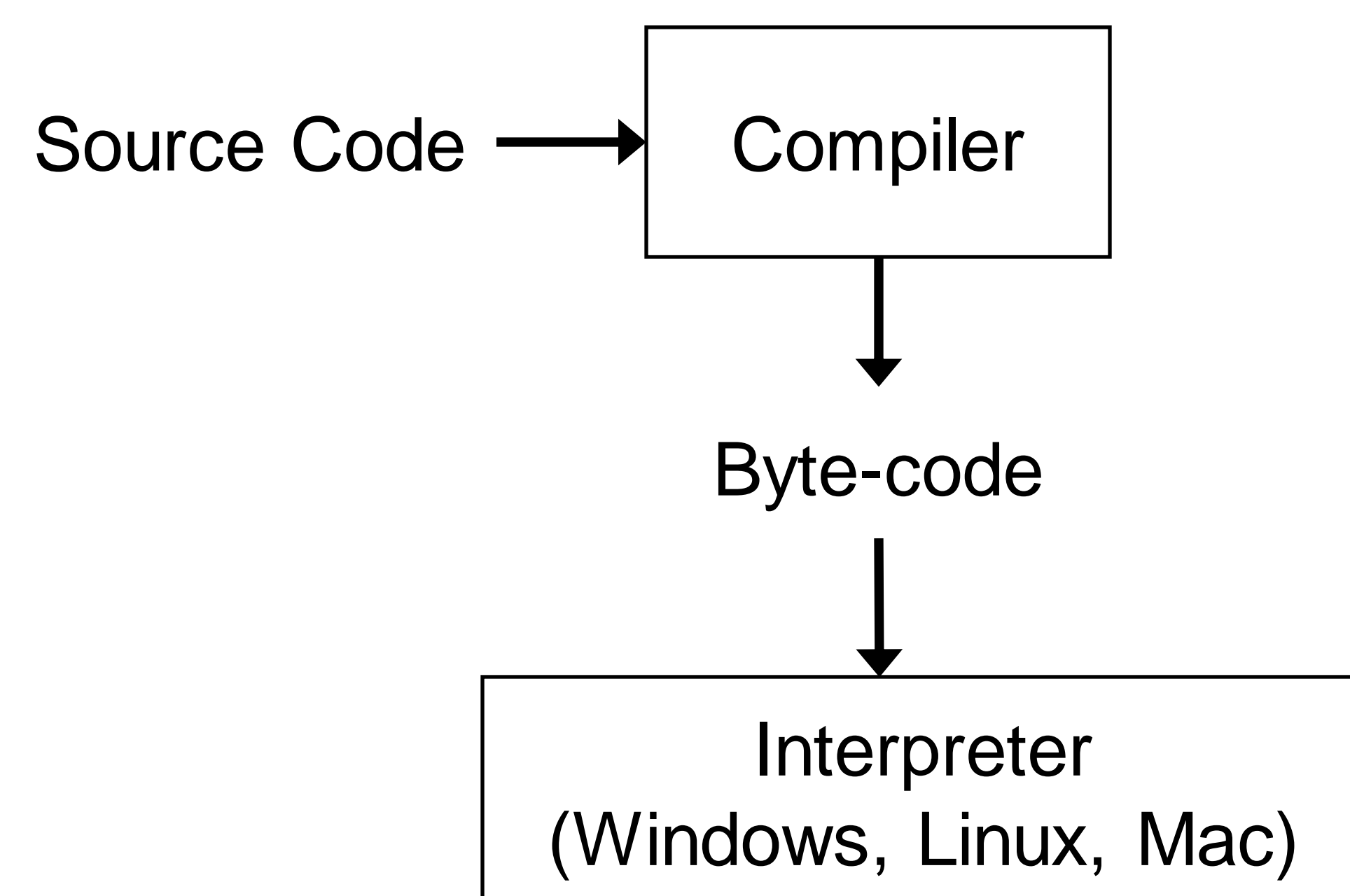


Introduction

The purpose of this project is to create a new programming language that focuses on variable security to help protect against mistakes that may lead to the release of confidential information. Some languages such as C++ or Java allow for the programmer to declare private and public variables within a class, however, variable security takes this a step further and allows the programmer to introduce multiple levels of security priorities for variables. This means that you could potentially have hierarchies of security for variables within the same program and within the same function. These hierarchies will define how certain variables can interact within one another.



Methods

The proposed programming language has been developed by first creating a stack based virtual machine and then writing a compiler which takes a high-level readable language and translates it to the byte-code of the virtual machine. The virtual machine is written as a 64-bit architecture which allows the language to take full advantage of modern hardware and operating systems.

Sample Code

Leibniz formula for calculating Pi

```
fn void main() {
  let n int:0 = 100000000;
  let pi float:0 = 4.0;
  let num float:0 = 4.0;
  let den float:0 = 3.0;

  while n >= 0 {
    num = num * -1.0;
    pi = pi + (num / den);
    den = den + 2.0;
    n = n - 1;
  }
  print(pi, "\n");
  return;
}
```

Results

The proposed language has implemented the variable security feature, basic functions, while loops, control flow statements, a break statement, and a small standard library. The current development of this language is available on GitHub in the following link.

https://github.com/C-W-M-Oliver8012/Variable_Security_Language-VSL

Conclusions

This project is served as an example for anyone who wants to develop a new language using virtual machines. The variable security feature is a viable option for any language that needs to add additional security features to handle sensitive and confidential information.

Contact Information:
cwmiller@eiu.edu