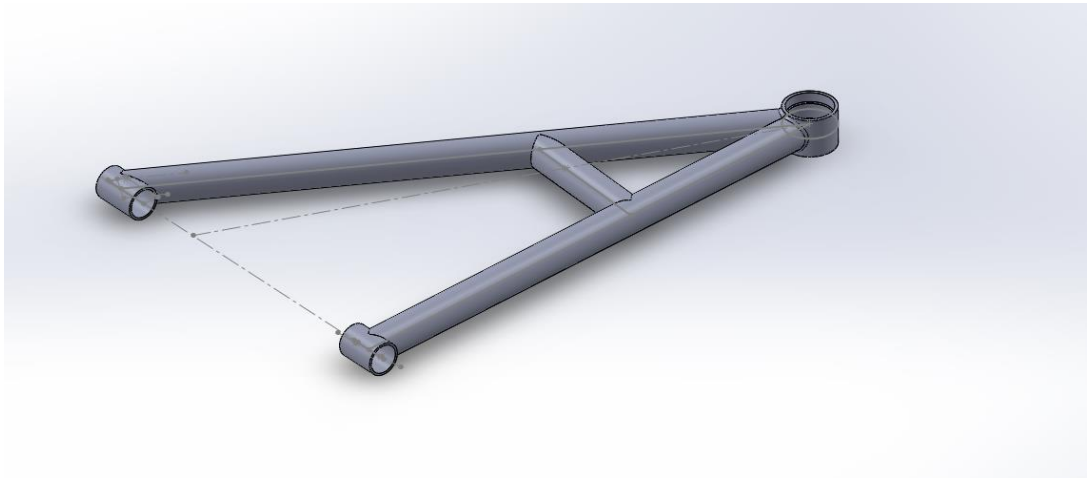
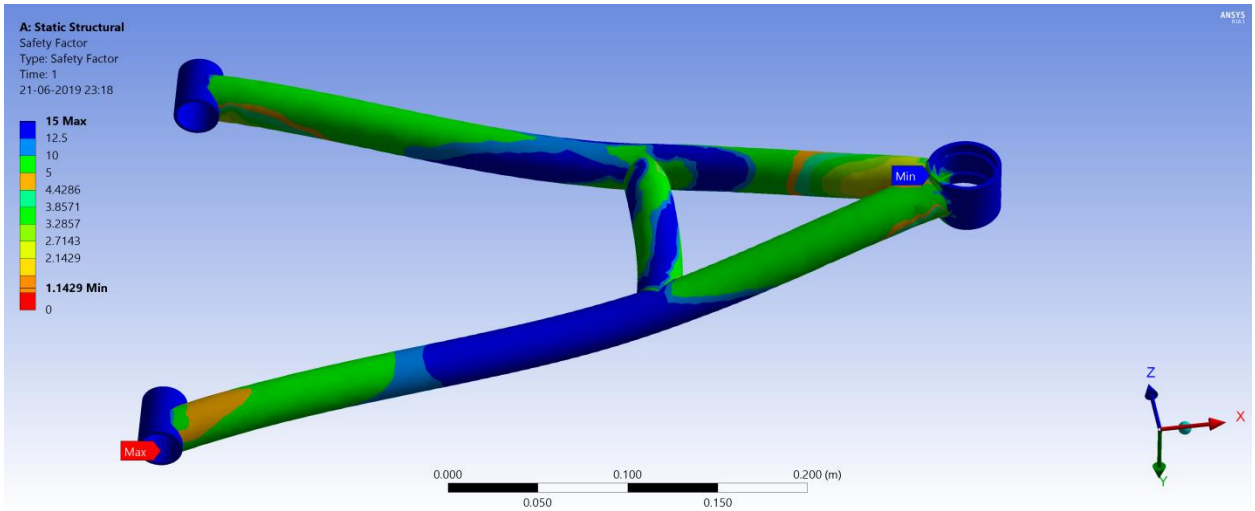
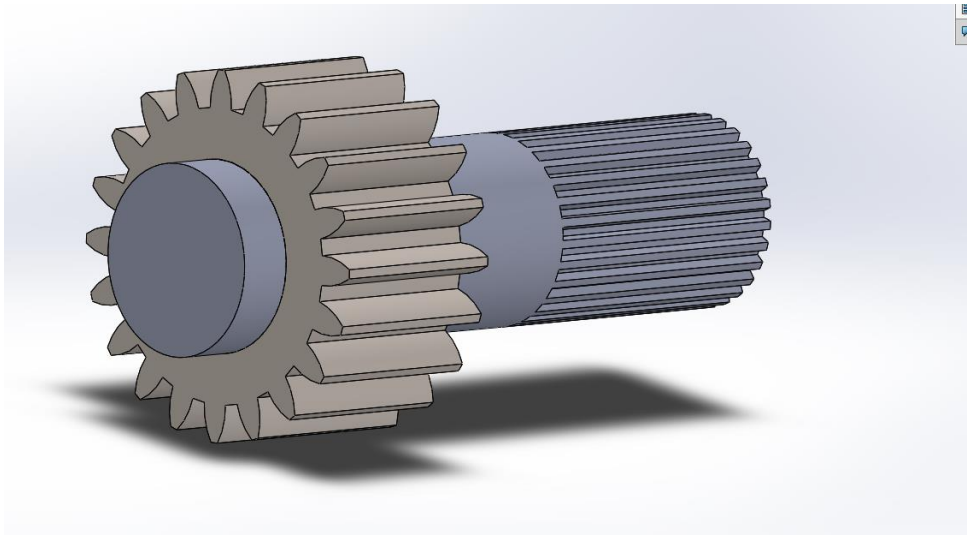
Report- Siddharth Satyam

- 
- 

Factor of Safety came out to be 1.14 (min) in the worst case.

- For rack and pinion,
  Rack length= 300.26 mm
  Rack travel= 90 mm
  module= 1.75
  number of teeth= 20
  pitch diameter= 20 * 1.75= 35 mm
  Lock to lock angle = 294.66 degrees



- By torque balancing about kingpin axis,
  Force on center of wheel * spindle length =Steering arm length* cos(beta) * F
  Thus, F = 3657 N

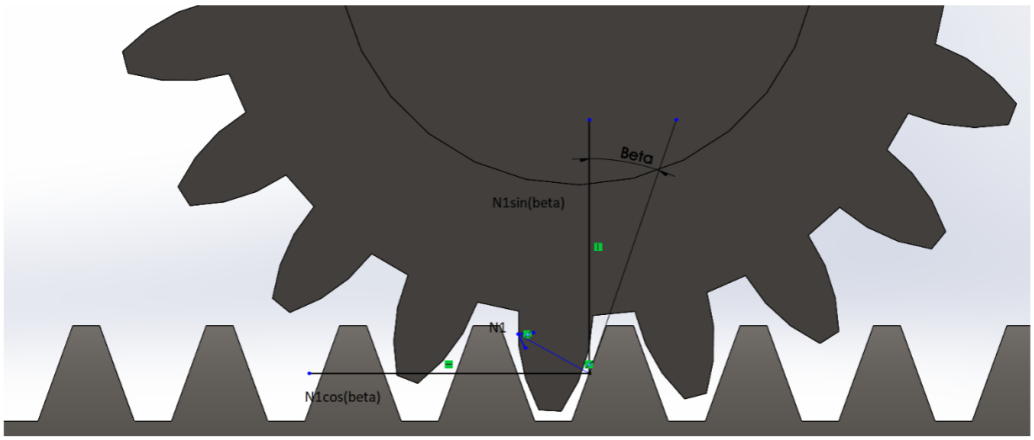
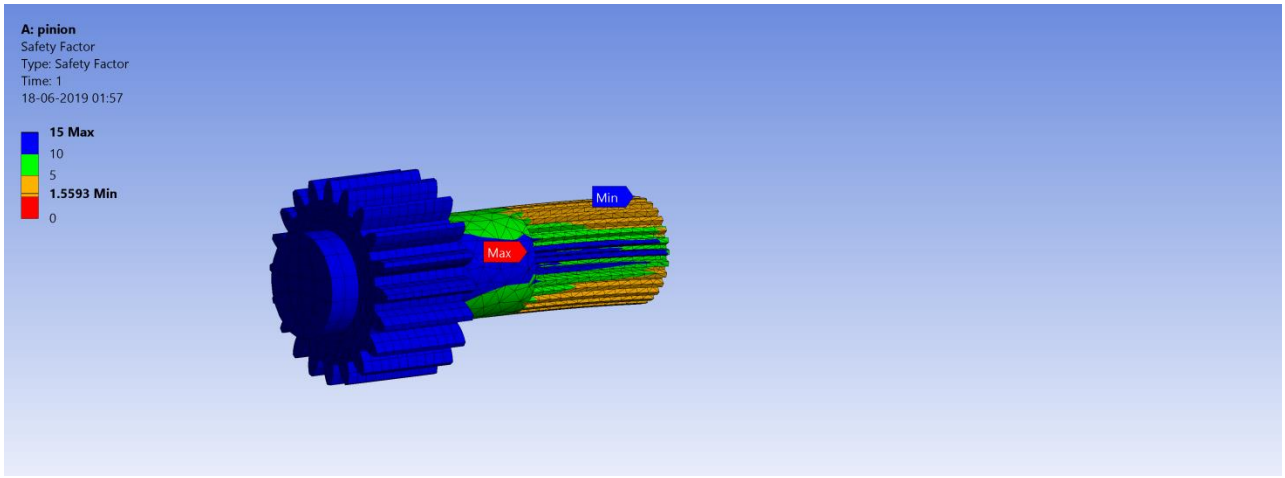
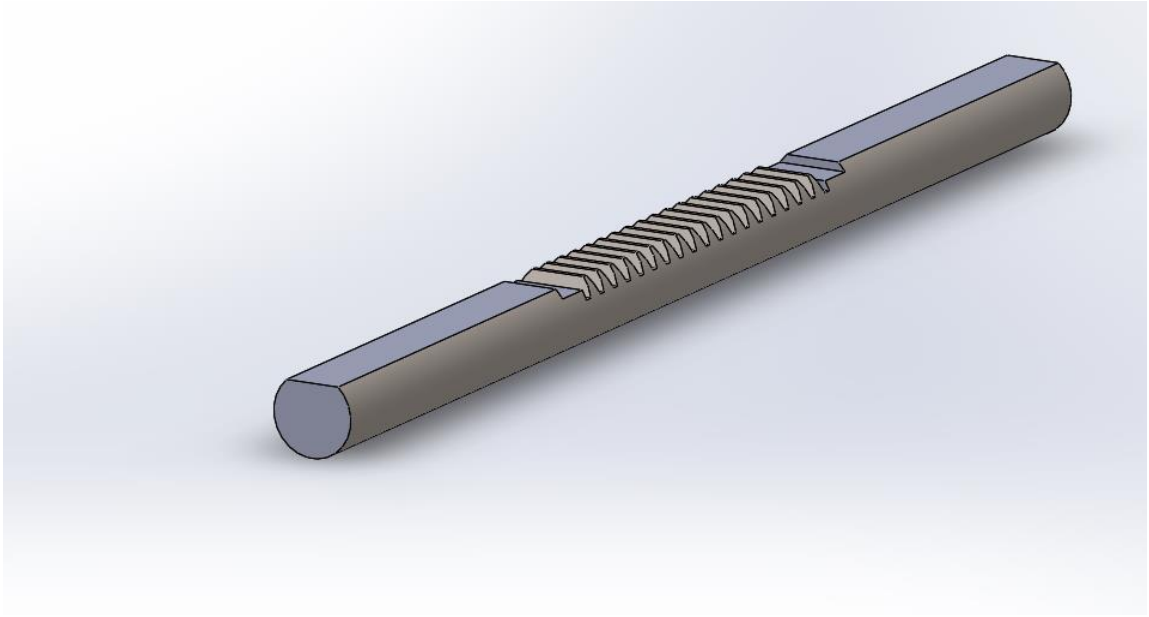


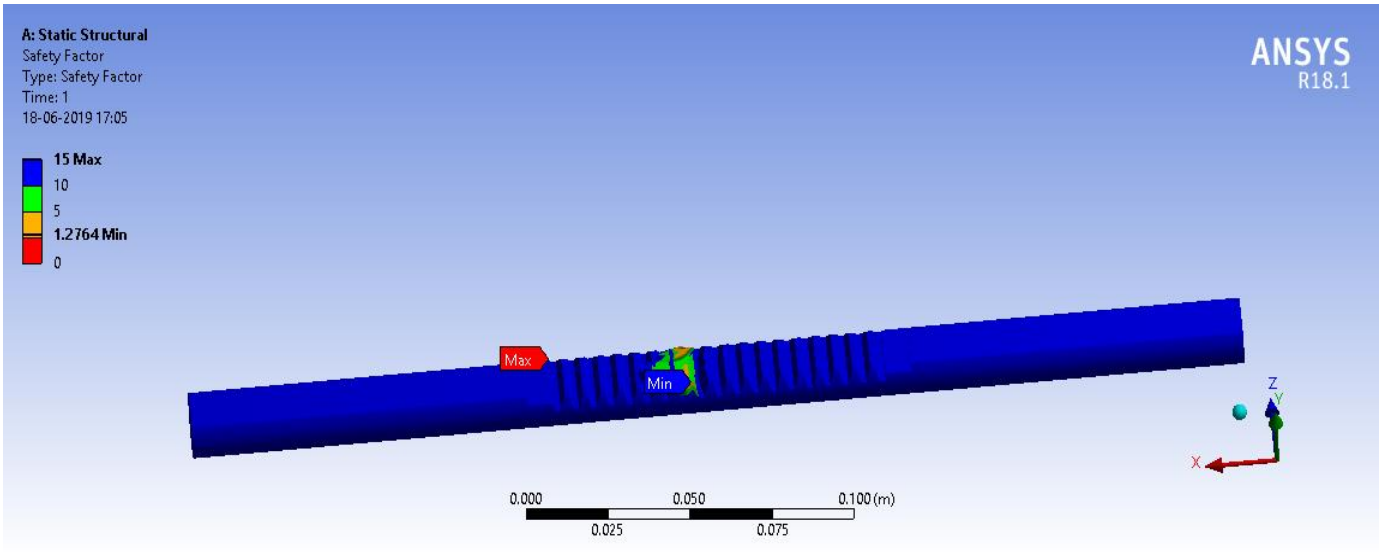
Figure 39: Basic force diagram of teeth's

- F = N1*cos(beta)
  Thus , N1*sin(beta)= 1331.14N
  Thus, Radial force= 1331.14N
  Tangential force= 3657 N



- 

Same forces that were applied on pinion had to be applied on the rack as well.

- 
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Safety Factor
Type: Safety Factor
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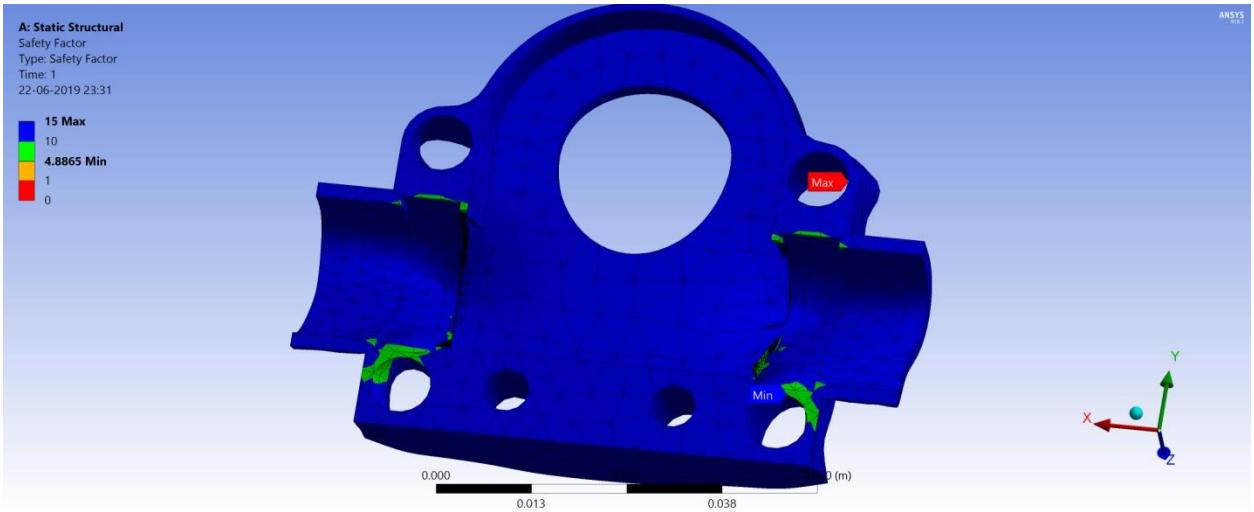
18-06-2019 17:05
15 Max
10
5
1.2764 Min
0
ANSYS
R18.1
Max
Min
Z
Y
X
0.000
0.050
0.100 (m)
0.025
0.075
- 
A: Static Structural
Safety Factor
Type: Safety Factor
Time: 1
22-06-2019 23:31
15 Max
10
4.8865 Min
1
0
Max
Min
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Z
0.000
0.013
0.038