INVENTORY CONTROL

There are numerous books and articles concerned on inventory problems.
Here we will discuss about importance of *basic inventory models* which have a great influence on warehouse management.
Of course, some other aspects of inventory control will be briefly discussed.
Inventories are investigated a lot (see Inventory theory).
So, we'll see just some aspects.

Inventory Management under Conditions of Certainty

Replenishment policy *under conditions of certainty* requires the ***balancing of ordering costs***

against

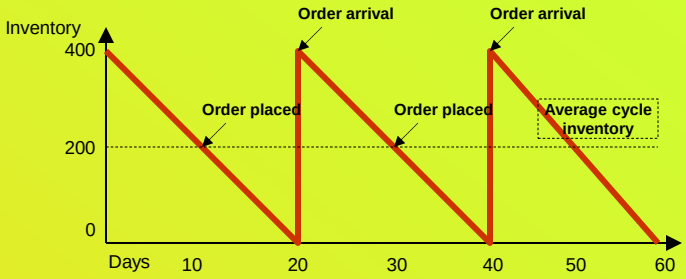
inventory carrying costs (just discuss about them).

Economic Ordering Quantity (EOQ) is used to minimize total of inventory carrying costs and ordering costs. The question be discussed on the example shown on a figure. Based on conditions of certainty (consumption, lead time), we have to determine the most **E**conomical **O**rder **Q**uantity using known formula:

$$EOQ = \sqrt{\frac{2PD}{CV}}$$

where
P = ordering cost
D = Annual demand of usage of products
C = Annual inventory carrying costs
V = Average cost or value of the unit on inventory

A. Ordered quantity of 400 units



B. Ordered quantity of 400 units

C. Ordered quantity of 600 units

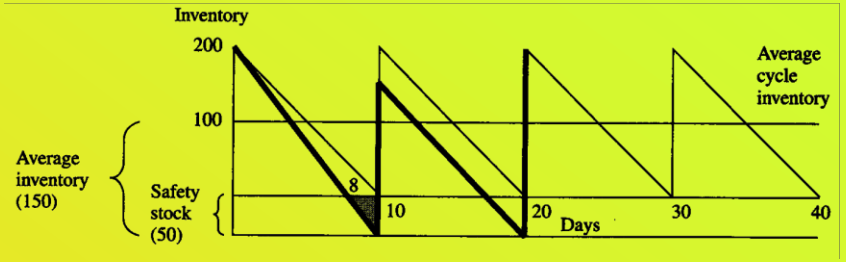
The EOQ model has following assumptions:
- a continuous, constant, and known rate of demand
- constant and known replenishment rate
- constant purchase price independent of the order quantity or time
- constant transportation cost independent of the order quantity or time
- the satisfaction of all demand (no stockouts are permitted)
- …

Those reasons generate involving and developing basic model, what will not be discussed here.

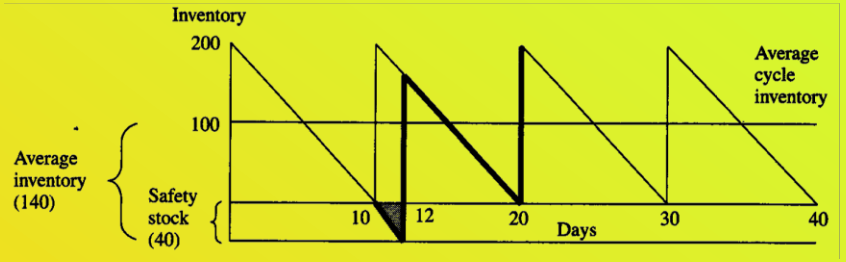
Inventory Management under uncertainty

Variability in demand or/and lead time typically generates necessity for the safety stock. Just discuss a figures:

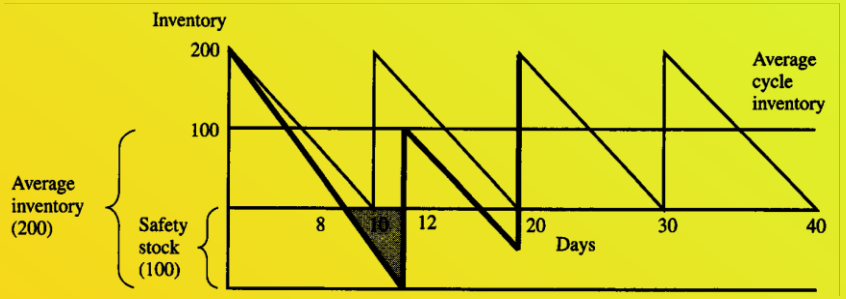
1 - if demand increase on 25 from 20 units/day, there are inventories for 8 days; it means 2 days out of stock, what generates safety stock of 50 units.



2 - if lead time vary 2 days, stockout will be 40 units.



3 - if demand increase on 25 units/day and lead time on 12 days, safety stock is 100 units, and average inventory is 200 units.



Problem involves calculating safety stock requirements, using adequate distributions (gathering statistically valid samples of data) and formulas (not discussed here).