

Type-Safe Bytecode Generation in Scala

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Mnemonics is a novel bytecode generation library for the Java Virtual Machine (JVM), written in Scala. It avoids the generation of ill-formed bytecode sequences by adopting a typed representation of the stack and the local variables. Individual instructions are modeled as functions that transform these types according to the action of the instruction. The library exploits a number of advanced features of Scala's type system (type inference with bounded polymorphism, objects with type members, implicit parameters, and reflection) to guarantee that the compiler rejects illegal combinations of instructions at compile time.