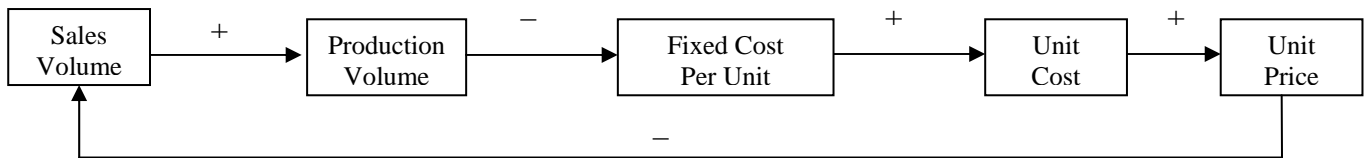


Feedback Control

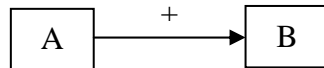
I. Positive Feedback

Consider



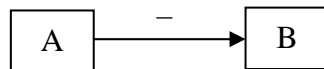
where:

- **Positive Correlation**



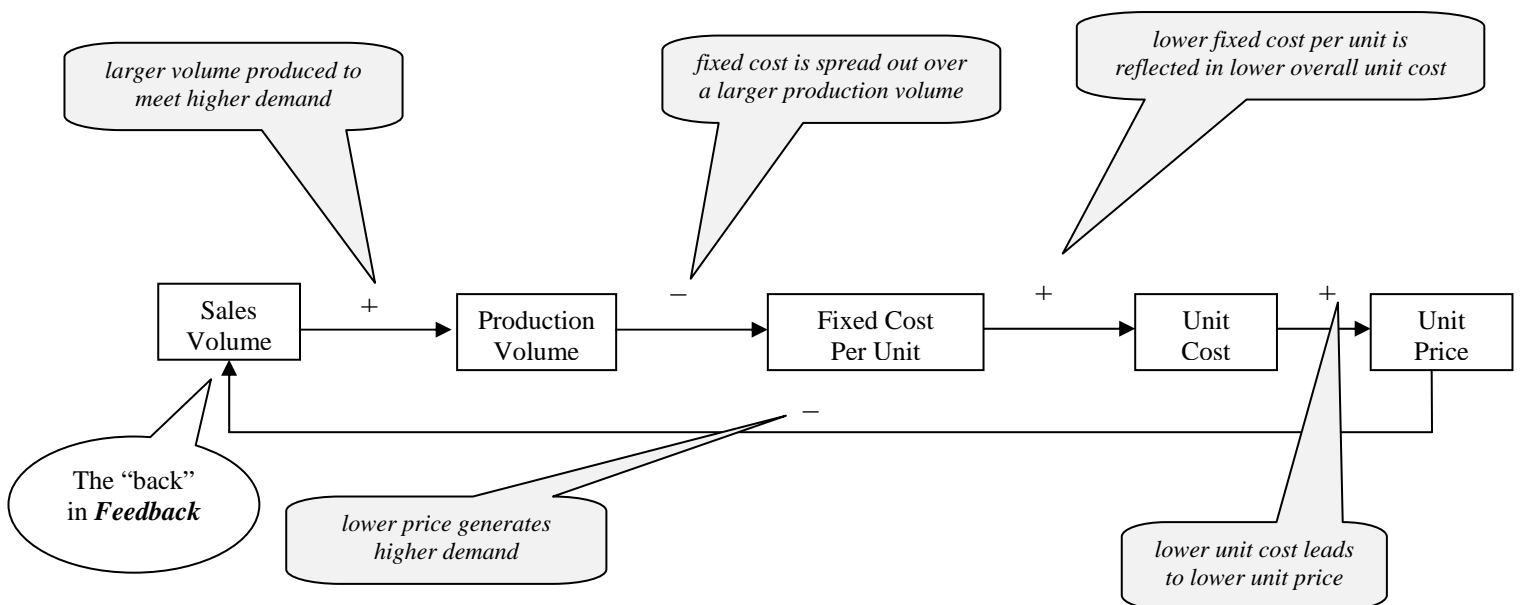
As variable A increases, so does B
As variable A decreases, so does B

- **Negative Correlation**



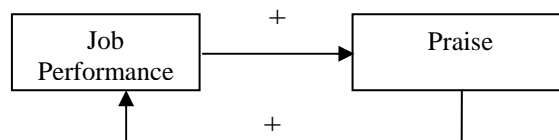
As variable A increases, variable B decreases
As variable A decreases, variable B increases

One possible scenario:



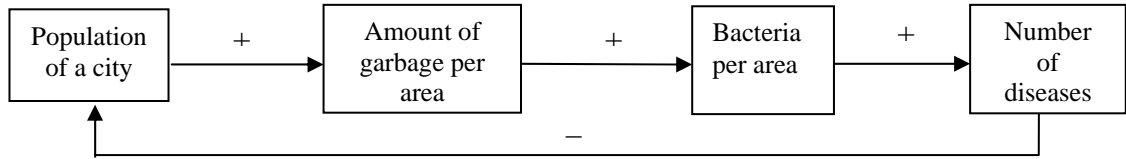
- **Positive Feedback** = an even number of $-$'s (the negatives cancel each other pair-wise):
Overall +

Another Example:



Net effect of Positive Feedback: Self-reinforcing, amplification-seeking (widens the gap)

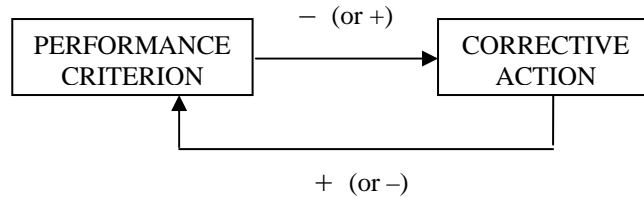
II. Negative Feedback



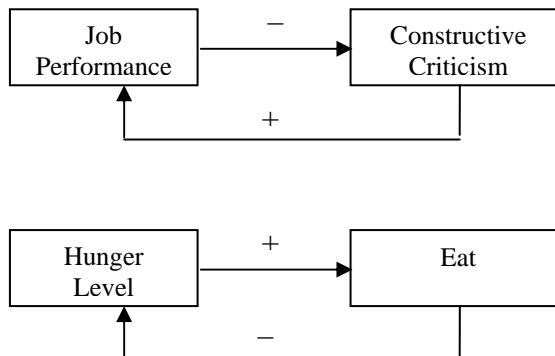
- **Negative Feedback** = an odd number of -'s (all the negatives, except one, cancel each other pair-wise): Overall -

The above is an example of a “natural process” where no goals are associated with the feedback.

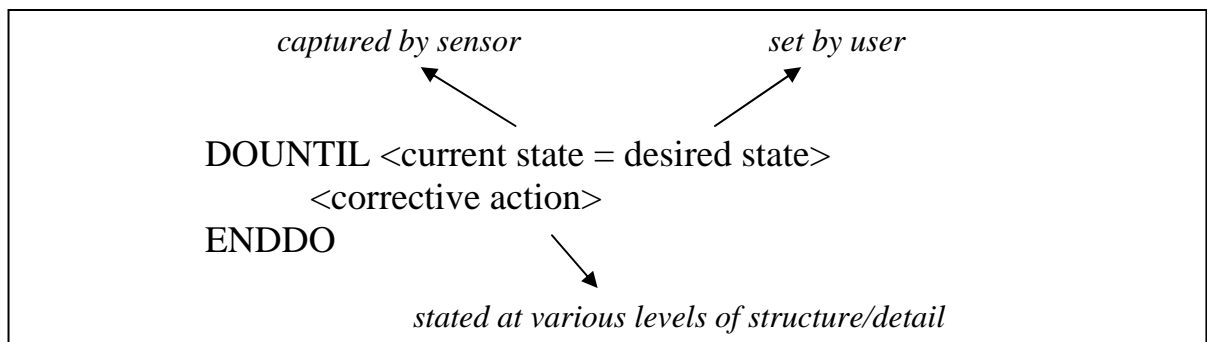
On the other hand, when goals are associated with the feedback, we have:



Examples:





Net effect of Negative Feedback: Self-correcting, stability-seeking (closes the gap)



The Logic of (Negative) Feedback Control

Legend

Physical: 
Information: 

Control Systems (automobile)

