

Draw the “map” of used memory (both static and dynamic memory) in following cases, and write the code for initializing the structure and allocate dynamic memory where necessary. Case 1 is given as example.

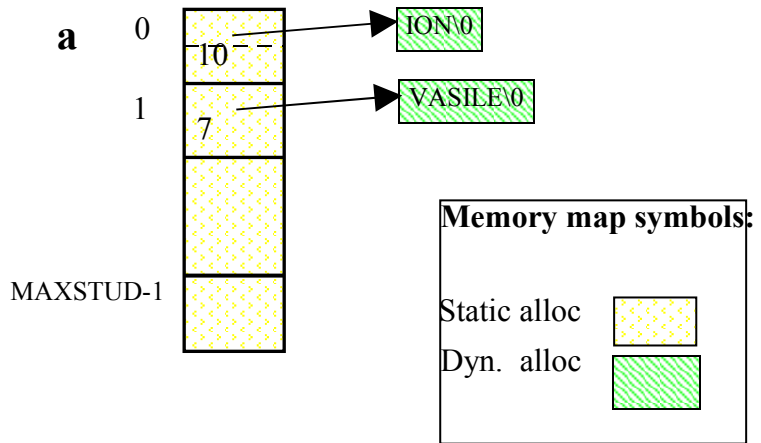
**CASE 1:** // array of structures

```
#define MAXSTUD 20
struct student {
    char *name;
    float mark;
};
```

```
struct student a[MAXSTUD];
int nstud;
```

Initialization of data structure:

```
int i;
char buf[21];
scanf("%i",&nstud);
for (i=0; i<nstud; i++) {
    scanf("%i",&a[i].mark);
    scanf("%20s",buf);
    a[i].name=(char*)malloc(strlen(buf)+1);
    strcpy(a[i].name, buf);
}
```

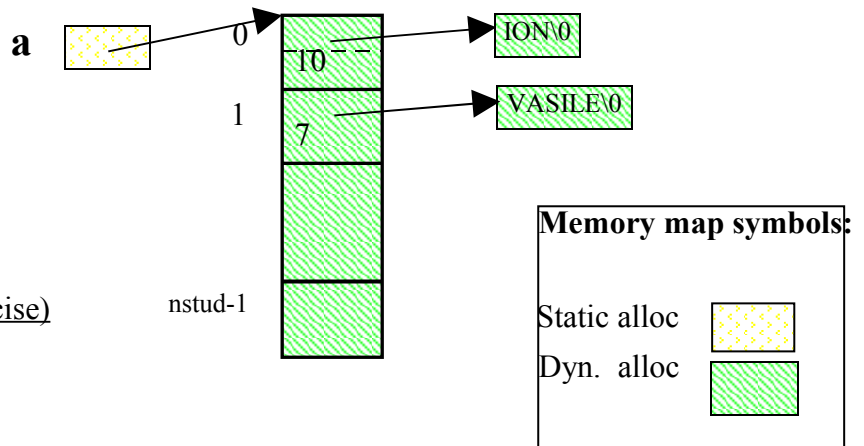


**CASE 2:** // dynamically allocated array of structures

```
struct student {
    char *name;
    float mark;
};
```

```
struct student *a;
int nstud;
```

Initialization of data structure: (exercise)



**CASE3:** // array of pointers to structures

```
struct student {  
    char *name;  
    float mark;  
};
```

Memory map: (exercise)

```
struct student * a[MAXSTUD];  
int nstud;
```

Initialization of data structure:

**CASE 4:** // dynamically allocated array of pointers to structures

```
struct student {  
    char *name;  
    float mark;  
};
```

Memory map: (exercise)

```
struct student ** a;  
int nstud;
```

Initialization of data structure: