;
}

```

// Sap xep theo thu tu tang cua Don gia

// Don gia = GiaTri/ Trongluong

```

void BubbleSort(Tien *dslt, int n){
    int i,j;

```

```

for(i=0; i<=n-2; i++)
    for (j=n-1; j>=i+1; j--){
        if (dslt[j].MG>dslt[j-1].MG)
            Swap(&dslt[j],&dslt[j-1]);
    }
}

```

```

void InDS(Tien *dslt ,int n, int TienCanRut){
    int i;
    int TongTienTra=0;
    printf("---|-----|-----|-----|-----\n");
    printf("|%-3s|%-25s|%-9s|%-9s|%-10s|\n", "STT", "    Loai tien  ", "Menh Gia", "So to", "Thanh tien");
    printf("---|-----|-----|-----|-----\n");
    for(i=0;i<n;i++){
        printf("|%-3d",i+1);
        printf("|%-25s",dslt[i].TenTien);
        printf("|%-9d",dslt[i].MG);
        printf("|%-9d",dslt[i].PA);
        printf("|%-10d|\n",dslt[i].MG*dslt[i].PA);
        TongTienTra=TongTienTra+dslt[i].PA * dslt[i].MG;
    }
    printf("---|-----|-----|-----|-----\n");
    printf("So tien can rut= %9d\n",TienCanRut);
}

```

```

        printf("So tien da tra= %9d\n", TongTienTra);
    }

void Greedy(Tien *dslt,int n, int TienCanRut){
    int i=0;
    while(i<n&&TienCanRut>0) {
        dslt[i].PA= TienCanRut/dslt[i].MG;
        TienCanRut = TienCanRut-dslt[i].PA * dslt[i].MG;
        i++;
    }
}

int main(){
    int n;
    int TienCanRut;
    printf("Nhap so tien can rut: "); scanf("%d",&TienCanRut);
    Tien *dslt;
    dslt=ReadFromFile(&n);
    BubbleSort(dslt,n);
    Greedy(dslt,n,TienCanRut);
    InDS(dslt,n,TienCanRut);
    free(dslt);
    return 0;
}

```

// Bai toan tra tien cua may ATM - 2

```
#include <stdio.h>
```

```
#include <math.h>
```

```
#define MAX 200
```

```
void ATM(int n){
```

```
    int a[9];
```

```
    a[0] = 500000;
```

```
    a[1] = 200000;
```

```
    a[2] = 100000;
```

```
    a[3] = 50000;
```

```
    a[4] = 20000;
```

```
    a[5] = 10000;
```

```
    a[6] = 5000;
```

```
    a[7] = 2000;
```

```
    a[8] = 1000;
```

```
    int b[9];
```

```
    for (int i=0; i<9; i++){
```

```
        b[i] = MAX;
```

```
    } //So to tien con lai
```

```
    int m[9]; //So to tien rut ra
```

```
    int i = 0;
```

```
    if (n!=0 && b[i]!=0)
```

```

        for (i=0; i<9; i++){
            m[i] = n/a[i];
            if (m[i] > b[i]) m[i] = b[i];
            n = n - m[i]*a[i];
            b[i] = b[i] - m[i];
        }
    if (n==0)
        for (i=0; i<9; i++){
            if (m[i] != 0) printf("%d to %d.\n",m[i],a[i]);
        }
    else printf("\nGiao dich khong thanh cong.");
}

main(){
    int n;
    printf("Ban muon rut bao nhieu? ");
    scanf("%d",&n);
    ATM(n);
}

```