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Period 2

APCS

Kuszmaul

Vocabulary 10

Tail recursion: A type of recursion where the recursive call is the very last thing in the function.

Substitution: To put in the place of another. [1]

Applicative order (of evaluation): All arguments of a procedure are evaluated when the procedure is applied.[2]

Normal order (of evaluation): The arguments of a procedure are not evaluated until they are actually needed.[3]

Virtual memory: A feature of an operating system that allows for a computer to compensate for a shortages of physical memory by temporarily transferring pages of data from RAM to disk storage.[4]

Virtual processor: A physical central processing unit that is assigned to a virtual machine.[5]

Recurrence relation: An equation that recursively defines a sequence or array of values, once one or more initial terms are given: each further term of the sequence or array is defined as a function of the preceding terms.[6]

1. (tail recursion - substitution) A programmer can substitute tail recursion with iterative recursion if he or she wishes.

2. (tail recursion - applicative order) If applicative order is used in a program that has tail recursion, the recursive process may not finish if an error occurs due to applicative order.

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[1] From my own previous knowledge of the word.

[2] Thanks to Mr. Kuszmaul's informative lecture on applicative order using meteors and lemon-scented napkins as an analogy for the arguments of a procedure to which applicative order applies.

[3] Thanks to Mr. Kuszmaul's informative lecture on normal order.

[4] "What is virtual memory? - Definition from WhatIs.com." 2011. 6 Nov. 2015 <http://searchstorage.techtarget.com/definition/virtual-memory>

[5] "What is virtual CPU (vCPU)? - Definition from WhatIs.com." 2013. 6 Nov. 2015 <http://whatis.techtarget.com/definition/virtual-CPU-vCPU>

[6] "Recurrence relation - Wikipedia, the free encyclopedia." 2011. 6 Nov. 2015 <https://en.wikipedia.org/wiki/Recurrence_relation>

3. (tail recursion - normal order) If normal order is used in a program that has tail recursion, less errors are likely to occur.

4. (tail recursion - virtual memory) Tail recursion may require the use of virtual memory if there is a shortage of physical memory.

5. (tail recursion - virtual processor) While a virtual machine is allocated one virtual processor by default, a program can only run only one tail recursion at a time.

6. (tail recursion - recurrence relation) A tail recursion and a recurrent relation are similar in the fact that both use recursion as a way to find the next item in a sequence or order.

7. (substitution - applicative order) Applicative order will evaluate an argument even if it has been substituted for something else.

8. (substitution - normal order) In normal order, substituting a value in for another may have no effects if the substituted argument is never evaluated.

9. (substitution - virtual memory) Substitution does not require much virtual memory from the computer.

10. (substitution - virtual processor) One virtual processor can actually be substituted for multiple; This allows virtual machines to share the same core.

11. (substitution - recurrence relation) Substitution does not occur in recurrence relation because each value depends on the value before it.

12. (applicative order - normal order) In applicative order, all arguments of a procedure are evaluated when the procedure is applied while in normal order, the arguments of a procedure are not evaluated until they are actually needed.

13. (applicative order - virtual memory) Applicative order will evaluate an argument regardless if it is wasting virtual memory or not.

14. (applicative order - virtual processor) Applicative order would require more work from the virtual processor because all arguments of a procedure are evaluated even if it is not necessary.

15. (applicative order - recurrence relation) A recurrence relation would probably run best using an applicative order because every argument of the procedure is needed in order to determine the next value of the sequence.

16. (normal order - virtual memory) Normal order can potentially save virtual memory because the arguments of a procedure are not evaluated until necessary.

17. (normal order - virtual processor) Normal order requires less work from the virtual processor because the arguments of a procedure are not evaluated until it is necessary.

18. (normal order - recurrence relation) In a recurrence relation, every argument passed into the procedure is used, which means that normal order would not be beneficial.

19. (virtual memory - virtual processor) Virtual memory is the computer's RAM combined with temporary space on the hard disk, while virtual processor is a physical central processing unit that is assigned to a virtual machine.

20. (virtual memory - recurrence relation) The virtual memory may be needed in a recurrence relation if the values get too large and the number of operations exceed a limit.

21. (virtual processor - recurrence relation) A recurrence relation may require a lot of work from the virtual processor if there are a myriad of operations.