To create the model, first the differential equations were derived. The derivation is attached with the project.

The values for the parameters are assumed to be:

m1 = 2000;

k1 = 16000;

b = 3000;

k2 = 60000;

m2 = 20;

These values are taken with reference from the artifact “suspension\_values.pdf”, to mimic the actual values of the suspension systems used in vehicles.

To generate the forces applied on the tire from the road, the artifact “MITOCW – Acceleraton produced due to speed bumps.pdf” is used.  
This pdf presents the forces that would be applied on the tire due to speed breakers.   
  
Since in normal driving conditions, the road forces aren’t as high as speed bumps, the acceleration produced due to the road wouldn’t be as high as speed bumps. It is assumed that the road conditons produce half of the acceleration as compared to that of the bumps.  
  
This acceleration value is multiplied by the mass of the vehicle to generate the road forces.  
  
In the model, a random number generator is used to mimic the road forces.