Practice 9

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1.
```
#include <stdio.h>
#include <stdlib.h>

#define PRINT_DELIMITER() printf("------------------------\n");
#define PRINT_MEM_SEG(seg, addr) printf("[%s]: %p\n", seg, addr);

static void func(void)
{
    printf("hello\n");
}

int main(int argc, char *argv[])
{
    PRINT_DELIMITER();
    PRINT_MEM_SEG("CMD LINE ARGS", &argv[0]);

    int stack_var = 25;
    PRINT_DELIMITER();
    PRINT_MEM_SEG("STACK", &stack_var);

    int *heap_ptr = malloc(sizeof(int));
    PRINT_DELIMITER();
    PRINT_MEM_SEG("HEAP", heap_ptr);

    static int data_var = 10;
    PRINT_DELIMITER();
    PRINT_MEM_SEG("DATA", &data_var);
```

```
    PRINT_DELIMITER();

    PRINT_MEM_SEG("TEXT", func);


    return 0;

}
```

main.c

```c
int main(int argc, char *argv[])
{
    PRINT_DELIMITER();
    PRINT_MEM_SEG("CMD LINE ARGS", &argv[0]);

    int stack_var = 25;
    PRINT_DELIMITER();
    PRINT_MEM_SEG("STACK", &stack_var);

    int *heap_ptr = malloc(sizeof(int));
    PRINT_DELIMITER();
    PRINT_MEM_SEG("HEAP", heap_ptr);

    static int data_var = 10;
    PRINT_DELIMITER();
    PRINT_MEM_SEG("DATA", &data_var);

    PRINT_DELIMITER();
    PRINT_MEM_SEG("TEXT", func);

    return 0;
}
```

input

```
[DATA]: 0x5939aaad4010
------------------------
[TEXT]: 0x5939aaad11a9
```

2. #include <unistd.h>

```
#include <stdio.h>


int main(int argc, char *argv[]){

    int *currentBreak = sbrk(0);

    printf("%p\n", currentBreak);
```

}

main.c

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

int main(int argc, char *argv[]){
    int *currentBreak = sbrk(0);
    printf("%p\n", currentBreak);
}
```

input

```
0x651ed34f3000


...Program finished with exit code 0
Press ENTER to exit console.
```

3. #include <unistd.h>

#include <stdio.h>

int main(int argc, char *argv[]){

void *currentBreak = sbrk(0x5);

printf("First increment of 0x5: %p\n", currentBreak);

currentBreak = sbrk(0x5);

printf("Second increment of 0x5: %p\n", currentBreak);

currentBreak = sbrk(0x5);

printf("Third increment of 0x5: %p\n", currentBreak);

currentBreak = sbrk(0x5);

```
    printf("Fourth increment of 0x5: %p\n", currentBreak);


    currentBreak = sbrk(0x5);

    printf("Fifth increment of 0x5: %p\n", currentBreak);

}
```

main.c

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

int main(int argc, char *argv[]){
    void *currentBreak = sbrk(0x5);
    printf("First increment of 0x5: %p\n", currentBreak);

    currentBreak = sbrk(0x5);
    printf("Second increment of 0x5: %p\n", currentBreak);

    currentBreak = sbrk(0x5);
    printf("Third increment of 0x5: %p\n", currentBreak);

    currentBreak = sbrk(0x5);
    printf("Fourth increment of 0x5: %p\n", currentBreak);

    currentBreak = sbrk(0x5);
    printf("Fifth increment of 0x5: %p\n", currentBreak);
}
```

input

```
Third increment of 0x5: 0x565144253005
Fourth increment of 0x5: 0x56514425300a
Fifth increment of 0x5: 0x56514425300f
```