

Naming (IV)

A Dynamic Memory Allocation Example

- Q: If the size of an array is unknown till runtime, how do you create an array in C?
- A: Dynamic memory allocation (malloc); Programmers control the lifetime of this type of memory
- Example: A Dog struct including name and age. But the name and age of an instance is read from the command line.
- Remember to free the allocated memory before the end of the program.

```
//  
// DogStruct.c  
//  
//  
  
#include <stdio.h>  
#include <stdlib.h>  
#include <string.h>  
  
typedef struct {  
    char *name;  
    int age;  
} Dog;  
  
Dog *create_dog (char *nm, int a) {  
    Dog *dog = (Dog*)malloc(sizeof(Dog));  
    dog->name = (char*)malloc(sizeof(*nm));  
  
    strcpy(dog->name, nm);  
    dog->age = a;  
  
    return dog;  
}  
  
void remove_dog (Dog *dog) {  
    free(dog->name);  
    free(dog);  
  
    return;  
}  
  
int main (int argc, char **argv) {  
    if (argc <= 2) {  
        printf("Usage: ./a.out age name\n");  
        return 0;  
    }  
  
    Dog *dog = create_dog(argv[2], atoi(argv[1]));  
  
    printf("%s is %d years old\n", dog->name, dog->age);  
  
    remove_dog(dog);  
  
    return 0;  
}
```