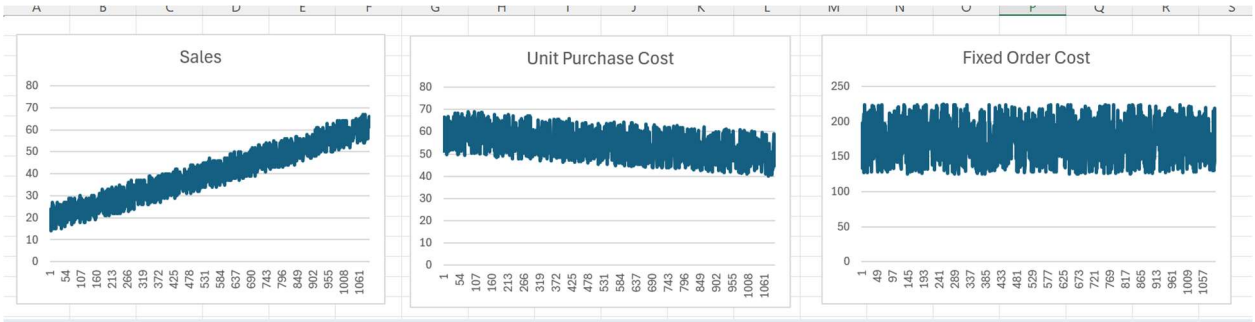
Module 11 – EOQ

Exploratory Data Analysis



E	F	G	H
Naïve Forecast Sales 2025	Naïve Forecast Unit Cost 2025	Naïve Forecast Fixed Cost 2025	
19837	51.76928962	173.393388	

Model Formulation

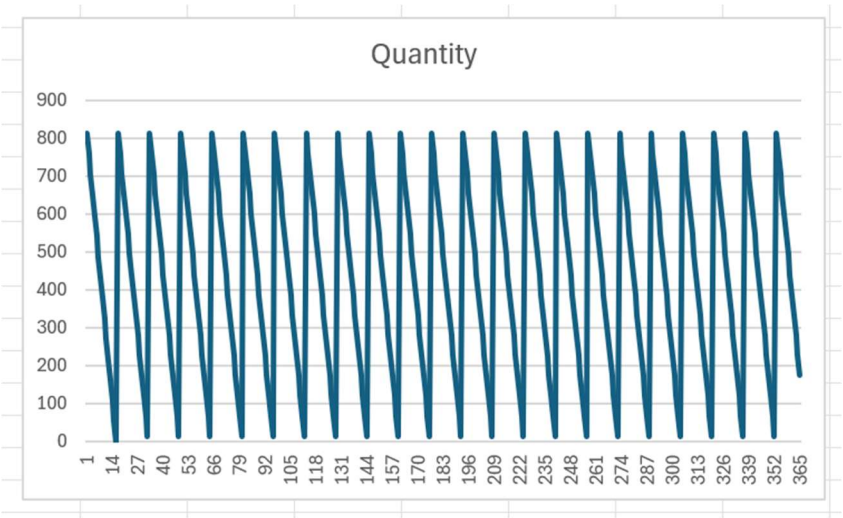
MIN: DC + (D/Q)S+(Q/2)Ci
Subject to: Q >= 1

Demand: 19,837
Cost per unit: 51.77
Cost per order: 173.39
Holding Cost: 20%
Quantity: 815.11

MIN: 19,837*51.77+(19,837/815.11)173.39+(815.11/2)51.77*20%

Model Optimized for Minimizing Costs with Optimal Order Quantity

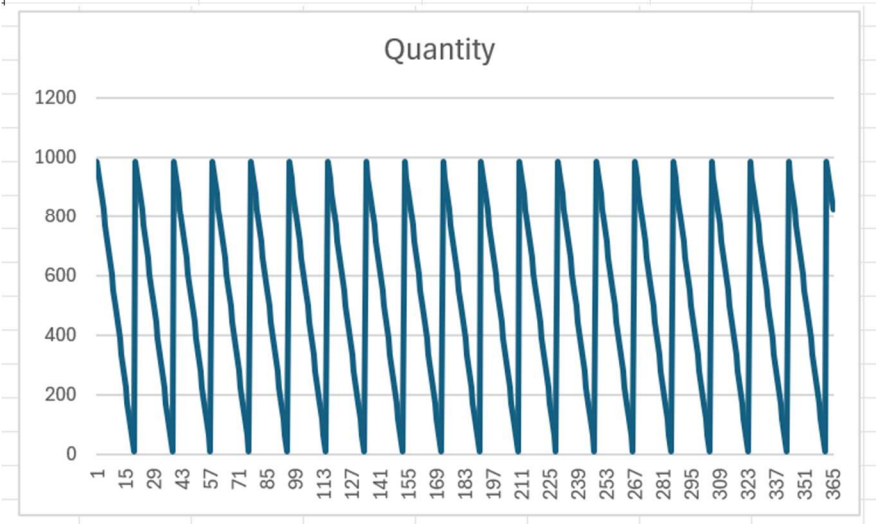
D	**Annual Demand**	**19,837**
C	**Cost per Unit**	**$51.77**
S	**Cost per Order**	**$173.39**
i	**Holding Cost**	**20%**
Q	**Order Quantity**	815.11
	Purchasing Cost	$1,026,942
	Cost of Ordering	$4,220
	Inventory Cost	$4,220
	Total Cost	$1,035,381



The optimal solution for order quantity demand is 815.11 and the optimal total cost for this is $1,035,381.

Model with Stipulation

Naïve Forecast Sales 2025	Naïve Forecast Unit Cost 2025	Naïve Forecast Fixed Cost 2025		Holding_cost_rate	Shortage_cost
19837	51.76928962	173.393388		0.2	22
				Actual planned backorders	316.330388
	D	Annual Demand	19,837	54.34794521	
	C	Cost per Unit	$51.77		
	S	Cost per Order	$173.39		
	i	Holding Cost	20%		
	Q	Order Quantity	988.48		
		Cost of planned backorders	$1,114		
		Cost of Ordering	$3,480		
		Inventory Cost	$2,366		
		Total Cost	$6,959		



You may want to include planned back orders to show customers that they can still order even if the company is sold out. This can also help with forecasting in the future as well.

This will help the business to be more organized and is planning ahead for just in case situations.