

## Lecture 4: January 30

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## 4.1 Locks with Get-and-Set Operation

### 4.1.1 Get-and-Set

The method `var.getAndSet(newVal)` returns the current value of `var` and sets the value of `var` to `newVal`, all in the same instruction.

### 4.1.2 Get-and-Set

## 4.2 Transitive Closure

Our goal is to achieve running time  $O(M(n)\log n)$  for APSP where  $M(n)$  is the time for  $n \times n$  matrix multiplication. Let's see if we can achieve this for a simpler but related problem, namely *Transitive Closure*:

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## References

- [AGM97] N. ALON, Z. GALIL and O. MARGALIT, On the Exponent of the All Pairs Shortest Path Problem, *Journal of Computer and System Sciences* **54** (1997), pp. 255–262.
- [F76] M. L. FREDMAN, New Bounds on the Complexity of the Shortest Path Problem, *SIAM Journal on Computing* **5** (1976), pp. 83–89.