

# Programming Design, Spring 2014

## Suggested Solution for Homework 01

Solution provider: 李孟修

### Problem 1:

Machine languages are the languages that computer can execute directly. It only contains 0s and 1s. It is extremely hard to write programs by machine languages.

Assembly languages use a pre-defined instruction set to replace the operation code in machine languages. Therefore, programmer can use the instructions like load, add, and move more quickly. It need an assembler to translate the assembly to machine language.

High-level languages are much more like human languages than assembly and machine language. Without worry about where to store and compute variables in assembly, high-level language compilers will arrange your variables and optimize the program flow while compiling. They are more easily to write a program and debug for human.

### Problem 2:

Assignment operator will compute the right-hand side result and assign it to the left-hand side variable, while comparison operator will return true or false to determine equality or difference between variables or values.

### Problem 3:

- (a) User can input a number and the program will determine whether the number is a prime number.
- (b) The program won't get into the loop part and say the negative integer is a prime number.

```
int candidate = 0, divisor = 2;
bool isPrime = true;
cin >> candidate;
if (candidate > 2){
    while(divisor < candidate){
        if(candidate % divisor == 0){
            isPrime = false;
            break;
        }
        divisor = divisor + 1;
    }
    cout << isPrime;
} else {
    cout << "Only integers greater than 2 are accepted."
}
```

- (c)

```
int candidate = 0, divisor = 2;
bool isPrime = true;
cin >> candidate;
while(divisor < candidate){
    if(candidate % divisor == 0){
        isPrime = false;
        break;
    }
    divisor = divisor + 1;
}
if (isPrime){
    cout << "The input number is a prime number." << endl;
} else {
    cout << " The input number is a common number." << endl;
}
```

**Problem 4:**

See the file "PD14-01a.cpp."

**Problem 5:**

See the file "PD14-01b.cpp."