HW#3
Advanced Operating Systems, Spring 2023

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1. First, write a simple program called null.c that creates a pointer to an integer, sets it to NULL, and then tries to dereference it. Compile this into an executable called null. What happens when you run this program?

   Solution: Please refer to List 1 (null.c):

   Listing 1: null.c

```c
/*
First, write a simple program called null.c that creates a pointer
to an integer, sets it to NULL, and then tries to dereference it.
Compile this into an executable called null. What happens when you
run this program?
*/

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

int main()
{
    int *p = NULL;
    printf("Start\n");
    printf("The address of p is %p\n", p);
    printf("The value of p is %d\n", *p);
    printf("End\n");
    return 0;
}
```

   Its execution results are as follows:

```
Start
Segmentation fault (core dumped)
```

   As we can see the program is terminated with a segmentation fault.

   So we know that if a variable doesn't allocated memory space, it will cause a segmentation fault when it is dereferenced.

   But if we need to reference it. It's ok to reference it.