```matlab
% A simplified example for simulation decomposition
% Monte Carlo simulation

n=100000; % number of runs
var1=0+100*rand(n,1); % uncertain variable with uniform distribution [0 100]
var2=0+150*rand(n,1); % uncertain variable with uniform distribution [0 150]
result=var1+var2; % resulting variable
```
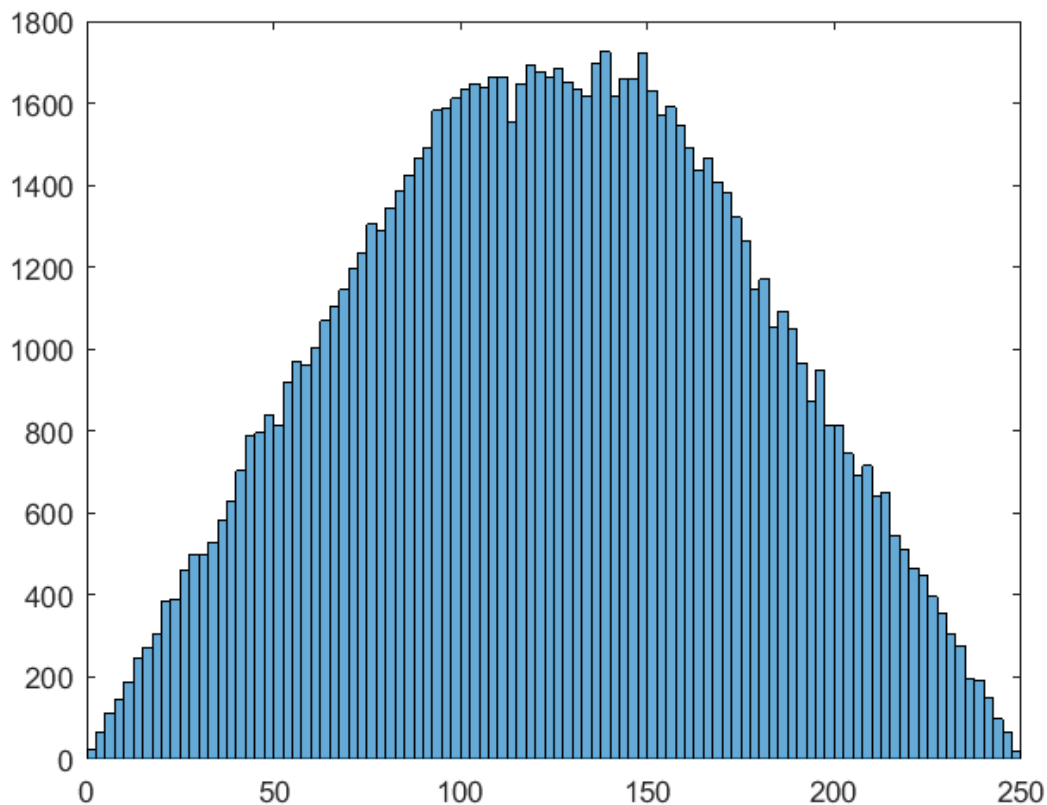
Simple probability distribution

```matlab
figure
histogram(result,100)
```


Simulation decomposition

setting scenarios

let var1 have two states low [0 50] && high (50 100] and var2 three: low [0 50] && medium (50 100] && high (100 150]

```matlab
sc=zeros(n,1);
sc=((var2<=50)+(var2>50&var2<=100)*2....
    +(var2>100)*3)+(var1>50)*3;

% colors
color=[0 .8 1; 0 .6 1; 0 .4 1;...
       1 .8 .4; 1 .6 .4; 1 .4 .4];

% legend
legends={'low var1 & low var2','low var1 & medium var2','low var1 & high var2',....
         'high var1 & low var2','high var1 & medium var2','high var1 & high var2'};
```
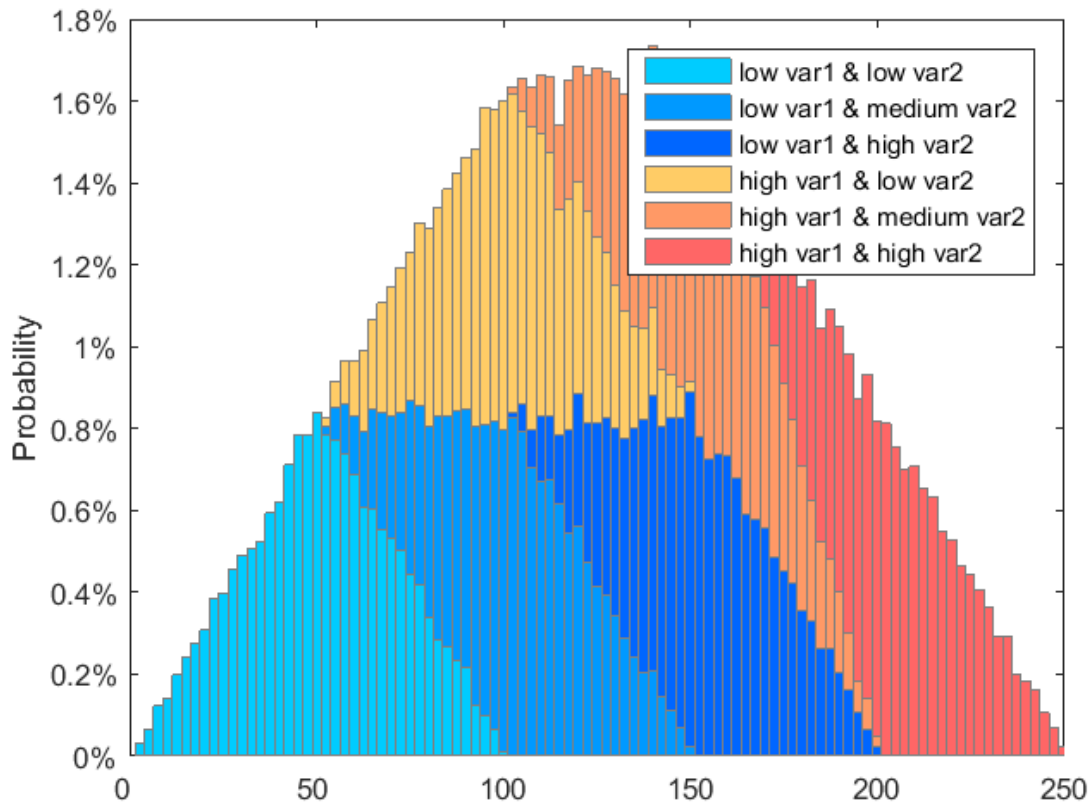
```
% building the graph
sm = simdec(result,sc,color,legends,[]);
```