



Department of Mechanical Engineering

Academic Year 2021 – 2022 (Odd Semester)

Degree, Semester & Branch: B.E, VII & EEE, Mechanical, CSE

Course Code & Title: GE8077 & Total Quality Management

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Innovative Practice Description

- **Unit / Topic:** Unit 3, 4 / Old QC tools & Control charts
- **Course Outcome:** CO 3 , CO4
- **Topic Learning Outcome:** TLO 1
- **Activity Chosen:** Problem solving using Matlab
- **Justification:** CO 3 The students will be able to apply the tools and techniques of quality management to manufacturing and service processes , CO 4 The students will be able to express the various TQM tools and techniques such as Control Charts, QFD and TPM
- **Time Allotted for the Activity:** 50 minutes
- **Details of the Implementation:**

Total no of students, EEE – 29 students, CSE - 18 students , Mechanical – 17 students

Problem Statement:

Jack has taken over a failing computer service center, with a host of problems that need resolving. His objective is to increase overall customer satisfaction.

He decides to carry out a Pareto Analysis to assess and prioritize the biggest issues facing the center. He starts by listing these (see the Problem column in the table, below). He then identifies the underlying causes behind each (see the Causes column). Finally, he scores each item by the number of customer complaints that each has received (see the Score column).

Items	Problem	Cause	Score
1	Phones aren't answered quickly enough.	Too few customer service staff.	20
2	Staff seem distracted and under pressure.	Too few customer service staff.	12
3	Engineers aren't well organized and often need to book second visits to bring extra parts.	Poor organization and preparation.	34
4	Engineers don't know what time they'll arrive. This means that customers may have to be in all day for an engineer to visit.	Poor organization and preparation.	54
5	Customer service staff don't always seem to know what they're doing.	Lack of training.	23

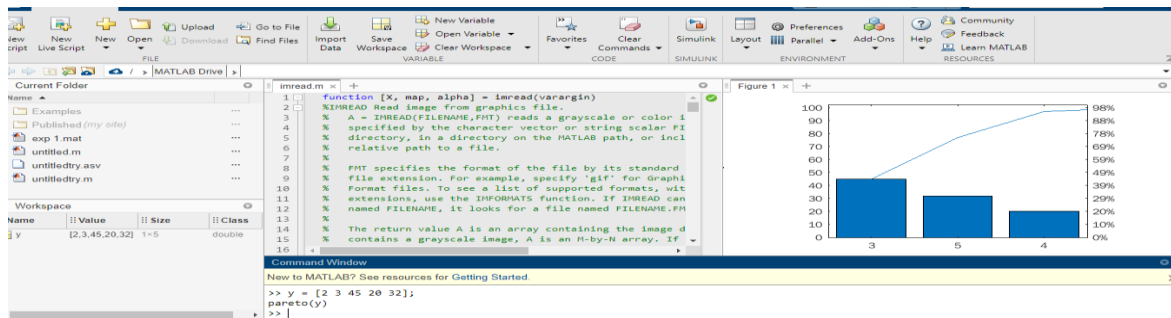
- Topic 1 - Traditional Quality control Tools
- Problem solving tools and techniques are essential to effective process improvement because they help teams uncover the root causes of problems and help them develop solutions to eliminate the problems.
- The Japanese quality guru Ishikawa proposed 'Seven Basic Tools' based on statistical techniques to facilitate successful accomplishment of quality improvement objectives.

The seven old QC tools are

- i. Flowchart
- ii. Check sheet
- iii. Histogram
- iv. Pareto diagram
- v. Cause and effect diagram
- vi. Scatter diagram
- vii. Control chart

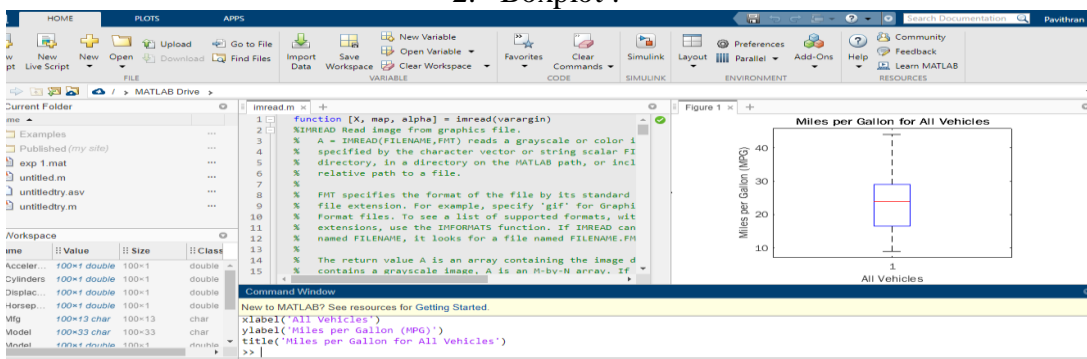
MATLAB Program:

1. Pareto chart
Given : Y = [20 12 34 56 23]



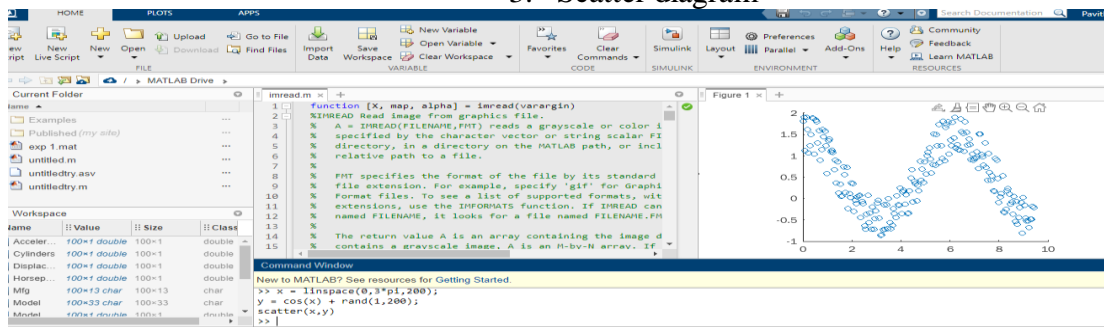
Pareto chart is helps to identifying the vital few causes that account for a dominant share of quality loss.

2. Boxplot :



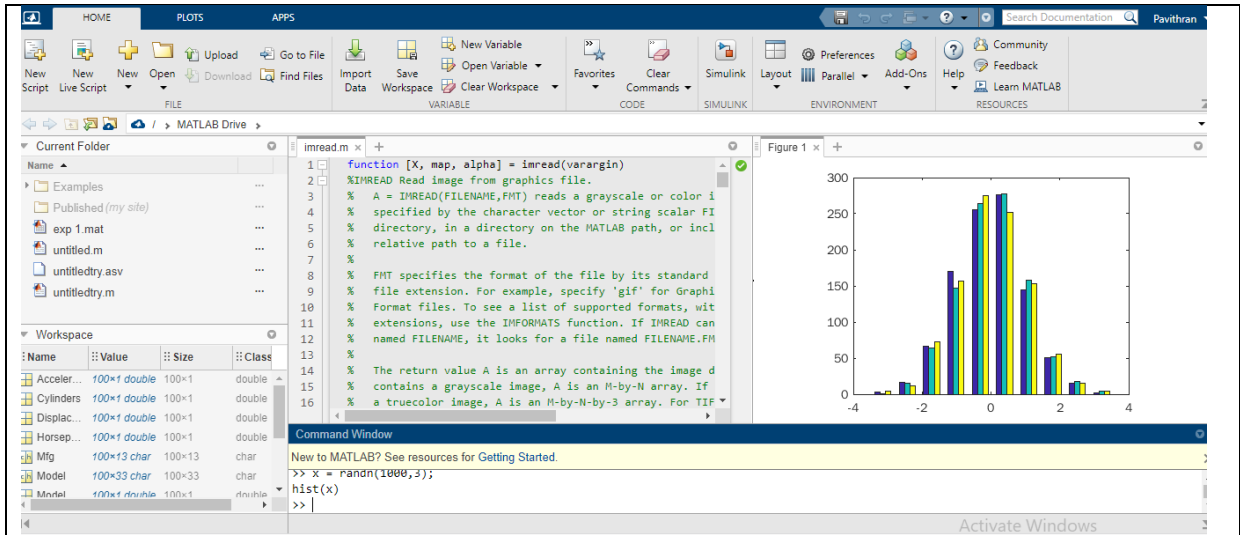
It is a visual representation of statistical five number summary of a given data. It induced robust summary statistics.

3. Scatter diagram



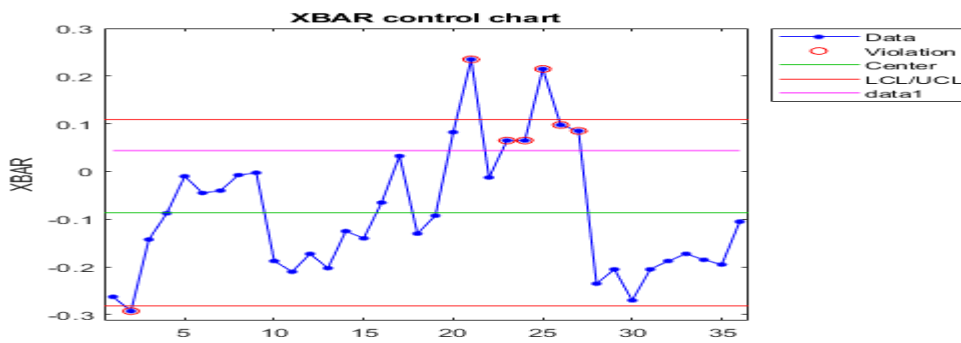
It is used for depicting the relationship between two variables, It is used for graphs of paired datas for statistical analysis

4. Histogram



Histogram is used for graphically displaying the frequency distribution of the numerical data. It is used for summarize discrete or continuous data that are measured on the interval table.

Control charts



Proof



Co-Po Mapping:

PO	1	2	3	4	5	6	7	8	9	10	11	12	PSO 2
CO 3	2	2		3	3			1	2	2	1	2	3
CO 4	2	2		3	3			1	2	2	1	2	

(1 – Low

2 – Moderate

3 – High)

- **Reflective Critique:**

- ❖ **Benefit of the practice:** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

This advanced learning method helps the students to understand the concept most efficiently. The amount of time required to keep the chart up to date is minimal in most cases. For example, if you are examining weekly sales figures, you will only plot one point per week once the chart has been established. If you are looking at the fraction of invoices with errors on a daily basis, you will only plot one point per day.

- ❖ **Challenges faced in implementation:**

Some of the student's forget their mat lab login id after some time they find the password login and continue their coding path successfully.

References:

- ❖ **James R.Evans and William M.Lindsay, & "The management and control of quality", 8th edition , First Indian edition , Cengage learning, 2012**

Rubrics:

Criteria	Ratings			Pts
Presentation preparation	7 pts Full Marks	0 pts No Marks		7 pts
Timely submission	3 pts Good Submitted within the deadline	2 pts Average Late submission within 3 days after deadline	1 pts Poor Late submission after 3 days from deadline	3 pts
				Total Points: 10

Signature of the Faculty Member

HoD/Mech