

Lab 1

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Crafting Compilers Exercises

1.11

One technique used by MOSS is tokenisation wherein code is transformed into sequences of tokens. For example, a token could be mapped to a variable and MOSS looks at where that variable is in the code structure regardless of what the variable is called. Characters such as line spacing and comments are ignored. Then, the tokenised source codes are compared, in order to analyze pairs of source code files that have a significant similarity, and if so, then plagiarism has likely occurred.

3.1

input:

```
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;
    } }
```

token stream:

line1: T_keyword T_symbol T_symbol T_symbol

line2: T_keyword T_keyword T_ID T_symbol T_float T_symbol

```

line3: T_keyword T_ID T_symbol

line4: T_keyword T_ID T_symbol T_int T_symbol

line5: T_ID T_symbol T_int T_symbol

line6: T_keyword T_symbol T_ID T_symbol T_int T_symbol T_symbol

line7: T_keyword T_symbol T_char T_char T_char T_char T_char T_char
      T_char T_char T_char T_char T_char T_char T_char T_char T_char
      T_char T_char T_char T_char T_char T_char T_char T_char T_char
      T_char T_char T_char T_symbol T_symbol T_ID T_symbol T_ID T_symbol
      T_symbol T_ID T_symbol T_ID T_symbol T_ID T_symbol T_float T_symbol
      T_ID T_symbol

line8: T_ID T_symbol T_ID T_symbol T_int T_symbol

line9: T_symbol T_symbol

```

Dragon Exercies

1.1.4

The main advantage of using C as the target language when creating a compiler is its speed, and efficiency. Since all pointers and memory allocation must be dealt with by hand, you ditch the bottleneck that other languages have (such as Java's Garbage Collector) that slow down compilation time. You also have granular control of every step of your compiler since C on provides the barebone tools you need to create a compiler.

1.6.1

```

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;  
    /* VALUES */  
    /* w == 13 */  
    /* x == 11 */  
    /* y == 13 */  
    /* z == 11 */
```