The University of Melbourne
CVEN30008 Engineering Risk Analysis

Monte Carlo Simulation

1. **A simply supported timber beam of length 10 m is loaded with a central load P with μ_S= 5 kN and σ_S= 2 kN. Using MATLAB, run Monte Carlo Simulation to generate:**
   - **10 load values,**
   - **100 load values,**
   - **1,000 load values.**

   Compare their histograms to infer any differences in the simulations.

   Solutions:

   Generate the following load random variables: μ_S= 5 kN and σ_S= 2 kN.

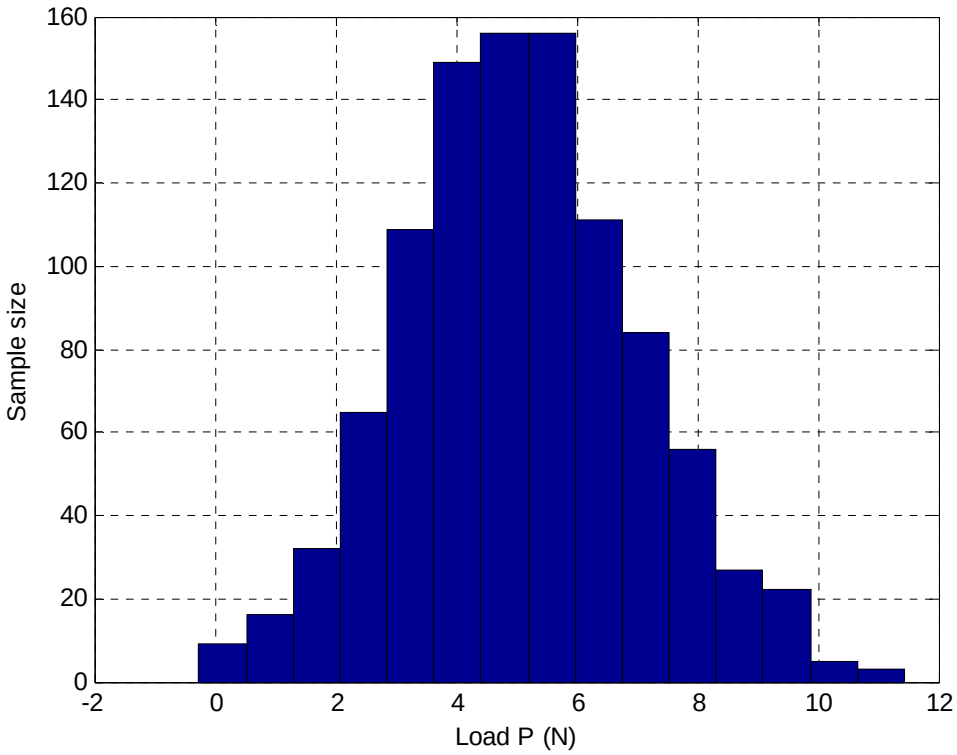
```
%Monte Carlo simulation with histogram

clear all;
close all;
clc;

% generate sample
rng(123456);     %specifiy random seed
mu = 5;          %mean
sigma = 2;       %standard deviation
size = 1000;     %sample size

r = mu + sigma.*randn(size,1);     %generate sample mu and sigma

% generate histogram
hist(r,15);
xlabel('Load P (N)');
ylabel('Sample size');
grid on;
```


160
140
120
100
80
60
40
20
0
Sample size
-2
0
2
4
6
8
10
12
Load P (N)