А. О. Мельник[1]

АРХІТЕКТУРА СИСТЕМИ КОМАНД.

СТЕКОВІ АРХІТЕКТУРИ.

[1] Вінницький національний технічний університет;

Анотація
В даній статті розглядаються особливості використання набору команд архітектури . Визначено стек в якості абстрактного типу даних та були визначені основні характеристики стекових машин . Наведено переваги та недоліки стекових машин.
Ключові слова: архітектура системи команд, стекові архітектури, стек.

Abstract
The present article deals with the peculiarities of using an instruction set architecture. A stack as an abstract data type has been specified and the characteristics of stack machines were defined. Advantages and disadvantages of stack machine have been selected.
Keywords: instruction set architecture, stack architecture, a stack

An instruction set, or instruction set architecture (ISA), is the part of the computer architecture related to programming, including the native data types, instructions, registers, addressing modes, memory architecture, interrupt and exception handling, and external I/O. An ISA includes a specification of the set of opcodes (machine language), and the native commands implemented by a particular processor.

One type of instruction set is stackable architecture.

In computer science, a stack or LIFO (last in, first out) is an abstract data type that serves as a collection of elements, with two principal operations: push, which adds an element to the collection, and pop, which removes the last element that was added.[1]

The term LIFO stems from the fact that, using these operations, each element "popped off" a stack in series of pushes and pops is the last (most recent) element that was "pushed into" within the sequence. This is equivalent to the requirement that, considered as a linear data structure, or more abstractly a sequential collection, the push and pop operations occur only at one end of the structure, referred to as the top of the stack. (Additionally, a peek operation may give access to the top.)

In computer science, computer engineering and in programming language implementations, a stack machine is a real or emulated computer that uses a pushdown stack rather than individual machine registers to evaluate each sub-expression in the program. A stack computer is programmed with a reverse Polish notation instruction set.

The common alternative to stack machines are register machines, in which each instruction explicitly names the specific registers to use for operand and result values.

Advantages of stack machine instruction sets
• Very compact object code
• Stack machines have much smaller instructions than the other styles of machines. But operand loads are separate and so stack code requires roughly twice as many instructions as the equivalent code for register machines. The total code size (in bytes) is still less for stack machines.
• Simple compilers
• Compilers for stack machines are simpler and quicker to build than compilers for other machines. Code generation is trivial and independent of prior or subsequent code.
• Minimal processor state
• A machine with an expression stack can get by with just two visible registers, the top-of-stack address and the next-instruction address. The minimal hardware implementation has few bits of flipflops or registers. Faster implementations buffer the topmost N stack cells into invisible temp registers to reduce memory stack cycles.

Performance disadvantages of stack machines
* More memory references
* Factoring out common subexpressions has high cost
* Rigid code order
* Hides a faster register machine inside
* More instructions, slower interpreters

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СПИСОК ВИКОРИСТАНОЇ ЛІТЕРАТУРИ

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Альона Олегівна Мельник— студент групи 2КІ-15б, факультет інформаційних технологій та комп'ютерної інженерії, Вінницький національний технічний університет, Вінниця, e-mail: k004479@yandex.ua;

Науковий керівник: *Степанова Ірина Сергіївна*— канд. філол. наук, доцент, завідувач кафедри іноземних мов, Вінницький національний технічний університет, м. Вінниця.

Aliona O. Melnyk — Department for Information Technologies and Computer Engineering, Vinnytsia National Technical University, Vinnytsia, email : k004479@yandex.ua

Supervisor: *Iryna S. Stepanova* — Cand. Sc. (Eng), Associate Professor, Head of the Department of Foreign Language, Vinnytsia National Technical University, Vinnytsia.