

Lab One

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1 PROBLEM ONE - DRAGON

1.1 LANGUAGE PROCESSORS

A compiler is a program that can read a specific *source* language and then translate that language in order for the code to be understood by a language that is different than the *source* code, which is called the *target* language.

A compiler allows code in a specific language to be translated and ran in another. For example, if we would like Java source code to be understood and ran by Windows, Mac, or Linux then we would use a compiler to make that happened.

1.2 EXERCISE 1.1.4

A compiler that translates a high-level language into another high-level language is called a *source-to-source* translator. What advantages are there to using C as a target language for a compiler?

1.2.1 ANSWER FOR 1.1.4

It would be an advantage using C as a target language because there are already many compilers made that can compile to C language from any other source language.

1.3 EXERCISE 1.6.1

For the block-structured C code of Fig. 1.13(a), indicate the values assigned to w, x, y, and z.

1.3.1 ANSWER FOR 1.6.1

w = 13; x = 13; y = 15; z = 15;

2 PROBLEM TWO - CAC

2.1 EXERCISE 1.11

The **Measure Of Software Similarity** (MOSS) [SWA03] tool can detect similarity of programs written in a variety of modern programming languages. Its main application has been in detecting similarity of programs submitted in computer science classes, where such similarity may indicate plagiarism (students, beware!). In theory, detecting equivalence of two programs is **undecidable**, but MOSS does a very good job of finding similarity in spite of that limitation.

Investigate the techniques MOSS uses to find similarity. How does MOSS differ from other approaches for detecting possible plagiarism?

2.1.1 ANSWER FOR 1.11

There are a few techniques that MOSS uses to find similarities in code. The MOSS tool searches for token and line matches between two different projects. The more similar tokens and lines found the greater the percentage is given to prove if the documents are plagiarized.

Other plagiarism tools, which use citations often still include cited quotes in the results leading to misinformation. MOSS can detect the slightest white space and can tell if it was purposely left or made in order to confuse MOSS. The MOSS tool can analyze better than other tools and would only mess up if drastic change has been made to someone's code.

2.2 EXERCISE 3.1

Assume the following text is presented to a C scanner:

```
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;
    }
}
```

What token sequence is produced? For which tokens must extra information be returned in addition to the token code?

2.2.1 ANSWER FOR 3.1

```
ID, LParen, RParen, LBrace,
Const, ID, ID, Assign, FloatNum, Semicolon,
ID, ID, Semicolon,
ID, ID, Assign, IntNum, SemiColon,
ID, LParen, ID, LessTHN, IntNum, RParen, LBrace,
print(Expr),
```

ID, Assign, ID, minus, ID, plus, IntNum, times, ID, Semicolon,
ID, Assign, ID, plus, IntNum, Semicolon,