

C 기초 프로그래밍 교육

Week 6. Dynamic Memory Allocation

| 교육 구성

INDEX

1. malloc

malloc(memory allocation)

동적 메모리 할당
왜 필요할까?

malloc(memory allocation)

```
#include <stdio.h>

int main()
{
    int n;
    scanf("%d", &n);

    int arr[n];
    for(int i = 0; i < n; i++)
        arr[i] = 1;

    for(int j = 0; j < n; j++)
        printf("%d\n", arr[j]);
}
```

```
minibeef@argos-edu:~/cedu/week6$ ./ex1
4
1
1
1
1
```

이 코드 돌아갈까?

malloc(memory allocation)



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Updated October 13, 2018 · Author has **781** answers and **2.9M** answer views

You can only do that in C99 [variable-length arrays](#) ↗

```
1 void somefunc(int size)
2 {
3     int vla[size];
4     // do something with vla
5 } // vla is automatically destroyed when out of scope
```

Note that the array will be created on stack so you need to take care about the length, otherwise stack overflow will occur.

Before C99 you need to use `malloc` and `free` to allocate and delete memory explicitly.

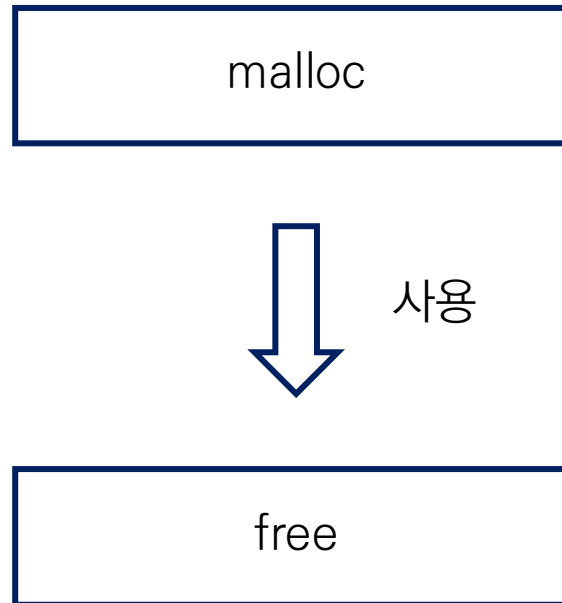
```
int *vla = malloc(size*sizeof(int));
```

In some compilers you can use `alloca` to achieve the exact result as C99's VLA but it must be used with care just like VLA as above. See [Why is the use of `alloca`\(\) not considered good practice?](#) ↗

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하지만, malloc을 사용하면 메모리를 '해제' 할 수 있기 때문에
써야하는 이유가 충분

malloc(memory allocation)

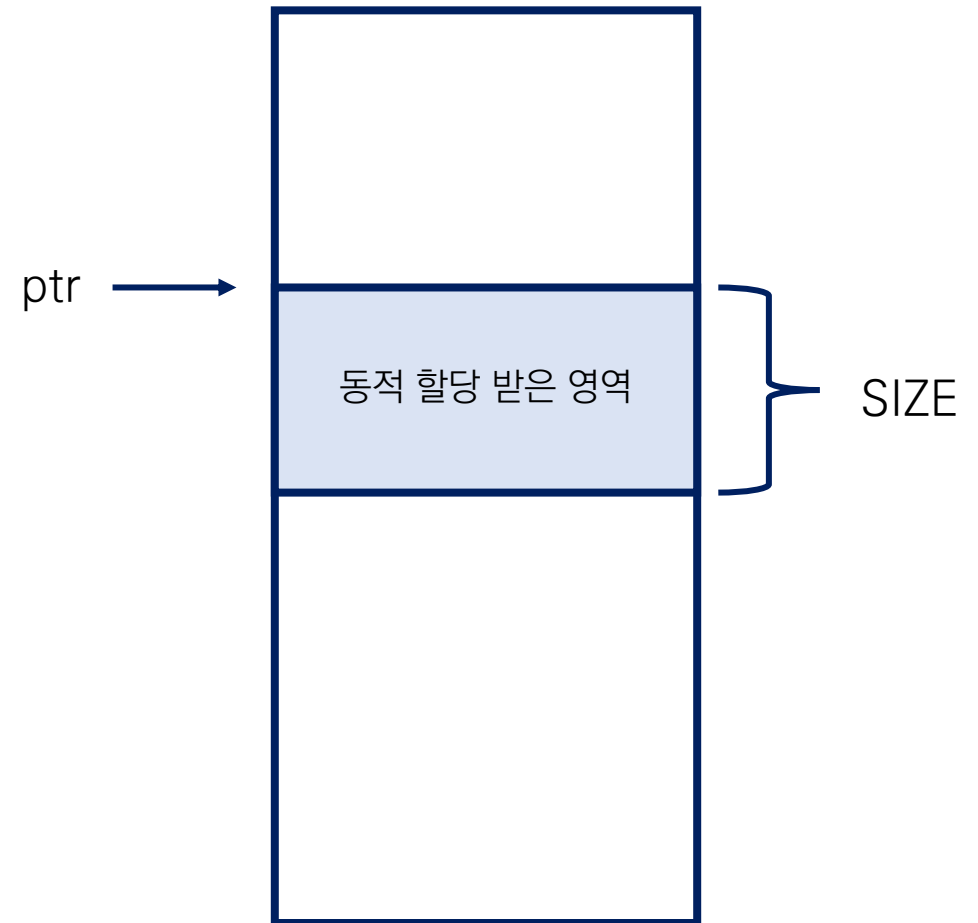


malloc(memory allocation)

```
int* ptr = (int) malloc (SIZE)
```

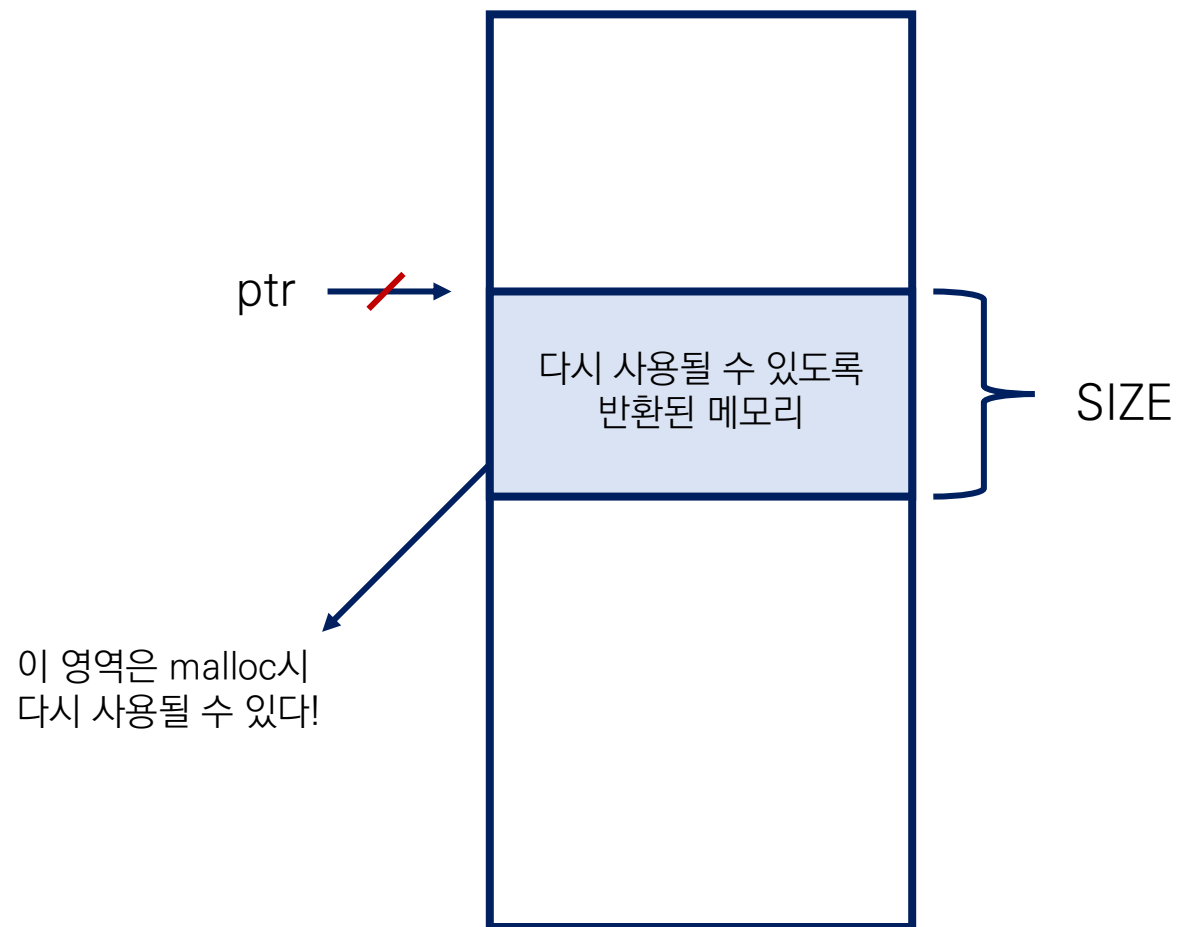
malloc(memory allocation)

```
int* ptr = (int) malloc (SIZE);
```



malloc(memory allocation)

free(ptr);



malloc(memory allocation)

```
#include <stdio.h>

int main()
{
    int* ptr;
    ptr = (int *) malloc (sizeof(int) * 3);

    for(int i = 0; i < 3; i++)
        *(ptr + i) = i;

    for(int j = 0; j < 3; j++)
        printf("%d\n", *(ptr + j));

    free(ptr);
}
```

```
minibeef@cargos-edu:~/cedu/week6$ ./ex2
0
1
2
3
```

malloc(memory allocation)

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

int main()
{
    int num;
    int* ptr;

    printf("숫자 몇개? : ");
    scanf("%d", &num);

    메모리 동적 할당
    for(int i = 0; i < num; i++) {
        printf("%d번째 입력 : ", i + 1);
        scanf("%d", 입력);
    }

    for(int j = 0; j < num; j++)
        printf("%d ", 출력);

    free(ptr);
}
```

```
minibee@argos-edu:~/cedu/week6$ ./prac1
숫자 몇개? : 5
1번째 입력 : 5
2번째 입력 : 4
3번째 입력 : 3
4번째 입력 : 2
5번째 입력 : 1
5 4 3 2 1 minibee@argos-edu:~/cedu/week6$
```

끝