CMPE 312 - Operating Systems

Exercise 5C (Tuesday 14-16)

Q1-) Please firstly try to make a guess for each line's results, then check your guesses with the result of the program.

```c
#include <stdio.h>
int main()
{
   int* ptr, x;

   x = 30;
   printf("%u\n", &x);
   printf("%d\n\n", x);

   ptr = &x;
   printf("%u\n", ptr);
   printf("%d\n\n", *ptr);

   x = 45;
   printf("%u\n", ptr);
   printf("%d\n\n", *ptr);

   *ptr = 4;
   printf("%u\n", &x);
   printf("%d\n\n", x);
   return 0;
}
```

Q2-) In this question, there is a struct called as node, and using this struct there is a function called as BuildElements. You are expected to implement a function that returns the length of this list of nodes. After that, you also need to test this function's result.

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

struct node {
 int data;
struct node* next;
};
/*
 Build the list {1, 2, 3} in the heap and store
 its head pointer in a local stack variable.
 Returns the head pointer to the caller.
*/
struct node* BuildElements() {
struct node* head = NULL;
struct node* second = NULL;
struct node* third = NULL;
head = malloc(sizeof(struct node)); // allocate 3 nodes in the heap
second = malloc(sizeof(struct node));
third = malloc(sizeof(struct node));
head->data = 1; // setup first node
head->next = second; // note: pointer assignment rule
second->data = 2; // setup second node
second->next = third;
third->data = 3; // setup third link
third->next = NULL;
// At this point, the linked list referenced by "head"
// matches the list in the drawing.
return head;
}
```

```c
/*
 Given a linked list head pointer, compute
 and return the number of nodes in the list.
*/
int Length(struct node* head) {
struct node* current = head;
int count = 0;
/*YOU NEED TO FILL IN HERE. */
return count;
}
int main(void) {
  return 0;
}
```