CSC 455 - Assignment 5

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February 25, 2022

1 Two-Way Parameters

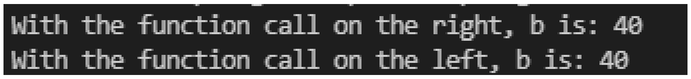
The following C code was ran on a Windows 10 computer, compiled with GCC 10.3 using the MinGW project.

```c
int* fun(int* a) {
    *a += 10;
    return a;
}

int main() {
    int a, b;
    a = 10;
    b = a + *fun(&a);
    printf("With the function call on the right,");
    printf(" b is: %d\n", b);

    a = 10;
    b = *fun(&a) + a;
    printf("With the function call on the left,");
    printf(" b is: %d\n", b);
}
```

The purpose here is to determine when the parameter a has its value fetched for the addition operation, and if there is any difference in calling a function that modifies its value before or after the initial reference. The results are shown below:



```
With the function call on the right, b is: 40
With the function call on the left, b is: 40
```

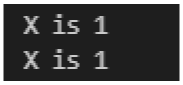
As can be seen, the function fun is ran prior to any operations taken place in the assignment statement of b. For this configuration, there was no difference. The variable a was modified prior to the values being fetched for the addition operation.

2 Bonus

The following C code was ran on a Windows 10 computer, compiled with GCC 10.3 using the MinGW project.

```
    int x = 0;
    if (x == 0 && x++==1);
    printf(”X is %d\n”,x);
    if (x == 3 && x++==2);
    printf(”X is %d\n”, x);
```

The purpose here is to determine if short circuiting is happening inside the conditional statements. The results are shown below:



```
X is 1
X is 1
```

As can be seen, the first conditional statement checked both input conditions, which resulted in the incrememnt of x being executed in the first conditional. However, as the $x == 3$ condition fails in the second conditional, the second increment of x is never called. This leads to the conclusion that short circuiting does indeed happen.