CS502: Compiler Design

Fall 2022 (Due: October 15^{th} , 2022)

Assignment A3: The one where help is sought

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1 Problem Statement

Generate intermediate code for the given TempoJava grammar in which you have to remove all the objects and classes and make all the methods children of the main Java class such that all methods are siblings.

2 Monica in Mandi!

Monica moved to Mandi recently in a small cottage to find her inner peace and be one with the nature. The cottage has limited space. The friends had helped her with the packing and in the process she ended up with a lot of luggage (classes). Now that she is unpacking she needs to have all the items into two armoires which holds her accessories (member fields) and clothes (member functions). She can put her belongings to these two armoires based on there types and can fetch as and when required. Be a good F·R·I·E·N·D and help her unpack such that the end result is same as her own apartment.

3 Detailed Specification

You are provided with two grammar files TempoJava.jj and TempNoJava.jj. Your task is to convert the program that is based on TempoJava.jj to TempNoJava.jj such that output of both the files is the same when compiled and run.

The conversion process is as follows:

The `TempoJava.jj` grammar program has various classes with fields and methods. The program uses objects for accessing these fields and methods.

The `TempNoJava.jj` grammar allows only one class declaration (which is essential in Java) and therefore all the methods are part of this single class.

You are provided with a *MemMgr* API which mimics the process of memory allocation and getters-setters for member fields as well as functions. You can use this *MemMgr* to allocate memory to a program, and store and load functions and fields from correct indices as taught in the class.

API Specs:

- **alloc(int n)**: takes an integer input and allocates n bytes.
- **store(Object x, int index, Object value)**: stores value at given index of object x.
- **load(Object x, int index)**: returns value at given index from object x
- **callFunc(fnName, Object x, (Object param)*)**: calls given fnName from object x and passes it parameters (a varargs argument).

ProTip: you need to typecast the returned values to the desired type.

4 Evaluation

Your submission must be named `rollnum-a3.zip`, where `rollnum` is your roll-number in small letters. Upon unzipping the submission, we should get a directory named `rollnum-a3`. The main class inside this directory should be named `Main.java`. Your program should read from the standard input and print to the standard output. You can leave all the visitors and syntax-tree nodes as it is, but remember to remove all the `.class` files.

For each TempoJava testcase, we would first try to parse your output file with the TempNoJava grammar. If this succeeds, we would compile and run your program with javac and java. If the output matches with the expected output for the testcase, you would get marks for the corresponding testcase.

5 Plagiarism Warning

You are allowed to discuss publicly on class, but are supposed to do the assignment completely individually. We would be using sophisticated plagiarism checkers, and if similarity is found, the penalty used in the course would be as follows:

- First instance: 0 marks in the assignment
- Second instance: Grade reduction.
- Third instance: F grade and report to disciplinary committee.

-*-*-*- Do the assignment honestly; enjoy learning the course. -*-*-*-