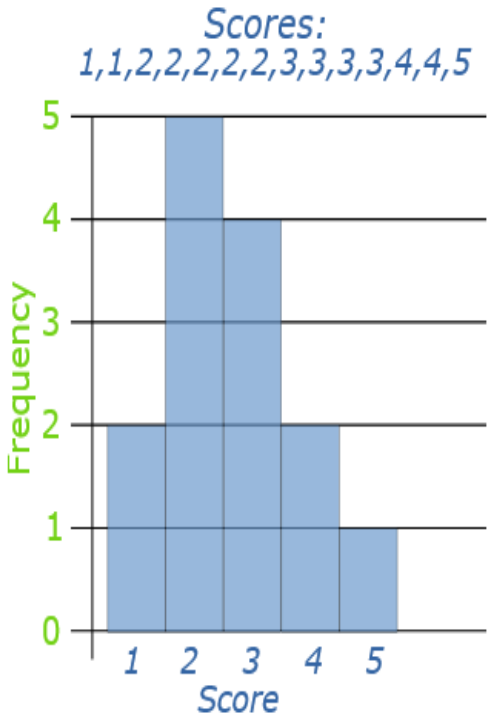
High Performance Computing
Assignment 3

Histogram

A **histogram** is an approximate representation of the distribution of numerical data. The term was first introduced by Karl Pearson To construct a histogram, the first step is to "bin" the range of values—that is, divide the entire range of values into a series of intervals—and then count how many values fall into each interval [1].

Frequency Histogram[2]

A Frequency Histogram is a special graph that uses vertical columns to show frequencies (how many times each score occurs):



Here I have added up how often 1 occurs (2 times),
how often 2 occurs (5 times), etc,
and shown them as a histogram.

Requirement

Given Data dataset with filename *dataset.txt* .you should implement histogram using MPIandOpenMPI

Description:
Assume that the dataset file contains group ages that watch your TV show. You want to do statistics about groups of age.

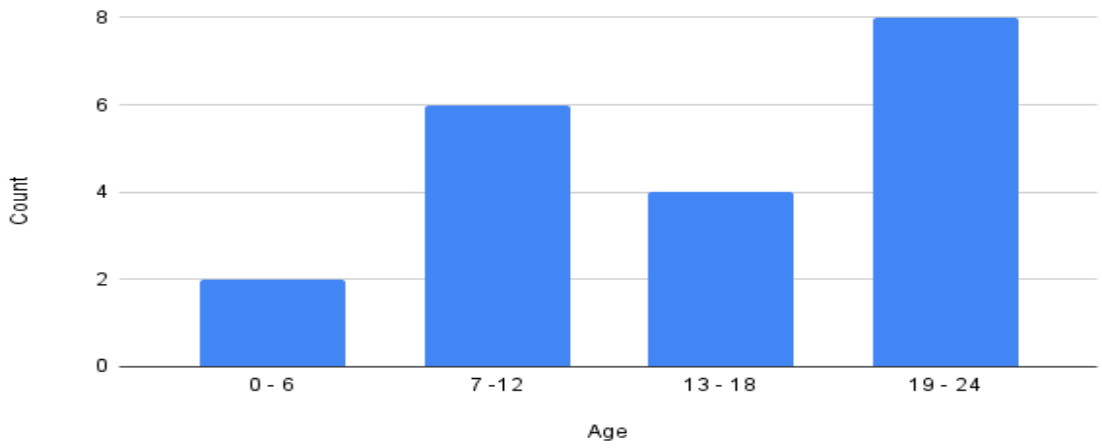
Code input:

1. **Number of bars**
2. **Number of points**
3. **Number of Threads**
4. **Number of Processes**

Code output:

```
The range start with 0, end with 6 with count 2
The range start with 6, end with 12 with count 6
The range start with 12, end with 18 with count 4
The range start with 18, end with 24 with count 8
```

From the above about we can found that the histogram will look like below:



Grading criteria

MPI and openMPI	
1. Reading file	15
2. Taking inputs	10
3. Divide input data	30
4. Collecting	30
5. Output	15
Total	100
Bonus: Using scatter/gather function in MPI for dividing the array	10

The grade includes:

1. Code format (must be formatted and well organized)
2. If your code is not running you will lose half of the grades
3. If your code doesn't show output you will lose ¼ grades

Delivery Notes:

- This is a group assignment of **3 members** . If you submit as a group of more than or less of 3 members, All the group members will get **zero**
- All students should work and fully understand everything in the submitted solution.
- No late submission is allowed.
- Submissions will be on the blackboard. It is your duty to ensure that your submission was properly uploaded to the blackboard after you finish submitting it. If your submission was not uploaded properly while marking, you will not receive a grade for the assignment.
- No submission through e-mails.
- You will put your code .c file and your data in a folder named **CS371_Assign3_firstStudentID_secondStudentID_thirdStudentID** and compress them to a .zip file with the same folder name. The compressed file would be the file to be delivered.
- Failing to abide by the naming convention of the file or failing to submit the files as per the requested extension, would result in a **zero** for all team members.
- In case of **cheating** you will get a **negative grade** whether you give your solution to someone, take the solution from someone/internet, or even send it to someone for any reason.
- If the team or any member didn't attend the discussion without formal excuse before the discussion time the whole team will get **zero grade.**
- Due Date **21/05/2022**