Design of Compilers - Lab One

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February 27, 2021

1 Dragon Book Exercises

1.1 Exercise 1.1.4

An advantage of using C as a target language for a compiler is that there are several compilers for C. Furthermore, these compilers compile to almost any type of hardware. So, any architecture that has C available to it will be able run your compiler.

1.2 Exercise 1.6.1

In the code block:

```
int w, x, y, z;
int i = 4; int j = 5;
{
    int j = 7;
    i = 6;
    w = i + j;
}
x = i + j;
{
    int i = 8;
    y = i + j;
}
z = i + j;
```

The values assigned to the variables w, x, y, and z are:

```
w = 13;
x = 11;
y = 13;
z = 11;
```

2 CRAFTING A COMPILER EXERCISES

2.1 EXERCISE 1.11

MOSS most likely uses a system similar to what we will have to build for our Lexer to check for code similarity. When a block of code is inputted, it would have to traverse through the program and compare what was inputted to pieces of software that exist on the internet.

2.2 EXERCISE 3.1

In the following C program:

```
main() {
    const float payment = 384.00;
    float bal;
    int month = 0;
    bal = 15000;
    while(bal > 0) {
        printf("Month: %2d Balance: %10.2f\n", month, bal);
        bal=bal-payment+0.015*bal;
        month=month+1;
    }
}
```

The token sequence produced is: main - keyword, () - symbol, open/closed braces - symbol, const - keyword, float - keyword, payment - identifier, = - symbol, 384 - digit, ; - symbol, float - keyword, bal - identifier, ; - symbol, int - keyword, month - identifier, ; - symbol, bal - identifier, = - symbol, 1500 - digit, ; - symbol, while - keyword, () - symbol, bal - identifier, > - symbol, 0 - digit, open/closed braces - symbol, printf - keyword, () - symbol, "Month: 2d Balance: 10.2f"," - characters, ; - symbol, bal - identifier, = - symbol, bal - identifier, - - symbol, payment - identifier, + - symbol, 0.015 - digit, * - symbol, bal - identifier, ; - symbol, month - identifier, = - symbol, month - identifier, + - symbol, 1 - digit.

Special information needs to be included for the variable tokens, because the values stored needs to be returned as well.