HW #11: Pointers

Due dates: Sunday April 3rd, 11:59 pm through Handin (https://secure.cse.msu.edu/handin)

Lab Assignment

Using Pointers

Create a program pointerTester.c to experiment with pointers. Implement the following steps:

1. Declare three integer variables a, b and c. Initialize them to 0, 100 and 225
2. Print the value of each variable and its address.
3. Add the following declaration to your code:
   int *pA = &a, *pB = &b, *p;
4. Print the value of each pointer and the value it points to. What is the value of (*p)?
5. Print the value of each pointer and the value it points to using the "%p" specifier.
6. Run your program multiple times. Does any of the values *pA, *pB or *p change? Does any of the values pA, pB or p change?
7. Change the value that p points to to 50.
8. Set p to point to a;
9. Find 3 different ways to change the value of a to 92;
10. Add the following to your code:

```
p = pA;
*p = 22;
p = pB;
*p = 18;
p = &b;
*p = 108;
p = pA;
*p = 2;
*p = &a;
```

11. What is the effect of the previous statements? Verify by printing the values of p, pA, pB, *p, *pA, *pB, a, b, &a, &b after every step.
12. Declare an array z of 10 integers and initialize its elements to 0, 1, 2, ….
13. Print the address of each element in the array
14. Print the values of z, (z+1), (z+2), …., (z+12).
15. Add the following: *(z+3)++. What does this statement do?
16. Add the following: int * t = z;
17. Print t, t+1, t+2, t+3, t+4.
18. Set t to t+5. Print t, *t.

Palindrome

A palindrome is a string that reads the same both forward and backward. For example, "tacocat" and "C" are palindromes, "cat" is not.

Write a function isPalindrome that takes a string as parameter and returns 1 if the string is a palindrome and 0 otherwise. Your function must take char *str as a parameter. You should not input the length of the string as a second parameter. The end of the string should be detected as the character '\0'.

Write another function isPalindromeFlexible to test if a string is a palindrome ignoring blanks and case mismatch in the matching process. Under these rules, "Anna", "Ott   o" are palindromes.

Write a program pal.c to test both functions you wrote. Your program should initialize the strings listed in the table below and run isPalindrome and isPalindromeFlexible on each of them. Your program should fill and print the following table, listing each string and the result of the functions on it: (□ represents a space)

String	isPalindrome	isPalindromeFlexible
Ott□□□o	NO	YES
tacocat		
Mirror		
123 3 2 1		
A Santa lived as a devil at NASA		
anna_bob		
□C		
□C□		

Submit pal.c and pointerTester.c to Handin.

Handin

The "handin" system has options to allow you to review your files online and to download them. You Should always verify that you submitted the correct files and they were received by the handin system. You can submit files as many times as you like for a particular assignment. Handin will only keep the last version of each file. Remember to submit your files prior to the deadline as you won't be able to use handin if the deadline has passed.