Amortized Time Complexity – Theory(Introduction)

It applies not to a single run of algorithm but rather to a sequence of operations performed on the same data structure . As we see in the stack previously. As the stack gets 2 it gets doubled .

We can term such type of Stack as Augmented Stack where Augmented means greater in size.

Such doubling size , we see in dynamic hash table data structures , where each time of overflow the size increases.

According Cormen , Amortized Analysis can be defined as follows: "An amortized analysis is any strategy for analysing a sequence of operations to show that the average cost per operation is small, even though a single operation within the sequence might be expensive."

Real World Example

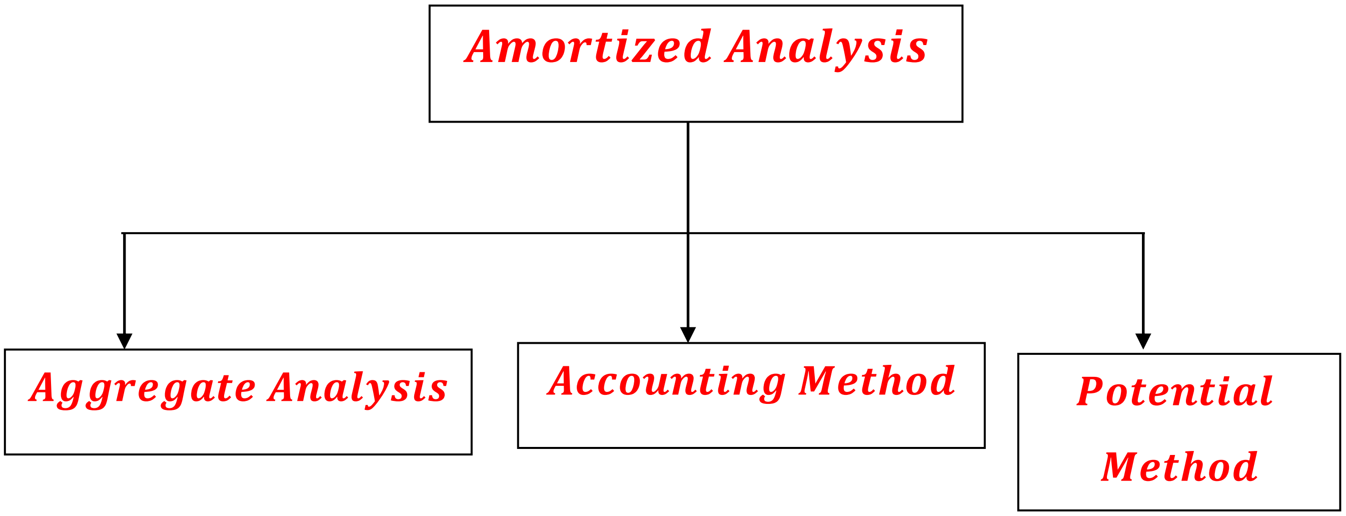
Let us assume that X gets a salary of ₹10,000. He saves ₹2000 per month, which goes on for 10 months.
In Worst Case Scenario: if the expenditure amounts to ₹15,000, X's saving would help to compensate the excess expenditure in an amortized manner.

In short, like banks keep the account details of a customer , one is required to maintain the account of the cost of the sequence of operations.

OBSERVATION

1. ***Amortized Cost > Actual Cost.***
2. ***It gives us the tight bound and tight bound is associated with Average Case Time Complexity.***

Classification of Calculation on Amortized Analysis



Amortized Analysis

Aggregate Analysis

Accounting Method

Potential Method

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