In[]:=
```
SetDirectory[
  "C:/Users/serha/OneDrive/Masaüstü/MyRepo/master_thesis_MMT003/210421_OR_model_and
    _other_lines_sliding"];
```

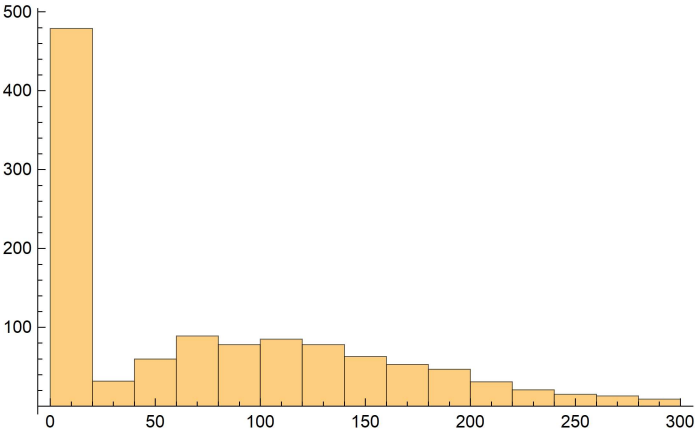
In[]:=
```
datafull = Import["../data/PLTCM_num.csv", HeaderLines → 2];
datafull[[1]]
Dimensions@datafull
```

Out[]=
```
{3681, 8, 18000721-03000, 327 571, 4, 26, 1222.64, 4.48514, 1.10517, 1351.22, 19.0359,
 1802.82, 75.8486, 120, 2.68249, , 0, , 2, 207 254, 0, 678.897, 1, 1224.67, 05.01.18 17:04,
 1.10509, 0, NOOIL, , 1, 606, 421, 317, 4.48514, 1262.69, 438.601, 1222.64, 1772}
```

Out[]=
```
{86 222, 38}
```

In[]:=
```
Histogram@Values@Counts@datafull[[All, 1]]
```

Out[]=

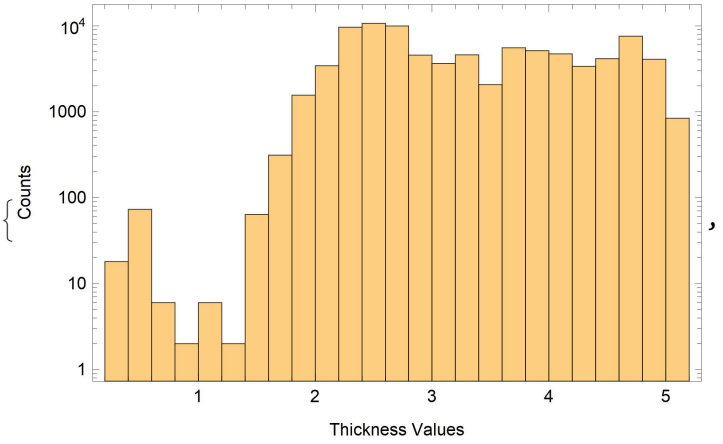


In[]:=
```
nullpos = Position[datafull[[All, 34]], _?(Head@# == String &)];
datafull = Delete[datafull, nullpos];
```

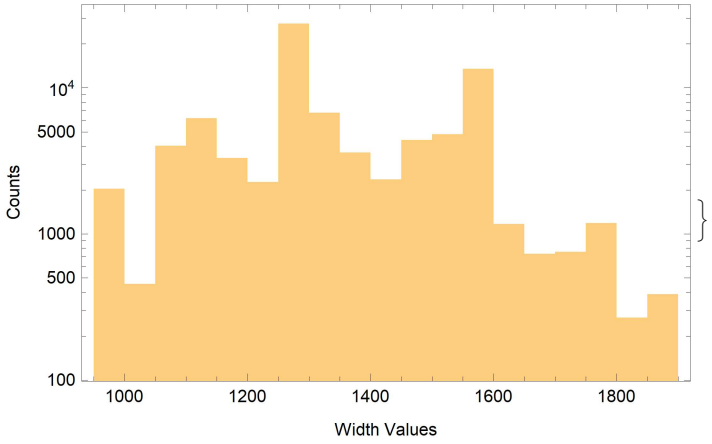
In[]:=
```
mostlyzeropos = Position[datafull[[All, 11]], _?(# == 0 &)][[{2, 3}]];
datafull = Delete[datafull, mostlyzeropos];
```

In[ ]:=
```
{Histogram[datafull[[All, 34]], ScalingFunctions → "Log", PlotRange → Full,
  Frame → True, FrameLabel → {"Thickness Values", "Counts"}, ImageSize → Medium],
 Histogram[datafull[[All, 35]], ScalingFunctions → "Log", PlotRange → Full,
  Frame → True, FrameLabel → {"Width Values", "Counts"}, ImageSize → Medium]}
```

Out[ ]=



,



In[ ]:=
```
datafull[[Flatten@Position[datafull[[All, 11]], _?Negative], 11]] *= (-1);
```

In[ ]:=
```
density[thick_, width_, length_, weight_] := N@weight / (thick * width * length);
```

In[ ]:=
```
thickvaluesthkpos = datafull[[All, 34]];
widthvaluesthkpos = datafull[[All, 35]];
lengthvaluesthkpos = datafull[[All, 36]];
weightvaluesthkpos = datafull[[All, 11]];
densities = Quiet@Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
     lengthvaluesthkpos[[i]], weightvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
densities = densities /. {Indeterminate → 0., ComplexInfinity → 0.};
KeySort@Counts@densities
```

Out[ ]=
$\langle | 0. \to 20,\ 9.76762 \times 10^{-13} \to 1,\ 1.2917 \times 10^{-11} \to 1,\ 1.35301 \times 10^{-11} \to 1,\ 1.64027 \times 10^{-11} \to 1,$
$2.53845 \times 10^{-11} \to 1,\ 2.67805 \times 10^{-11} \to 1,\ 4.91618 \times 10^{-11} \to 1,\ 1.09961 \times 10^{-10} \to 1,$
$1.15293 \times 10^{-10} \to 1,\ 1.2598 \times 10^{-10} \to 1,\ 1.40149 \times 10^{-10} \to 1,$ ⋯ 84 777 ⋯,
$8.19799 \times 10^{-6} \to 1,\ 8.292 \times 10^{-6} \to 1,\ 8.30866 \times 10^{-6} \to 1,\ 8.69227 \times 10^{-6} \to 1,$
$8.82013 \times 10^{-6} \to 1,\ 9.15675 \times 10^{-6} \to 1,\ 9.25153 \times 10^{-6} \to 1,\ 0.0000111412 \to 1,$
$0.0000112619 \to 1,\ 0.0000145131 \to 2,\ 0.0000352052 \to 1,\ 0.00422551 \to 2 | \rangle$

large output | show less | show more | show all | set size limit...

In[ ]:=
```
(* datafull=datafull[[Flatten@Position[densities,_?(0<#<0.0001&)]]]; *)
```

In[ ]:=
```
datafull =
  datafull[[Flatten@Position[densities, _?(6.5 * 10^(-6) < # < 8.5 * 10^(-6) &)]]];
```

In[ ]:=
```
thickvaluesthkpos = datafull[[All, 34]];
widthvaluesthkpos = datafull[[All, 35]];
lengthvaluesthkpos = datafull[[All, 36]];
weightvaluesthkpos = datafull[[All, 11]];
densities = Quiet@Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
     lengthvaluesthkpos[[i]], weightvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
densities = densities /. {Indeterminate → 0., ComplexInfinity → 0.};
```

In[ ]:=
```
Length@densities
Length@Position[densities, _?(# ≤ 6.5 * 10^(-6) &)]
Length@Position[densities, _?(8.5 * 10^(-6) ≤ # < 0.0001 &)]
Length@Position[densities, _?(6.5 * 10^(-6) ≤ # < 8.5 * 10^(-6) &)]
```

Out[ ]= 65 041

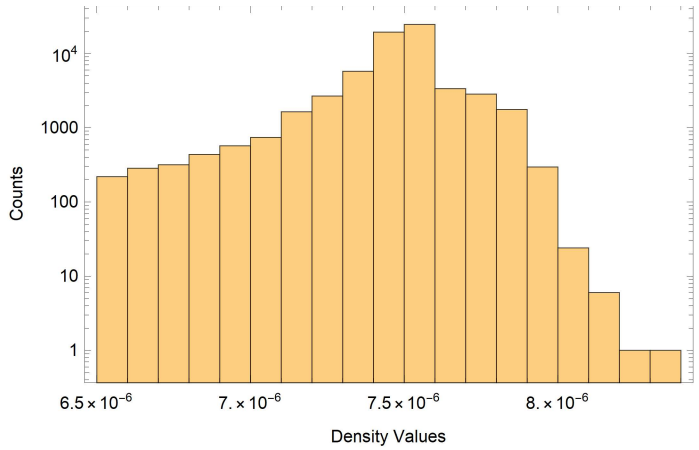
Out[ ]= 0

Out[ ]= 0

Out[ ]= 65 041

In[ ]:=
```
Histogram[densities, ScalingFunctions → "Log", PlotRange → Full,
 Frame → True, FrameLabel → {"Density Values", "Counts"}, ImageSize → Medium]
```

Out[ ]=



In[ ]:=
```
datafull = Delete[datafull, Position[datafull[[All, 25]], ""]];
```

In[ ]:=
```
secondscolumn =
  Table[AbsoluteTime[{datafull[[i, 25]], {"Day", ".", "Month", ".", "YearShort",
      " ", "Hour", ":", "Minute"}}], {i, Length@datafull}];
datafull = Join[datafull, Partition[secondscolumn, 1], 2];
datafullsorted = Sort[datafull, #1[[1]] < #2[[1]] &];
```

Deletion of sequences less than 50

In[ ]:=
```
deletepos4 = Flatten@Table[Position[datafullsorted[[All, 1]], i],
    {i, Keys@Cases[Normal@Counts@datafullsorted[[All, 1]], _?(Values[#] < 50 &)]}];
datafullsorted = Delete[datafullsorted, Partition[deletepos4, 1]];
```

In[ ]:=
```
Dimensions@datafullsorted
```

Out[ ]= {59 604, 39}

In[ ]:=
```
programids = DeleteDuplicates@datafullsorted[[All, 1]];
Length@programids
datafullsortedfinal =
  Flatten[Table[Sort[Select[datafullsorted, #[[1]] == i &], #1[[39]] < #2[[39]] &],
    {i, programids}], 1];
Dimensions@datafullsortedfinal
```

Out[ ]= 524

Out[ ]= {59 604, 39}

In[ ]:=
```
datafullsortedfinal[[1]]
```

Out[ ]= {3609, 8, 17169021-06000, 319 652, 4, 38, 1472.14, 2.51248,
 0.468514, 689.719, 18.2915, 3427.1, 76.5568, 31.2446, 2.11253, , 0, , 2,
 207 148, 0, 713.984, 1, 1473.2, 29.12.17 18:19, 0.468521, 0, QUAKEREGL1, ,
 1, 610, 331, 241, 2.51248, 1535.35, 620.727, 1472.14, 3302, 3 723 560 340}

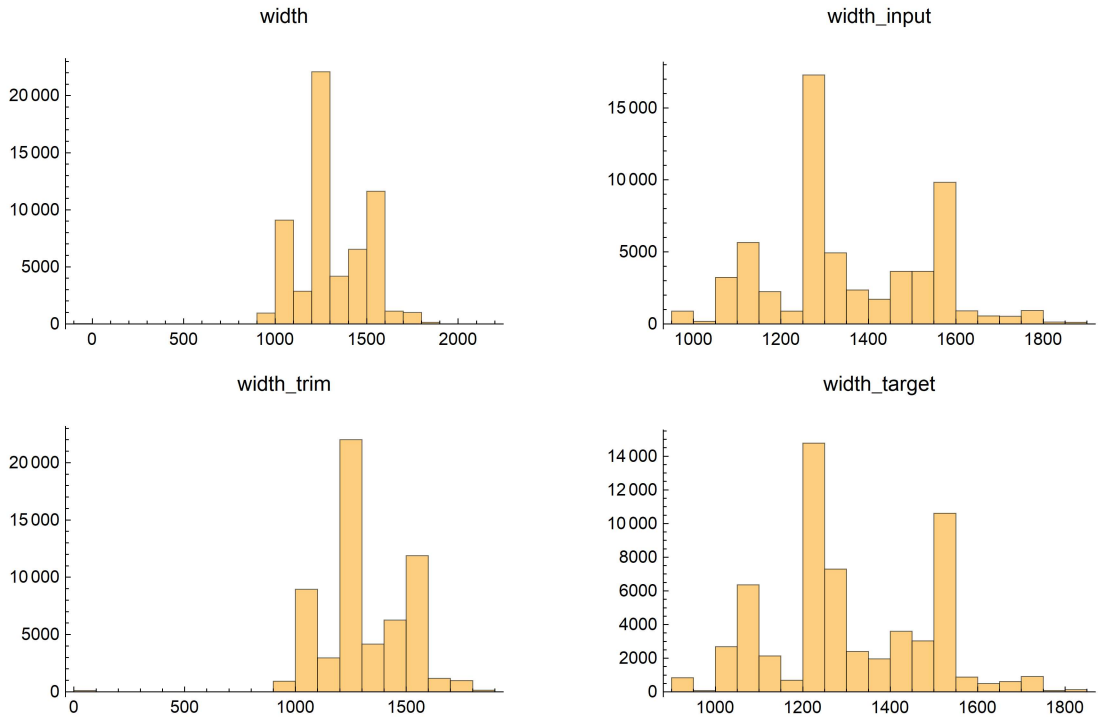
In[ ]:=
```
datafullsortedfinal[[All, 7]] == datafullsortedfinal[[All, 35]]
datafullsortedfinal[[All, 7]] == datafullsortedfinal[[All, 37]]
```

Out[ ]= False

Out[ ]= False

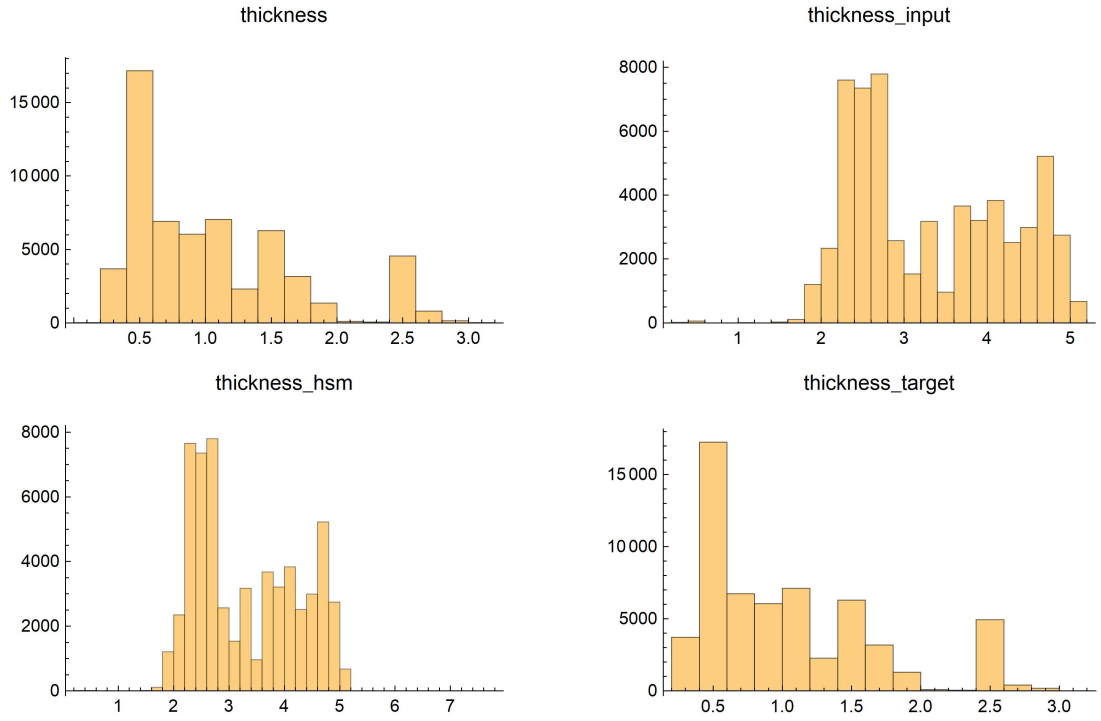
In[ ]:=
```
GraphicsGrid[{{Histogram[datafullsortedfinal[[All, 7]], PlotLabel → "width"],
    Histogram[datafullsortedfinal[[All, 35]], PlotLabel → "width_input"]},
   {Histogram[datafullsortedfinal[[All, 24]], PlotLabel → "width_trim"],
    Histogram[datafullsortedfinal[[All, 37]], PlotLabel → "width_target"]}}]
```

Out[ ]=



In[ ]:=
```
GraphicsGrid[{{Histogram[datafullsortedfinal[[All, 9]], PlotLabel → "thickness"],
   Histogram[datafullsortedfinal[[All, 34]], PlotLabel → "thickness_input"]},
  {Histogram[datafullsortedfinal[[All, 8]], PlotLabel → "thickness_hsm"],
   Histogram[datafullsortedfinal[[All, 26]], PlotLabel → "thickness_target"]}}]
```

Out[ ]=



In[ ]:=
```
data =
  Join[Partition[Range@Length@datafullsortedfinal, 1], datafullsortedfinal[[All, {1}]],
   ConstantArray[{0, 0, 0, 0, 0, 0}, Length@datafullsortedfinal], datafullsorted[[
    All, {35, 34, 25, 39}]], ConstantArray[{0}, Length@datafullsortedfinal],
   datafullsorted[[All, {6, 26, 37, 8, 9, 24, 7, 4, 3, 11, 12, 36}]], 2];
```

In[ ]:=
```
data[[1]]
```

Out[ ]=
```
{1, 3609, 0, 0, 0, 0, 0, 0, 1264.04, 2.55459, 30.12.17 02:14,
 3 723 588 840, 0, 26, 0.477622, 1222.64, 2.55459, 0.477354, 1224.67,
 1222.64, 318 580, 17167961-03000, 13.5754, 2998.57, 543.956}
```

In[ ]:=
```
Dimensions@data
```

Out[ ]=
```
{59 604, 25}
```

In[ ]:=
```
(* Export["pltcm_manipulated_64026.csv",data] *)
```

In[ ]:=
```
Export["../data/pltcm_manipulated_59604_rev1.csv", data];
```