

The purpose of this lab is to gain experience with simple Java graphics objects presented in the context of an applet and displayed in a browser window. The completed lab must be submitted via Blackboard NLT (no later than) one week from the start time of your regular lab session. If you have questions, use the Blackboard discussion forums (and instructor/GTA/UTA office hours) to obtain assistance.

Background:

A histogram is a statistical diagram consisting of rectangles that represent the frequency of variables of interest. A special type of histogram is called a Pareto chart. The Pareto chart is based on the theories and methods of the Italian economist Vilfredo Pareto (1848-1923). When faced with a range of issues, it is often difficult to know which to work on first. To resolve this dilemma, the most useful thing to do is to apply Pareto's 80-20 rule. This rule essentially says - "eighty percent of your troubles will come from 20 percent of your problems". In other words, problems will rarely have equal impact, so it is best to first concentrate on the most important. Thus a Pareto chart is essentially a histogram that orders the frequencies of the variables of interest in order to illuminate a strategy for process improvement.

Lab Requirements:

- The source code for this lab must be submitted in a file named **Pareto.java**
- The html code for this lab must be submitted in a file named **Pareto.html**
- The source code file must contain a **class header** formatted as follows:

```
/**
source_file_name.java
Student Name: Josephine Student
Assignment: Lab #1
Lab Section: xxx
Submission Date: 09/09/9999
Honor Code Statement: I received no assistance on this assignment that
                      violates the guidelines as set forth by the instructor
                      and the class syllabus.
References: (This should be a list of web sites, texts, and any other resources
            used as references for the assignment)
Comments: (This should be a note to the grader as to any problems or
           uncompleted aspects of the assignment)

**/
```

- The source code file should use **self-documenting code** and additional comments (as required) to improve code readability.

Lab Procedure:

- Use the examples in the text from Chapter 2 as a starting model for this exercise. Use the API documentation for the Graphics, Font and Color classes to provide additional insight into the graphics capabilities of the Graphics object in order to successfully implement the lab spec.
- Create a Java class that extends from (and therefore becomes an object of) the Applet class from the standard Java API.
- Create a Pareto Chart that represents the following data scenario:

You are performing a failure analysis on the C4 process used in the fabrication of a radiation-hardened CMOS device at an R&D facility. The C4 process involves the fabrication of contact points between a CMOS device and the package in which it will be deployed into a system. Upon examining 1000 CMOS devices, 250 were found to fail final testing due to one of 5 problems. The frequency for each failure code is as follows:

CF5	135
008	60
01A	30
235	15
AAF	10

The Pareto chart provides rectangular bars that represent the ordered raw data, and a data line that represents the cumulative percentage as you descend down the ordered raw data

- The example applet output is provided in Figure 1. Examine this output carefully. Your application should reproduce this output exactly.

Notes:

- The examples in the text provide a basis for the requisite implementation of this lab.
- Some specific implementation techniques may or may not exist in the standard API. You are expected to examine the API and identify those techniques that do exist and use them. For those aspects of the implementation that aren't readily implementable using available techniques, you are expected to devise creative work-around techniques to achieve the desired presentation detail.
- Presentation details to consider:
 - Differences in line thicknesses
 - Differences in font sizes
 - Differences in text orientation
 - Specific colors used
 - Specific font used for text
 - Exact positioning of labels

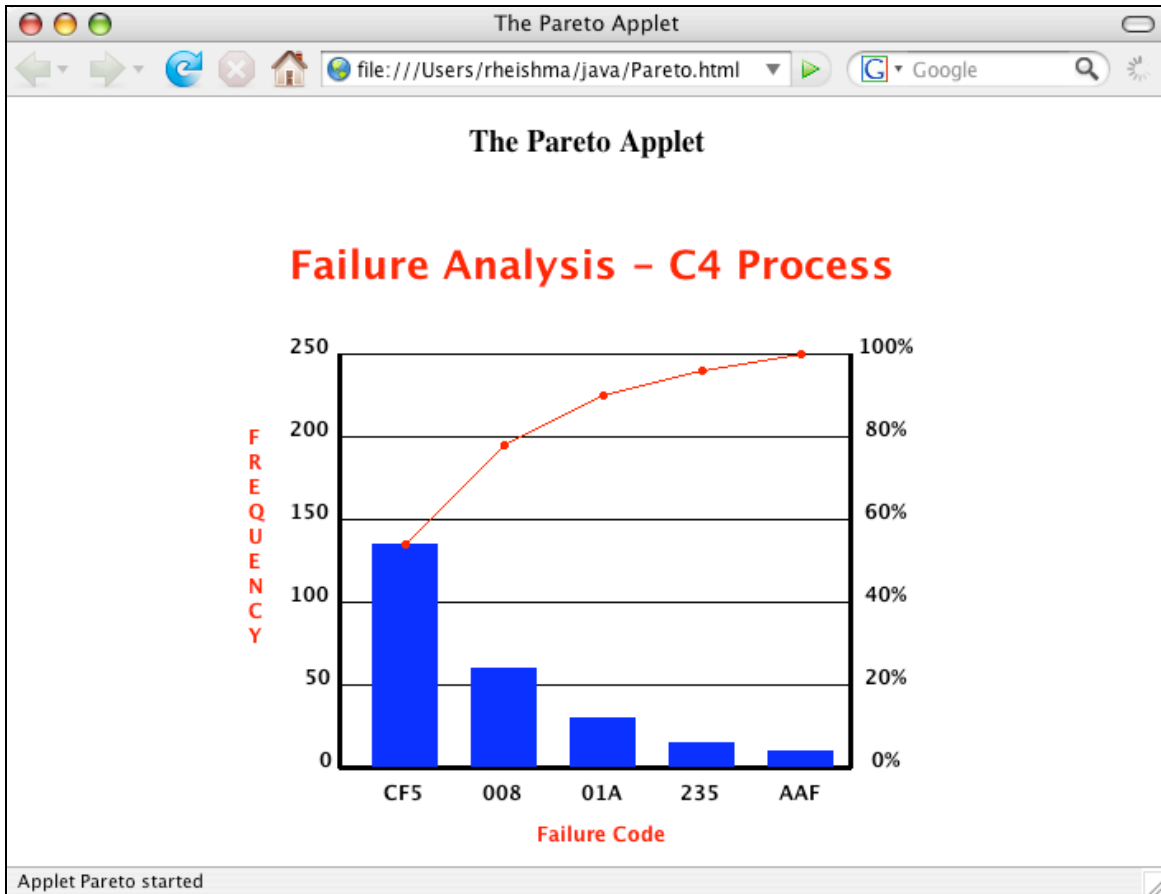


Figure 1 – Example applet displayed in a browser window

Grading Rubric: This assignment is worth 10 points and will be graded based on the following rubric:

Area	Exemplary	Competent	Developing	Points
Class Header	All header components are present, with references and comments that accurately support the state of the file.	All header components are present, but references and comments are incomplete or nonspecific.	Header is missing or only partially present, and references and comments are vague or unmeaningful.	__ / 2
Coding Style	Code implementation utilizes appropriate white space, self-documentation techniques and non-obvious comments.	Code implementation exhibits minor alignment or spacing problems, some comments are missing or redundant.	Significant alignment and spacing problems, comments are generally missing or sporadic.	__ / 2
Functionality / Creativity	The source and html files function to properly present applet in the browser and techniques were implemented to emulate expected output.	The source and html files function to present applet in the browser but there are deficiencies due to using only techniques provided in the examples from the text.	The applet will not properly load into the browser and/or there are errors generated during compilation or runtime.	__ / 3
Presentation	Applet visual output exactly matches the provided example.	All of the presentation features are present, but there are minor problems with fonts, colors, placement or alignment.	Presentation features are missing or exhibit significant problems with fonts, colors, placement or alignment.	__ / 3