

프로그래밍 나두 할 수 있다!

**I CAN DO PROGRAMMING**

...

여섯번째 모임

~Sixth Meeting~

# 오늘의 주제

- Malloc
  - Calloc?
  - 둘의 차이점?
  - Free
  - Sizeof
- Structure
  - Typedef
- Segmentation Fault
- Linked List
  - Array와의 차이점?
- 예제 코드!
  - 코딩타임~

# Malloc

```
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <string.h>
4
5
6  int main () {
7      char *str;
8
9      /* Initial memory allocation */
10     str = (char *) malloc(15);
11     strcpy(str, "I can do ");
12     printf("String = %s, Address = %u\n", str, str);
13
14     /* Reallocating memory */
15     str = (char *) realloc(str, 25);
16     strcat(str, "Computer Programming!");
17     printf("String = %s, Address = %u\n", str, str);
18
19     free(str);
20
21     return(0);
22 }
```

음.. 만약에 str이  
15 글자 이상이면  
어떡하죠?

같이  
고쳐봅시다!

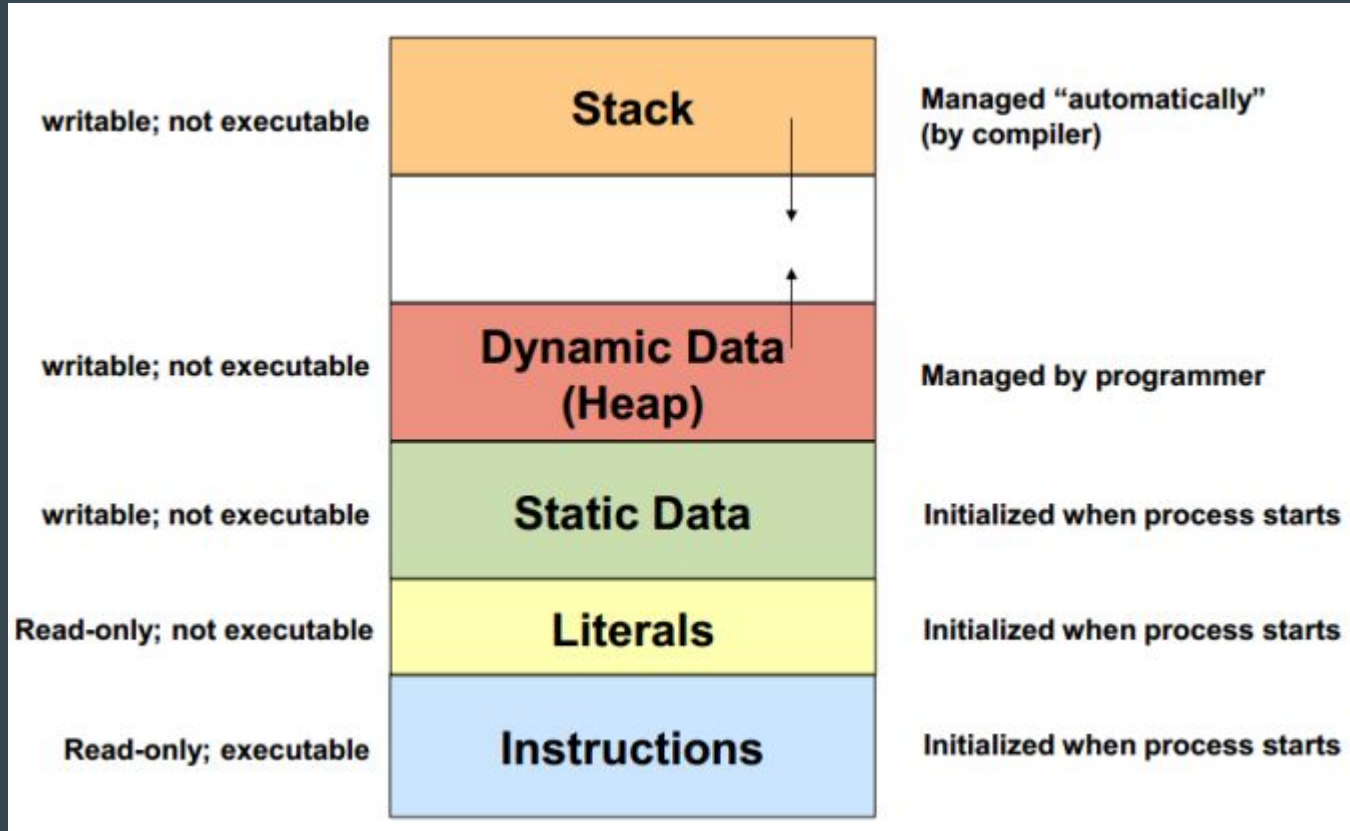
# Calloc

요즘엔 많이 쓰이지 않아요

Malloc과 calloc  
둘의 차이점이 무엇일까요?

```
1  /* calloc example */
2  #include <stdio.h>      /* printf, scanf, NULL */
3  #include <stdlib.h>     /* calloc, exit, free */
4
5  int main ()
6  {
7      int i,n;
8      int * pData;
9      printf ("Amount of numbers to be entered: ");
10     scanf ("%d",&i);
11     pData = (int*) calloc (i,sizeof(int));
12     if (pData==NULL) exit (1);
13     for (n=0;n<i;n++)
14     {
15         printf ("Enter number #%d: ",n+1);
16         scanf ("%d",&pData[n]);
17     }
18     printf ("You have entered: ");
19     for (n=0;n<i;n++) printf ("%d ",pData[n]);
20     free (pData);
21     return 0;
22 }
```

# Free( )



# Free( )

가능할까요?

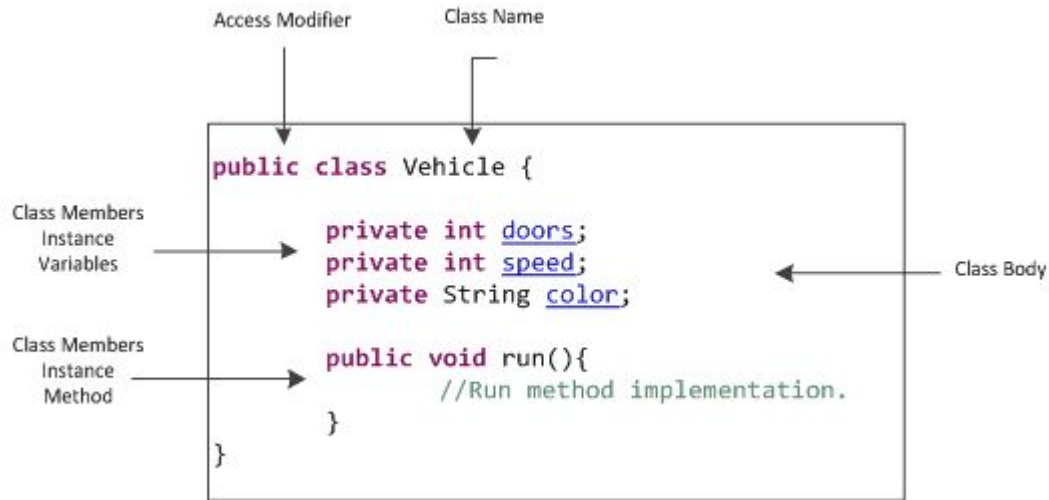
```
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <string.h>
4
5
6  int main () {
7      int i = 10;
8      int *ptr = &i;
9      int *ptr2 = ptr;
10
11
12      printf("%d %d\n", *ptr, *ptr2);
13
14      free(ptr);
15      printf("%d\n", *ptr2);
16
17      return(0);
18  }
```

# Segmentation Fault

<https://www.geeksforgeeks.org/core-dump-segmentation-fault-c-cpp/>

# Structure

Java에서 Class Object와 비슷!





# Structure

[https://www.tutorialspoint.com/cprogramming/c\\_structures.htm](https://www.tutorialspoint.com/cprogramming/c_structures.htm)

# Segmentation Fault



# Linked List

Understanding and implementing a Linked List in C and Java



만약에 5개보다 더  
많이 값을 입력하고  
싶으면 어떻게하죠??

```
int main() {  
    int values[5];  
    values[2] = 45;  
    // values[100000] = values[2];  
}
```

Int values[100000]??

20 bytes

45



<https://www.youtube.com/watch?v=VOpjAHCee7c>

# Linked List

Understanding and implementing a Linked List in C and Java



```
int main() {  
    int *values = malloc(40);  
    values[2] = 45;  
    int x = values[2];  
    values = realloc(values, 20000*sizeof(int));  
    x = values[600];  
}
```



# Linked List



12



4



I must create a Person and each Person should have a Fridge. Is this the best way of doing it? If so what am I doing wrong? Thanks in advance.

```
typedef struct {  
    int age;  
    struct FRIDGE fridge;  
} PERSON;
```

```
typedef struct {  
    int number;  
} FRIDGE;
```

```
FRIDGE fr;  
fr.number=1;
```

```
PERSON me;  
me.name=1;  
me.fridge = fr;
```

This gives me the following error:

error: field 'fridge' has incomplete type

코딩을 다같이 해봅시다!

# Reference

- [https://www.tutorialspoint.com/cprogramming/c\\_structures.htm](https://www.tutorialspoint.com/cprogramming/c_structures.htm)
- [https://www.tutorialspoint.com/c\\_standard\\_library/c\\_function\\_malloc.htm](https://www.tutorialspoint.com/c_standard_library/c_function_malloc.htm)
- <http://www.cplusplus.com/reference/cstdlib/calloc/>
- <https://stackoverflow.com/questions/29444971/correct-usage-of-free-function-in-c>
- <http://cslibrary.stanford.edu/105/LinkedListProblems.pdf>
- <https://www.youtube.com/watch?v=VOpjAHCee7c>