

VIETNAM NATIONAL UNIVERSITY - HO CHI MINH CITY  
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY  
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



PRINCIPLES OF PROGRAMMING LANGUAGES - CO3005

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# ASSIGNMENT 4

*Code Generation*

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HO CHI MINH CITY, 04/2022

# ASSIGNMENT 4

## Code Generation

### Version 1.1

After completing this assignment, you will be able to

- explain the mechanism of some structures in a programming language.
- use Python to implement a code generation phase for a stack-based machine like JVM.
- create a complete compiler for JVM.

## 1 Specification

In this assignment, you are required to write a code generation checker for a program written in MP. The code generation will generate Jasmin code from AST created from assignment 2. The Jasmin code then is transferred to Java bytecode which must be run correctly in a Java Virtual Machine (JVM). To complete this assignment, you need to:

- Read carefully the specification of D96 language.
- Download initial.zip and unzip it.
- If you would like to make your testcases in D96 language, copy your D96.g4 to folder main/d96/parser and your ASTGeneration.py to folder main/D96/astgen. Otherwise, you can build your testcases in AST like test 502 and 503.
- Modify main/D96/codegen/CodeGenerator.py and main/D96/codegen/Emitter.py to implement this assignment.
- Modify test/CodeGenSuite.py to create 100 testcases to test your code. Note that the entry method (i.e. main) must be in the class whose name is "Program".
- Can modify main/D96/codegen/MachineCode.py to suit your implementation.

All testcases of this assignment is grammatically and semantically correct.

## 2 Submissions

As this assignment requires big resource to run so the pre-test cannot be set up as the previous assignments. You must check yourself your work before submission. The operating system when checking your submission is Linux.



The deadline of assignment 4 is announced in the class website.

You must complete the assignment by yourself and do not let your work seen by someone else, otherwise, you will be punished by the university rule for plagiarism.

### 3 Plagiarism

- You must complete the assignment by yourself and do not let your work seen by someone else.
- You just submit your code in your allocated account.

If you violate any requirement, you will be punished by the university rule for plagiarism.

### 4 Change Log

- Update section "1 Specification".