```mathematica
In[•]:= SetDirectory[
          "C:/Users/serha/OneDrive/Masaüstü/MyRepo/master_thesis_MMT003/210224_impacts_in_time
            _windows"];
```

```mathematica
In[•]:= datafull = Import["../data/ccm1_data_modified.csv", HeaderLines → 2];
```

```mathematica
In[•]:= datafull[[1]]
```

Out[•]= $\{1, 122, 115\,686, CCM1, 14.12.16, 16000181-04, 148\,956,$
        $\#NAME?, 1.24 \times 10^6, 87, 2.74 \times 10^9, 3.35 \times 10^9, 16\,000\,181, 26, 0, 0\}$
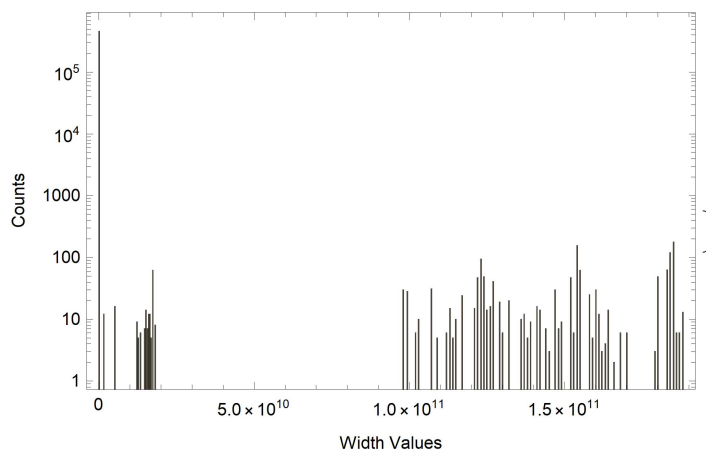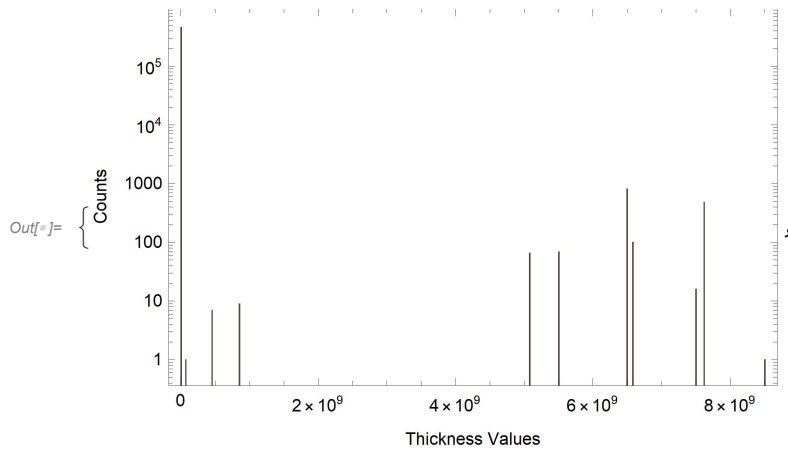
```mathematica
In[•]:= Dimensions@datafull
```

Out[•]= $\{459\,203, 16\}$

```mathematica
In[•]:= {Histogram[datafull[[All, 10]], ScalingFunctions → "Log", PlotRange → Full,
          Frame → True, FrameLabel → {"Thickness Values", "Counts"}, ImageSize → Medium],
        Histogram[datafull[[All, 9]], ScalingFunctions → "Log", PlotRange → Full,
          Frame → True, FrameLabel → {"Width Values", "Counts"}, ImageSize → Medium]}
```

Out[•]= {

,

}

```mathematica
In[•]:= datafullnoNA = datafull /. "NA" → 0;
```

```mathematica
In[•]:= thickpos = Position[RealDigits[datafullnoNA[[All, 10]]][[All, 2]], _? (# == 2 &)];
```

```
In[ ]:= Length@thickpos
```

```
Out[ ]= 396 299
```

```
In[ ]:= datafullnoNA[[
          Flatten@thickpos[[Flatten@Position[RealDigits[datafullnoNA[[Flatten@thickpos, 9]]][[
              All, 2]], _?(# == 12 &)]]], 11]] = "NA";
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[
              datafullnoNA[[Flatten@thickpos, 9]]][[All, 2]], _?(# == 12 &)]]], 12]] = "NA";
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[
              datafullnoNA[[Flatten@thickpos, 9]]][[All, 2]], _?(# == 12 &)]]], 10]] = "NA";
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[
              datafullnoNA[[Flatten@thickpos, 9]]][[All, 2]], _?(# == 12 &)]]], 9]] = "NA";
```

```
In[ ]:= datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= datafullnoNA[[
          Flatten@thickpos[[Flatten@Position[RealDigits[datafullnoNA[[Flatten@thickpos, 9]]][[
              All, 2]], _?(# == 7 &)]]], 11]] /= 10^5;
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[
              datafullnoNA[[Flatten@thickpos, 9]]][[All, 2]], _?(# == 7 &)]]], 12]] /= 10^5;
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[
              datafullnoNA[[Flatten@thickpos, 9]]][[All, 2]], _?(# == 7 &)]]], 9]] /= 10^3;
```

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

```
In[ ]:= (* KeySort@Counts@datafullnoNA[[Flatten@thickpos[[Flatten@Position[
          RealDigits[datafullnoNA[[Flatten@thickpos,9]]][[All,2]],_?(#≤4&)]]],9]] *)
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
        widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
        weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
        lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
```

In[ ]:= `densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],`
`weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];`
`densities = densities /. Indeterminate → 0;`

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

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⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

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⋯ **General**: Further output of Power::infy will be suppressed during this calculation.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **General**: Further output of Infinity::indet will be suppressed during this calculation.

In[ ]:= `KeySort@Counts@densities`

Out[ ]=
⟨| $-0.0003581 \to 6$, $0 \to 39$, $0. \to 7$, $7.37584 \times 10^{-14} \to 8$, $7.40346 \times 10^{-14} \to 8$,
$7.42935 \times 10^{-14} \to 6$, $7.44644 \times 10^{-14} \to 7$, $7.45616 \times 10^{-14} \to 12$, $7.46385 \times 10^{-14} \to 4$,
$7.46423 \times 10^{-14} \to 7$, $7.47016 \times 10^{-14} \to 14$, $7.47024 \times 10^{-14} \to 7$, $7.47863 \times 10^{-14} \to 6$,
$7.48139 \times 10^{-14} \to 6$, ⋯ 17 447 ⋯ , $763.725 \to 6$, $763.826 \to 16$, $763.942 \to 7$,
$764.038 \to 7$, $764.203 \to 7$, $764.874 \to 7$, $765.515 \to 7$, $766.12 \to 24$, $767.356 \to 7$,
$784.85 \to 7$, $785.532 \to 6$, $815.893 \to 13$, $817.867 \to 7$, $827.775 \to 6$ |⟩

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

In[ ]:= `RealDigits@7.397848389825049` `*^-7`

Out[ ]= `{{7, 3, 9, 7, 8, 4, 8, 3, 8, 9, 8, 2, 5, 0, 4, 9}, -6}`

In[ ]:= `N@density[76, 1640, 38 400, 40 300]`

Out[ ]= 7.64485×10^{-6}

In[ ]:= `table1 = datafullnoNA[[Flatten@`
`thickpos[[Flatten@Position[RealDigits[densities][[All, 2]], _?(# == -13 &)]]], {1,`
`9, 10, 11, 12, 13}]];`

In[ ]:= `datafullnoNA[[table1[[Flatten@`
`Position[RealDigits[table1[[All, 5]]][[All, 2]], _?(# == 5 &)], 1]], 11]] *= 10^8;`
`datafullnoNA[[table1[[Complement[Range@Length@table1, Flatten@`
`Position[RealDigits[table1[[All, 5]]][[All, 2]], _?(# == 5 &)], 1]], 12]] /= 10^4;`
`datafullnoNA[[table1[[Complement[Range@Length@table1, Flatten@`
`Position[RealDigits[table1[[All, 5]]][[All, 2]], _?(# == 5 &)], 1]], 11]] *= 10^4;`

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
       widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
       weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
       lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
       densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
            weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
       densities = densities /. Indeterminate → 0;
       KeySort@Counts@densities
```

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

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⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **General**: Further output of Power::infy will be suppressed during this calculation.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
⟨| -0.0003581 → 6, 0 → 39, 0. → 7, 7.61481 × 10⁻¹³ → 6, 7.33946 × 10⁻¹¹ → 7,
  7.42199 × 10⁻¹¹ → 18, 7.42908 × 10⁻¹¹ → 113, 7.43068 × 10⁻¹¹ → 6, 7.43192 × 10⁻¹¹ → 8,
  7.43213 × 10⁻¹¹ → 18, 7.44576 × 10⁻¹¹ → 7, 7.46484 × 10⁻¹¹ → 9, 7.52724 × 10⁻¹¹ → 12,
  7.52992 × 10⁻¹¹ → 6, ⋯ 17 379 ⋯ , 763.725 → 6, 763.826 → 16, 763.942 → 7,
  764.038 → 7, 764.203 → 7, 764.874 → 7, 765.515 → 7, 766.12 → 24, 767.356 → 7,
  784.85 → 7, 785.532 → 6, 815.893 → 13, 817.867 → 7, 827.775 → 6 |⟩

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

```
In[ ]:= table2 =
         N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
             _?(# == -10 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table2[[Flatten@
             Position[RealDigits[table2[[All, 5]]][[All, 2]], _?(# == 5 &)], 1]], 11]] *= 10^5;
       datafullnoNA[[table2[[Complement[Range@Length@table2, Flatten@
             Position[RealDigits[table2[[All, 5]]][[All, 2]], _?(# == 5 &)]], 1]], 12]] /= 10^5;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
       widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
       weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
       lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
       densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
           weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
       densities = densities /. Indeterminate → 0;
       KeySort@Counts@densities
```

··· Power: Infinite expression $\dfrac{1}{0.}$ encountered.

··· Infinity: Indeterminate expression 0. ComplexInfinity encountered.

··· Power: Infinite expression $\dfrac{1}{0.}$ encountered.

··· Infinity: Indeterminate expression 0. ComplexInfinity encountered.

··· Power: Infinite expression $\dfrac{1}{0.}$ encountered.

··· General: Further output of Power::infy will be suppressed during this calculation.

··· Infinity: Indeterminate expression 0. ComplexInfinity encountered.

··· General: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle\,|\,-0.0003581 \to 6,\ 0 \to 39,\ 0. \to 7,\ 7.61481\times10^{-13} \to 6,\ 6.9973\times10^{-10} \to 8,$
$7.13662\times10^{-10} \to 8,\ 7.14097\times10^{-10} \to 6,\ 7.19109\times10^{-10} \to 7,\ 7.19364\times10^{-10} \to 8,$
$7.21697\times10^{-10} \to 7,\ 7.24491\times10^{-10} \to 5,\ 7.24668\times10^{-10} \to 6,\ 7.24685\times10^{-10} \to 7,$
$7.26247\times10^{-10} \to 5,$ 〈 ··· 17367 ··· 〉, $763.725 \to 6,\ 763.826 \to 16,\ 763.942 \to 7,$
$764.038 \to 7,\ 764.203 \to 7,\ 764.874 \to 7,\ 765.515 \to 7,\ 766.12 \to 24,\ 767.356 \to 7,$
$784.85 \to 7,\ 785.532 \to 6,\ 815.893 \to 13,\ 817.867 \to 7,\ 827.775 \to 6\,|\,\rangle$

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

```
In[ ]:= table3 =
       N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
           _?(# == -9 &)]]], {1, 9, 10, 11, 12, 13}]];

In[ ]:= datafullnoNA[[table3[[Flatten@
           Position[RealDigits[table3[[All, 5]]][[All, 2]], _?(# == 5 &)], 1]], 11]] *= 10^4;
       datafullnoNA[[table3[[Complement[Range@Length@table3, Flatten@
           Position[RealDigits[table3[[All, 5]]][[All, 2]], _?(# == 5 &)]], 1]], 12]] /= 10^5;
       datafullnoNA[[table3[[Complement[Range@Length@table3, Flatten@
           Position[RealDigits[table3[[All, 5]]][[All, 2]], _?(# == 5 &)]], 1]], 11]] /= 10;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
        widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
        weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
        lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
        densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
            weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
        densities = densities /. Indeterminate → 0;
        KeySort@Counts@densities
```

⬚ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

⬚ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⬚ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

⬚ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⬚ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

⬚ **General**: Further output of Power::infy will be suppressed during this calculation.

⬚ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⬚ **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle|{-0.0003581 \to 6, 0 \to 39, 0. \to 7, 7.61481 \times 10^{-13} \to 6, 7.34619 \times 10^{-9} \to 7,}$
$7.35375 \times 10^{-9} \to 7, 7.46199 \times 10^{-9} \to 14, 7.47005 \times 10^{-9} \to 6, 7.48817 \times 10^{-9} \to 8,$
$7.50484 \times 10^{-9} \to 14, 7.51794 \times 10^{-9} \to 14, 7.52694 \times 10^{-9} \to 5, 7.54579 \times 10^{-9} \to 6,$
$7.55551 \times 10^{-9} \to 7,$ ⟨⋯ 16 245 ⋯⟩ $, 763.725 \to 6, 763.826 \to 16, 763.942 \to 7,$
$764.038 \to 7, 764.203 \to 7, 764.874 \to 7, 765.515 \to 7, 766.12 \to 24, 767.356 \to 7,$
$784.85 \to 7, 785.532 \to 6, 815.893 \to 13, 817.867 \to 7, 827.775 \to 6|\rangle$

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

```
In[ ]:= table4 =
        N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
            _? (# == -8 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table4[[Flatten@
            Position[RealDigits[table4[[All, 5]]][[All, 2]], _? (# == 4 &)], 1]], 11]] *= 10^3;
        datafullnoNA[[table4[[Complement[Range@Length@table4, Flatten@
            Position[RealDigits[table4[[All, 5]]][[All, 2]], _? (# == 4 &)]], 1]], 12]] /= 10^5;
        datafullnoNA[[table4[[Complement[Range@Length@table4, Flatten@
            Position[RealDigits[table4[[All, 5]]][[All, 2]], _? (# == 4 &)]], 1]], 11]] /= 10^2;
```

```
In[*]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
        widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
        weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
        lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
        densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
            weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
        densities = densities /. Indeterminate → 0;
        KeySort@Counts@densities
```

$\cdots$ Power: Infinite expression $\dfrac{1}{0.}$ encountered.

$\cdots$ Infinity: Indeterminate expression 0. ComplexInfinity encountered.

$\cdots$ Power: Infinite expression $\dfrac{1}{0.}$ encountered.

$\cdots$ Infinity: Indeterminate expression 0. ComplexInfinity encountered.

$\cdots$ Power: Infinite expression $\dfrac{1}{0.}$ encountered.

$\cdots$ General: Further output of Power::infy will be suppressed during this calculation.

$\cdots$ Infinity: Indeterminate expression 0. ComplexInfinity encountered.

$\cdots$ General: Further output of Infinity::indet will be suppressed during this calculation.

Out[*]= $\langle| -0.0003581 \to 6, 0 \to 39, 0. \to 7, 7.61481 \times 10^{-13} \to 6, 7.3302 \times 10^{-7} \to 5,$
$7.39785 \times 10^{-7} \to 5, 7.40713 \times 10^{-7} \to 4, 7.42905 \times 10^{-7} \to 4, 7.43071 \times 10^{-7} \to 4,$
$7.43187 \times 10^{-7} \to 4, 7.43362 \times 10^{-7} \to 4, 7.43452 \times 10^{-7} \to 5, 7.43898 \times 10^{-7} \to 8,$
$7.44067 \times 10^{-7} \to 7,$ $\boxed{\cdots 16\,220 \cdots}, 763.725 \to 6, 763.826 \to 16, 763.942 \to 7,$
$764.038 \to 7, 764.203 \to 7, 764.874 \to 7, 765.515 \to 7, 766.12 \to 24, 767.356 \to 7,$
$784.85 \to 7, 785.532 \to 6, 815.893 \to 13, 817.867 \to 7, 827.775 \to 6 |\rangle$

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

```
In[*]:= RealDigits@3.91`*^9
```

Out[*]= {{3, 9, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}, 10}

```
In[*]:= table5 =
        N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
            _?(# == -6 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table5[[Flatten@
          Position[RealDigits[table5[[All, 5]]][[All, 2]], _? (# == 5 &)], 1]], 11]] *= 10;
     datafullnoNA[[table5[[Flatten@Position[RealDigits[table5[[All, 5]]][[All, 2]],
          _? (# == 6 &)], 1]], 12]] /= 10;
     datafullnoNA[[table5[[Flatten@Position[RealDigits[table5[[All, 5]]][[All, 2]],
          _? (# == 1 &)], 1]], 11]] *= 10^4;
     datafullnoNA[[table5[[Flatten@Position[RealDigits[table5[[All, 5]]][[All, 2]],
          _? (# == 1 &)], 1]], 12]] *= 10^3;
     datafullnoNA[[table5[[Flatten@Position[RealDigits[table5[[All, 5]]][[All, 2]],
          _? (# == 10 &)], 1]], 11]] /= 10^4;
     datafullnoNA[[table5[[Flatten@Position[RealDigits[table5[[All, 5]]][[All, 2]],
          _? (# == 10 &)], 1]], 12]] /= 10^5;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
     widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
     weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
     lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
     densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
         weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
     densities = densities /. Indeterminate → 0;
     KeySort@Counts@densities
```

⋯ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

⋯ **General**: Further output of Power::infy will be suppressed during this calculation.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
⟨| $-0.0003581 \to 6$, $0 \to 39$, $0. \to 7$, $7.61481 \times 10^{-13} \to 6$, $6.78278 \times 10^{-6} \to 10$,
$6.85114 \times 10^{-6} \to 8$, $6.87191 \times 10^{-6} \to 3$, $6.88634 \times 10^{-6} \to 8$, $6.91767 \times 10^{-6} \to 7$,
$6.92681 \times 10^{-6} \to 7$, $6.93044 \times 10^{-6} \to 7$, $6.94229 \times 10^{-6} \to 8$, $6.95279 \times 10^{-6} \to 8$,
$6.98525 \times 10^{-6} \to 7$, ⋯ 16 120 ⋯ , $763.725 \to 6$, $763.826 \to 16$, $763.942 \to 7$,
$764.038 \to 7$, $764.203 \to 7$, $764.874 \to 7$, $765.515 \to 7$, $766.12 \to 24$, $767.356 \to 7$,
$784.85 \to 7$, $785.532 \to 6$, $815.893 \to 13$, $817.867 \to 7$, $827.775 \to 6$ |⟩

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

```
In[ ]:= table6 =
       N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
           _?(# == -12 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table6[[Flatten@
         Position[RealDigits[table6[[All, 5]]][[All, 2]], _?(# == 4 &)], 1]], 11]] *= 10^7;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
     widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
     weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
     lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
     densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
         weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
     densities = densities /. Indeterminate → 0;
     KeySort@Counts@densities
```

···) Power: Infinite expression $\frac{1}{0.}$ encountered.

···) Infinity: Indeterminate expression 0. ComplexInfinity encountered.

···) Power: Infinite expression $\frac{1}{0.}$ encountered.

···) Infinity: Indeterminate expression 0. ComplexInfinity encountered.

···) Power: Infinite expression $\frac{1}{0.}$ encountered.

···) General: Further output of Power::infy will be suppressed during this calculation.

···) Infinity: Indeterminate expression 0. ComplexInfinity encountered.

···) General: Further output of Infinity::indet will be suppressed during this calculation.

```
Out[ ]= ⟨| -0.0003581 → 6, 0 → 39, 0. → 7, 6.78278 × 10^-6 → 10, 6.85114 × 10^-6 → 8,
     6.87191 × 10^-6 → 3, 6.88634 × 10^-6 → 8, 6.91767 × 10^-6 → 7, 6.92681 × 10^-6 → 7,
     6.93044 × 10^-6 → 7, 6.94229 × 10^-6 → 8, 6.95279 × 10^-6 → 8, 6.98525 × 10^-6 → 7,
     6.9917 × 10^-6 → 9,  ··· 16 119 ··· , 763.725 → 6, 763.826 → 16, 763.942 → 7,
     764.038 → 7, 764.203 → 7, 764.874 → 7, 765.515 → 7, 766.12 → 24, 767.356 → 7,
     784.85 → 7, 785.532 → 6, 815.893 → 13, 817.867 → 7, 827.775 → 6 |⟩
```

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

```
In[ ]:= table7 = N@datafullnoNA[[
       Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]], _?(# == 3 &)]]],
       {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table7[[Flatten@
          Position[RealDigits[table7[[All, 4]]][[All, 2]], _?(# == 5 &)], 1]], 12]] *= 10^8;
      datafullnoNA[[table7[[Flatten@Position[RealDigits[table7[[All, 4]]][[All, 2]],
          _?(# == 4 &)], 1]], 12]] *= 10^8;
      datafullnoNA[[table7[[Flatten@Position[RealDigits[table7[[All, 4]]][[All, 2]],
          _?(# == 10 &)], 1]], 11]] /= 10^5;
      datafullnoNA[[table7[[Flatten@Position[RealDigits[table7[[All, 4]]][[All, 2]],
          _?(# == 10 &)], 1]], 12]] *= 10^3;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
      widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
      weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
      lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
      densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
          weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
      densities = densities /. Indeterminate → 0;
      KeySort@Counts@densities
```

... **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

... **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

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... **General**: Further output of Power::infy will be suppressed during this calculation.

... **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

... **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle | -0.0003581 \to 6, 0 \to 39, 0. \to 7, 6.78278 \times 10^{-6} \to 10, 6.85114 \times 10^{-6} \to 8,$
$6.87191 \times 10^{-6} \to 3, 6.88634 \times 10^{-6} \to 8, 6.91767 \times 10^{-6} \to 7, 6.92681 \times 10^{-6} \to 7,$
$6.93044 \times 10^{-6} \to 7, 6.94229 \times 10^{-6} \to 8, 6.95279 \times 10^{-6} \to 8, 6.98525 \times 10^{-6} \to 7,$
$6.9917 \times 10^{-6} \to 9,$ (⋯ 16 039 ⋯)$, 0.76043 \to 6, 0.761083 \to 7, 0.761389 \to 5,$
$0.761861 \to 16, 0.762056 \to 6, 0.762454 \to 7, 0.762842 \to 12, 0.763504 \to 5, 0.76365 \to 7,$
$0.763834 \to 12, 0.764051 \to 9, 0.765272 \to 7, 0.766903 \to 7, 9.28829 \to 24 | \rangle$

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

```
In[ ]:= table8 = N@datafullnoNA[[
          Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]], _?(# == 0 &)]]],
          {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table8[[Flatten@
          Position[RealDigits[table8[[All, 4]]][[All, 2]], _?(# == 5 &)], 1]], 12]] *= 10^5;
    datafullnoNA[[table8[[Flatten@Position[RealDigits[table8[[All, 4]]][[All, 2]],
          _?(# == 10 &)], 1]], 11]] /= 10^5;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
    widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
    weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
    lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
    densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
        weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
    densities = densities /. Indeterminate → 0;
    KeySort@Counts@densities
```

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **General**: Further output of Power::infy will be suppressed during this calculation.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle| -0.0003581 \to 6, 0 \to 39, 0. \to 7, 6.78278 \times 10^{-6} \to 10, 6.85114 \times 10^{-6} \to 8,$
$6.87191 \times 10^{-6} \to 3, 6.88634 \times 10^{-6} \to 8, 6.91767 \times 10^{-6} \to 7, 6.92681 \times 10^{-6} \to 7,$
$6.93044 \times 10^{-6} \to 7, 6.94229 \times 10^{-6} \to 8, 6.95279 \times 10^{-6} \to 8, 6.98525 \times 10^{-6} \to 7,$
$6.9917 \times 10^{-6} \to 9,$ ⋯ 16 019 ⋯ , $0.0784704 \to 8, 0.0785401 \to 4, 0.0785505 \to 8,$
$0.0794567 \to 7, 0.079572 \to 6, 0.0799779 \to 7, 0.081693 \to 8, 0.0817012 \to 6,$
$0.0823354 \to 7, 0.0825568 \to 7, 0.0825856 \to 7, 0.0837549 \to 7, 9.28829 \to 24 |\rangle$

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

```
In[ ]:= RealDigits@0.07854014074393222`
```

```
Out[ ]= {{7, 8, 5, 4, 0, 1, 4, 0, 7, 4, 3, 9, 3, 2, 2, 2}, -1}
```

```
In[ ]:= table9 =
    N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
        _?(# == -1 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[
    table9[[Flatten@Position[RealDigits[table9[[All, 4]]][[All, 2]], _?(# == 5 &)], 1]],
    12]] *= 10^4;
  datafullnoNA[[table9[[Flatten@
    Position[RealDigits[table9[[All, 4]]][[All, 2]], _?(# == 4 &)], 1]], 12]] *= 10^4;
  datafullnoNA[[table9[[Flatten@Position[RealDigits[table9[[All, 4]]][[All, 2]],
    _?(# == 1 &)], 1]], 11]] *= 10^4;
  datafullnoNA[[table9[[Flatten@Position[RealDigits[table9[[All, 4]]][[All, 2]],
    _?(# == 1 &)], 1]], 12]] *= 10^8;
  datafullnoNA[[table9[[Flatten@Position[RealDigits[table9[[All, 4]]][[All, 2]],
    _?(# == 10 &)], 1]], 11]] /= 10^5;
  datafullnoNA[[table9[[Flatten@Position[RealDigits[table9[[All, 4]]][[All, 2]],
    _?(# == 10 &)], 1]], 12]] /= 10^1;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
  widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
  weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
  lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
  densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
    weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
  densities = densities /. Indeterminate → 0;
  KeySort@Counts@densities
```

$\cdots$ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

$\cdots$ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

$\cdots$ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

$\cdots$ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

$\cdots$ **Power**: Infinite expression $\dfrac{1}{0.}$ encountered.

$\cdots$ **General**: Further output of Power::infy will be suppressed during this calculation.

$\cdots$ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

$\cdots$ **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle | -0.0003581 \to 6, 0 \to 39, 0. \to 7, 1.03544 \times 10^{-6} \to 5, 3.3906 \times 10^{-6} \to 7,$
$6.78278 \times 10^{-6} \to 10, 6.85114 \times 10^{-6} \to 8, 6.87191 \times 10^{-6} \to 3, 6.88634 \times 10^{-6} \to 8,$
$6.91767 \times 10^{-6} \to 7, 6.92681 \times 10^{-6} \to 7, 6.93044 \times 10^{-6} \to 7, 6.94229 \times 10^{-6} \to 8,$
$\boxed{\cdots 15\,027 \cdots}, 0.0000781852 \to 8, 0.000078394 \to 8, 0.0000824377 \to 5,$
$0.000192284 \to 7, 0.00115906 \to 7, 0.00134858 \to 7, 0.00747228 \to 5, 0.00754268 \to 4,$
$0.00755948 \to 4, 0.00756265 \to 5, 0.00758101 \to 6, 0.076598 \to 3, 9.28829 \to 24 | \rangle$

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

```
In[ ]:= table10 =
     N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
         _?(# == -2 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table10[[Flatten@
         Position[RealDigits[table10[[All, 4]]][[All, 2]], _?(# == 4 &)], 1]], 12]] *= 10^3;
     datafullnoNA[[table10[[Flatten@Position[RealDigits[table10[[All, 4]]][[All, 2]],
         _?(# == 3 &)], 1]], 11]] *= 10^1;
     datafullnoNA[[table10[[Flatten@Position[RealDigits[table10[[All, 4]]][[All, 2]],
         _?(# == 3 &)], 1]], 12]] *= 10^4;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
     widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
     weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
     lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
     densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
         weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
     densities = densities /. Indeterminate → 0;
     KeySort@Counts@densities
```

··· Power: Infinite expression $\dfrac{1}{0.}$ encountered.

··· Infinity: Indeterminate expression 0. ComplexInfinity encountered.

··· Power: Infinite expression $\dfrac{1}{0.}$ encountered.

··· Infinity: Indeterminate expression 0. ComplexInfinity encountered.

··· Power: Infinite expression $\dfrac{1}{0.}$ encountered.

··· General: Further output of Power::infy will be suppressed during this calculation.

··· Infinity: Indeterminate expression 0. ComplexInfinity encountered.

··· General: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle| -0.0003581 \to 6,\ 0 \to 39,\ 0. \to 7,\ 1.03544 \times 10^{-6} \to 5,\ 1.15906 \times 10^{-6} \to 7,\ 1.34858 \times 10^{-6} \to 7,$
$3.3906 \times 10^{-6} \to 7,\ 6.78278 \times 10^{-6} \to 10,\ 6.85114 \times 10^{-6} \to 8,\ 6.87191 \times 10^{-6} \to 3,$
$6.88634 \times 10^{-6} \to 8,\ 6.91767 \times 10^{-6} \to 7,\ 6.92681 \times 10^{-6} \to 7,$ ⟨ ··· 15 024 ··· ⟩,
$0.0000766171 \to 7,\ 0.0000766196 \to 8,\ 0.0000766271 \to 21,\ 0.0000767256 \to 7,$
$0.0000767277 \to 7,\ 0.0000767737 \to 6,\ 0.0000780236 \to 4,\ 0.0000781852 \to 8,$
$0.000078394 \to 8,\ 0.0000824377 \to 5,\ 0.000192284 \to 7,\ 0.076598 \to 3,\ 9.28829 \to 24 |\rangle$

large output | **show less** | **show more** | **show all** | **set size limit…**

```
In[ ]:= table11 =
     N@datafullnoNA[[Flatten@thickpos[[Flatten@Position[RealDigits[densities][[All, 2]],
         _?(# == -4 &)]]], {1, 9, 10, 11, 12, 13}]];
```

```
In[ ]:= datafullnoNA[[table11[[Flatten@
          Position[RealDigits[table11[[All, 4]]][[All, 2]], _?(# == 5 &)], 1]], 12]] *= 10^1;
      datafullnoNA[[table11[[Flatten@Position[RealDigits[table11[[All, 4]]][[All, 2]],
          _?(# == 1 &)], 1]], 11]] *= 10^3;
      datafullnoNA[[table11[[Flatten@Position[RealDigits[table11[[All, 4]]][[All, 2]],
          _?(# == 1 &)], 1]], 12]] *= 10^4;
      datafullnoNA[[table11[[Flatten@Position[RealDigits[table11[[All, 4]]][[All, 2]],
          _?(# == 10 &)], 1]], 11]] /= 10^6;
      datafullnoNA[[table11[[Flatten@Position[RealDigits[table11[[All, 4]]][[All, 2]],
          _?(# == 10 &)], 1]], 12]] /= 10^5;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
      widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
      weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
      lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
      densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
          weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
      densities = densities /. Indeterminate → 0;
      KeySort@Counts@densities
```

> ⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

> ⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

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> ⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

> ⋯ **General**: Further output of Power::infy will be suppressed during this calculation.

> ⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

> ⋯ **General**: Further output of Infinity::indet will be suppressed during this calculation.

```
Out[ ]= ⟨| -0.0003581 → 6, 0 → 39, 0. → 7, 1.03544 × 10^-6 → 5, 1.15906 × 10^-6 → 7, 1.34858 × 10^-6 → 7,
      3.3906 × 10^-6 → 7, 6.78278 × 10^-6 → 10, 6.85114 × 10^-6 → 8, 6.87191 × 10^-6 → 3,
      6.87581 × 10^-6 → 6, 6.88634 × 10^-6 → 8, 6.91767 × 10^-6 → 7,  ⋯ 14 486 ⋯ ,
      8.46265 × 10^-6 → 7, 8.46572 × 10^-6 → 7, 8.47446 × 10^-6 → 7, 8.4763 × 10^-6 → 7,
      8.48076 × 10^-6 → 7, 8.51343 × 10^-6 → 7, 8.51626 × 10^-6 → 7, 8.60324 × 10^-6 → 7,
      8.60358 × 10^-6 → 7, 0.0000755073 → 7, 0.000192284 → 7, 0.076598 → 3, 9.28829 → 24 |⟩
```

large output   **show less**   **show more**   **show all**   **set size limit…**

```
In[ ]:= datafullnoNA[[Flatten@
            thickpos[[Flatten@Position[densities, 0.00007550731477111845`]]], 11]] /= 10^1;
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[densities, 0.07659796061714341`]]],
            11]] /= 10^5;
        datafullnoNA[[Flatten@thickpos[[Flatten@Position[densities, 0.07659796061714341`]]],
            12]] /= 10^1;
```

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[Flatten@thickpos, 10]];
        widthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 9]];
        weightvaluesthkpos = datafullnoNA[[Flatten@thickpos, 11]];
        lengthvaluesthkpos = datafullnoNA[[Flatten@thickpos, 12]];
        densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
            weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
        densities = densities /. Indeterminate → 0;
        KeySort@Counts@densities
```

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **Power**: Infinite expression $\frac{1}{0.}$ encountered.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

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⋯ **General**: Further output of Power::infy will be suppressed during this calculation.

⋯ **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

⋯ **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]=
$\langle| -0.0003581 \to 6,\ 0 \to 39,\ 0. \to 7,\ 1.03544 \times 10^{-6} \to 5,\ 1.15906 \times 10^{-6} \to 7,\ 1.34858 \times 10^{-6} \to 7,$
$3.3906 \times 10^{-6} \to 7,\ 6.78278 \times 10^{-6} \to 10,\ 6.85114 \times 10^{-6} \to 8,\ 6.87191 \times 10^{-6} \to 3,$
$6.87581 \times 10^{-6} \to 6,\ 6.88634 \times 10^{-6} \to 8,\ 6.91767 \times 10^{-6} \to 7,\ \boxed{\cdots\ 14\,485\ \cdots},$
$8.45417 \times 10^{-6} \to 7,\ 8.4573 \times 10^{-6} \to 5,\ 8.46265 \times 10^{-6} \to 7,\ 8.46572 \times 10^{-6} \to 7,$
$8.47446 \times 10^{-6} \to 7,\ 8.4763 \times 10^{-6} \to 7,\ 8.48076 \times 10^{-6} \to 7,\ 8.51343 \times 10^{-6} \to 7,$
$8.51626 \times 10^{-6} \to 7,\ 8.60324 \times 10^{-6} \to 7,\ 8.60358 \times 10^{-6} \to 7,\ 0.000192284 \to 7,\ 9.28829 \to 24 |\rangle$

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

```
In[ ]:= Length@densities
        Length@densities[[Flatten@Position[RealDigits[densities][[All, 2]], _?(# == -5 &)]]]
```

Out[ ]= 396 299

Out[ ]= 396 216

In[ ]:= `KeySort@`
` Counts@densities[[Flatten@Position[RealDigits[densities][[All, 2]], _?(# == -5 &)]]]`

Out[ ]=
$\langle |\, 1.03544 \times 10^{-6} \to 5,\ 1.15906 \times 10^{-6} \to 7,\ 1.34858 \times 10^{-6} \to 7,$
$3.3906 \times 10^{-6} \to 7,\ 6.78278 \times 10^{-6} \to 10,\ 6.85114 \times 10^{-6} \to 8,\ 6.87191 \times 10^{-6} \to 3,$
$6.87581 \times 10^{-6} \to 6,\ 6.88634 \times 10^{-6} \to 8,\ 6.91767 \times 10^{-6} \to 7,\ 6.92681 \times 10^{-6} \to 7,$
$6.93044 \times 10^{-6} \to 7,\ 6.94229 \times 10^{-6} \to 8,$ ⋯ 14 481 ⋯ $,\ 8.43639 \times 10^{-6} \to 7,$
$8.45417 \times 10^{-6} \to 7,\ 8.4573 \times 10^{-6} \to 5,\ 8.46265 \times 10^{-6} \to 7,\ 8.46572 \times 10^{-6} \to 7,$
$8.47446 \times 10^{-6} \to 7,\ 8.4763 \times 10^{-6} \to 7,\ 8.48076 \times 10^{-6} \to 7,\ 8.51343 \times 10^{-6} \to 7,$
$8.51626 \times 10^{-6} \to 7,\ 8.60324 \times 10^{-6} \to 7,\ 8.60358 \times 10^{-6} \to 7\, |\rangle$

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

suitable densities belong to rows that will be considered in the dataset

In[ ]:= `Length@Position[densities[[`
` Flatten@Position[RealDigits[densities][[All, 2]], _?(# == -5 &)]]], _?(# > 6*^-6 &)]`

Out[ ]= 396 190

In[ ]:= `datafullnoNA[[`
`    Flatten@thickpos[[Complement[Range@Length@densities, Flatten@Position[densities[[`
`        Flatten@Position[RealDigits[densities][[All, 2]], _?(# == -5 &)]], _?`
`        (# > 6*^-6 &)]]]], 11]] = "NA";`
` datafullnoNA[[Flatten@thickpos[[Complement[Range@Length@densities,`
`     Flatten@Position[densities[[Flatten@Position[RealDigits[densities][[All, 2]],`
`        _?(# == -5 &)]], _?(# > 6*^-6 &)]]]], 12]] = "NA";`
` datafullnoNA[[Flatten@thickpos[[Complement[Range@Length@densities,`
`     Flatten@Position[densities[[Flatten@Position[RealDigits[densities][[All, 2]],`
`        _?(# == -5 &)]], _?(# > 6*^-6 &)]]]], 10]] = "NA";`
` datafullnoNA[[Flatten@thickpos[[Complement[Range@Length@densities,`
`     Flatten@Position[densities[[Flatten@Position[RealDigits[densities][[All, 2]],`
`        _?(# == -5 &)]], _?(# > 6*^-6 &)]]]], 9]] = "NA";`
` datafullnoNA = datafullnoNA /. "NA" → 0.;`

In[ ]:= `datafullnoNA[[Complement[Range@Length@datafullnoNA, Flatten@`
`     Position[RealDigits[datafullnoNA[[All, 10]]][[All, 2]], _?(# ≤ 2 &)]], 11]] = "NA";`
` datafullnoNA[[Complement[Range@Length@datafullnoNA, Flatten@`
`     Position[RealDigits[datafullnoNA[[All, 10]]][[All, 2]], _?(# ≤ 2 &)]], 12]] = "NA";`
` datafullnoNA[[Complement[Range@Length@datafullnoNA, Flatten@`
`     Position[RealDigits[datafullnoNA[[All, 10]]][[All, 2]], _?(# ≤ 2 &)]], 9]] = "NA";`
` datafullnoNA[[Complement[Range@Length@datafullnoNA, Flatten@`
`     Position[RealDigits[datafullnoNA[[All, 10]]][[All, 2]], _?(# ≤ 2 &)]], 10]] = "NA";`
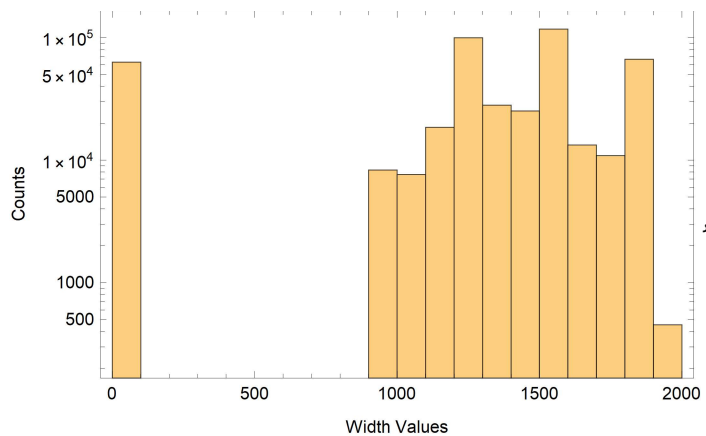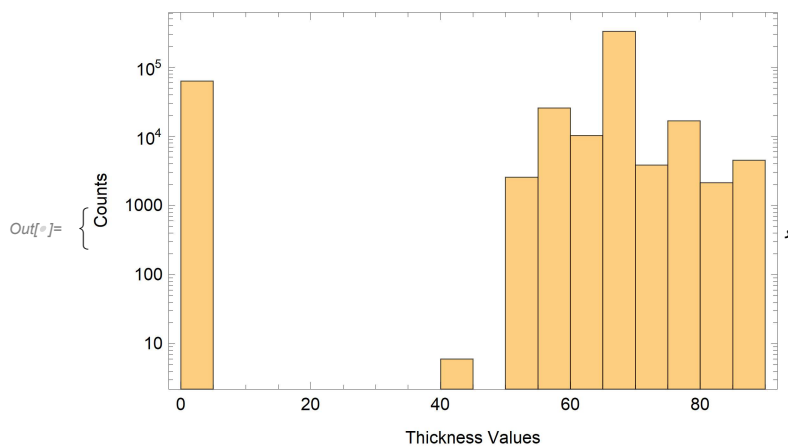` datafullnoNA = datafullnoNA /. "NA" → 0.;`

```
In[ ]:= datafullnoNA[[Flatten@Position[datafullnoNA[[All, 9]], _? (# > 10^9 &)], 12]] = "NA";
       datafullnoNA[[Flatten@Position[datafullnoNA[[All, 9]], _? (# > 10^9 &)], 11]] = "NA";
       datafullnoNA[[Flatten@Position[datafullnoNA[[All, 9]], _? (# > 10^9 &)], 10]] = "NA";
       datafullnoNA[[Flatten@Position[datafullnoNA[[All, 9]], _? (# > 10^9 &)], 9]] = "NA";
       datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= {Histogram[datafullnoNA[[All, 10]], ScalingFunctions → "Log", PlotRange → Full,
        Frame → True, FrameLabel → {"Thickness Values", "Counts"}, ImageSize → Medium],
       Histogram[datafullnoNA[[All, 9]], ScalingFunctions → "Log", PlotRange → Full,
        Frame → True, FrameLabel → {"Width Values", "Counts"}, ImageSize → Medium],
       Histogram[datafullnoNA[[All, 12]], ScalingFunctions → "Log", PlotRange → Full,
        Frame → True, FrameLabel → {"Length Values", "Counts"}, ImageSize → Medium],
       Histogram[datafullnoNA[[All, 11]], ScalingFunctions → "Log", PlotRange → Full,
        Frame → True, FrameLabel → {"Weight Values", "Counts"}, ImageSize → Medium]}
       (*,Histogram[datafullnoNA[[All,12]],ScalingFunctions→"Log",PlotRange→{{0,10^7},All},
        Frame→True,FrameLabel→{"Length Values","Counts"},ImageSize→Medium],
       Histogram[datafullnoNA[[All,11]],ScalingFunctions→"Log",PlotRange→{{-100,10^7},All},
        Frame→True,FrameLabel→{"Weight Values","Counts"},ImageSize→Medium]*)
```
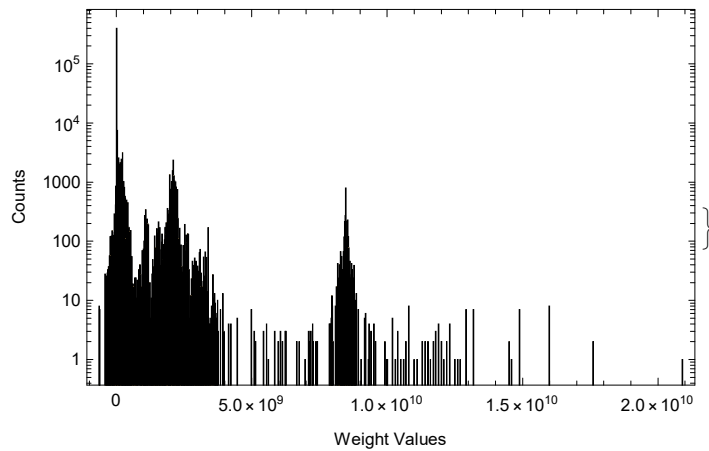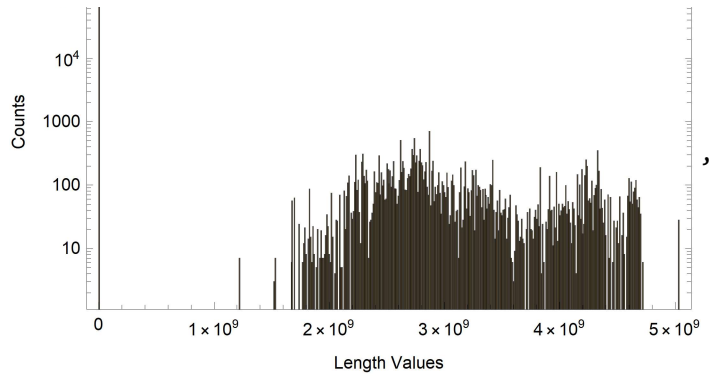
```
In[ ]:= Length@Position[datafullnoNA[[All, 10]], 0]
       Length@Position[datafullnoNA[[All, 11]], 0]

Out[ ]= 61 327

Out[ ]= 10 491

In[ ]:= weightpos = Complement[Range@Length@datafullnoNA, Flatten@
           Join[Position[datafullnoNA[[All, 10]], 0], Position[datafullnoNA[[All, 10]], 0.]]];

In[ ]:= KeySort@Counts[N@datafullnoNA[[weightpos, 11]]];

In[ ]:= datafullnoNA[[
         Flatten@weightpos[[Flatten@Position[RealDigits[datafullnoNA[[weightpos, 11]]][[
             All, 2]], _? (# == 10 &)]]], 12]] /= 10^6;
       datafullnoNA[[Flatten@weightpos[[Flatten@Position[RealDigits[
              datafullnoNA[[weightpos, 11]]][[All, 2]], _? (# == 10 &)]]], 11]] /= 10^6;

In[ ]:= datafullnoNA[[
         Flatten@weightpos[[Flatten@Position[RealDigits[datafullnoNA[[weightpos, 11]]][[
             All, 2]], _? (# == 9 &)]]], 12]] /= 10^5;
       datafullnoNA[[Flatten@weightpos[[Flatten@Position[
             RealDigits[datafullnoNA[[weightpos, 11]]][[All, 2]], _? (# == 9 &)]]], 11]] /= 10^5;
```

```
In[◦]:= datafullnoNA[[
        Flatten@weightpos[[Flatten@Position[RealDigits[datafullnoNA[[weightpos, 11]]][[
            All, 2]], _? (# == 8 &)]]], 12]] /= 10^4;
      datafullnoNA[[Flatten@weightpos[[Flatten@Position[
            RealDigits[datafullnoNA[[weightpos, 11]]][[All, 2]], _? (# == 8 &)]]], 11]] /= 10^4;
```

```
In[◦]:= datafullnoNA[[
        weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]], 2.6`*^7]]], 9]] = "NA";
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]], 2.6`*^7]]],
        10]] = "NA";
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]], 2.6`*^7]]],
        12]] = "NA";
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]], 2.6`*^7]]],
        11]] = "NA";
      datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[◦]:= datafullnoNA[[weightpos[[Flatten@Position[
            RealDigits[datafullnoNA[[weightpos, 11]]][[All, 2]], _? (# == 6 &)]]], 12]] /= 10;
      datafullnoNA[[weightpos[[Flatten@Position[RealDigits[datafullnoNA[[weightpos, 11]]][[
            All, 2]], _? (# == 6 &)]]], 11]] /= 10;
```

```
In[◦]:= datafullnoNA[[weightpos[[
        Flatten@Position[datafullnoNA[[weightpos, 11]], _? (# ≥ 26 700 &)]]], 12]] /= 10;
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
            _? (# ≥ 26 700 &)]]], 11]] /= 10;
```

```
In[◦]:= datafullnoNA[[weightpos[[
        Flatten@Position[datafullnoNA[[weightpos, 11]], _? (400 ≤ # < 2670 &)]]], 12]] *= 10;
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
            _? (400 ≤ # < 2670 &)]]], 11]] *= 10;
```

```
In[◦]:= datafullnoNA[[weightpos[[
        Flatten@Position[datafullnoNA[[weightpos, 11]], _? (3 < # < 4 &)]]], 12]] *= 1000;
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
            _? (3 < # < 4 &)]]], 11]] *= 1000;
```
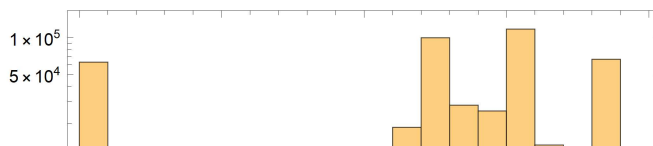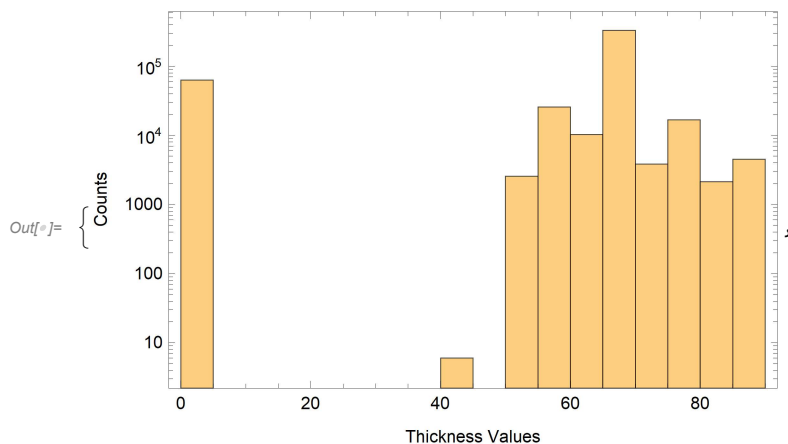
```
In[◦]:= datafullnoNA[[weightpos[[
        Flatten@Position[datafullnoNA[[weightpos, 11]], _? (1 < # < 3 &)]]], 12]] *= 10 000;
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
            _? (1 < # < 3 &)]]], 11]] *= 10 000;
```

```
In[◦]:= datafullnoNA[[
        weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]], _? (0.01 < # < 1 &)]]],
        12]] *= 1 000 000;
      datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
            _? (0.01 < # < 1 &)]]], 11]] *= 1 000 000;
```

```
In[ ]:= datafullnoNA[[weightpos[[Flatten@
          Position[datafullnoNA[[weightpos, 11]], _?(10^(-4) < # < 0.01 &)]]], 12]] *= 10^8;
     datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
          _?(10^(-4) < # < 0.01 &)]]], 11]] *= 10^8;
```

```
In[ ]:= datafullnoNA[[weightpos[[Flatten@Position[
          datafullnoNA[[weightpos, 11]], _?(10^(-5) < # < 10^(-4) &)]]], 12]] *= 10^9;
     datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]],
          _?(10^(-5) < # < 10^(-4) &)]]], 11]] *= 10^9;
```

```
In[ ]:= datafullnoNA[[weightpos[[
          Flatten@Position[datafullnoNA[[weightpos, 11]], _?Negative]]], 12]] *= 10^7;
     datafullnoNA[[weightpos[[Flatten@Position[datafullnoNA[[weightpos, 11]], _?Negative]]],
        11]] *= -10^7;
```

```
In[ ]:= datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], _?(# > 80000 &)], 9]] = "NA";
     datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], _?(# > 80000 &)], 10]] = "NA";
     datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], _?(# > 80000 &)], 11]] = "NA";
     datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], _?(# > 80000 &)], 12]] = "NA";
     datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= KeySort@Counts[N@datafullnoNA[[weightpos, 11]]];
```

```
In[ ]:= {Histogram[datafullnoNA[[All, 10]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Thickness Values", "Counts"}, ImageSize → Medium],
      Histogram[datafullnoNA[[All, 9]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Width Values", "Counts"}, ImageSize → Medium],
      Histogram[datafullnoNA[[All, 12]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Length Values", "Counts"}, ImageSize → Medium],
      Histogram[datafullnoNA[[All, 11]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Weight Values", "Counts"}, ImageSize → Medium]}
```

Out[ ]=

,

In[ ]:= **Length@Position[datafullnoNA[[All, 10]], 0]**
Length@Position[datafullnoNA[[All, 11]], 0]

Out[ ]= 61 327

Out[ ]= 10 491

```
In[ ]:= weightposonzerosofothers = Intersection[Flatten@Position[datafullnoNA[[All, 10]], 0],
         Complement[Range@Length@datafullnoNA[[All, 11]], Flatten@Join[
            Position[datafullnoNA[[All, 11]], 0], Position[datafullnoNA[[All, 11]], 0.]]]];
      Length@weightposonzerosofothers
```

```
Out[ ]= 50 843
```

```
In[ ]:= RealDigits@-9.47`*^7
```

```
Out[ ]= {{9, 4, 7, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}, 8}
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
         Flatten@Position[RealDigits[datafullnoNA[[weightposonzerosofothers, 11]]][[All, 2]],
           _?(# == 11 &)]]], 11]] /= 10^6;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
         Flatten@Position[RealDigits[datafullnoNA[[weightposonzerosofothers, 11]]][[All, 2]],
           _?(# == 10 &)]]], 11]] /= 10^6;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
         Flatten@Position[RealDigits[datafullnoNA[[weightposonzerosofothers, 11]]][[All, 2]],
           _?(# == 9 &)]]], 11]] /= 10^5;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(5.3`*^6 ≤ # &)]]], 11]] /= 10^3;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(500 000 == # &)]]], 11]] /= 10^2;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(29 000 ≤ # &)]]], 11]] /= 10;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(1000 < # < 2700 &)]]], 11]] *= 10;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(30.5 ≤ # ≤ 145 &)]]], 11]] *= 100;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(3 ≤ # ≤ 25 &)]]], 11]] *= 10^3;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
         datafullnoNA[[weightposonzerosofothers, 11]], _?(0.5 ≤ # ≤ 2.5 &)]]], 11]] *= 10^4;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
         Flatten@Position[datafullnoNA[[weightposonzerosofothers, 11]],
           _?(-10 * 10^7 < # ≤ -2.9 * 10^7 &)]]], 11]] /= -10^4;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
         Flatten@Position[datafullnoNA[[weightposonzerosofothers, 11]],
           _?(-2.6 * 10^7 ≤ # ≤ -4.7 * 10^6 &)]]], 11]] /= -10^3;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
          Flatten@Position[datafullnoNA[[weightposonzerosofothers, 11]],
            _? (-6350 ≤ # ≤ -2700 &)]]], 11]] *= -1;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
          Flatten@Position[datafullnoNA[[weightposonzerosofothers, 11]],
            _? (-2650 ≤ # ≤ -1050 &)]]], 11]] *= -10;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
            datafullnoNA[[weightposonzerosofothers, 11]], _? (-4 ≤ # ≤ -3 &)]]], 11]] *= -10^3;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[
          Flatten@Position[datafullnoNA[[weightposonzerosofothers, 11]],
            _? (-2.5 ≤ # ≤ -0.5 &)]]], 11]] *= -10^4;
```

```
In[ ]:= datafullnoNA[[weightposonzerosofothers[[Flatten@Position[
            datafullnoNA[[weightposonzerosofothers, 11]], _? (# == -0.147 &)]]], 11]] *= -10^5;
```

```
In[ ]:= KeySort@Counts@datafullnoNA[[weightposonzerosofothers, 11]];
```

```
In[ ]:= datafullnoNA[[Flatten@Position[datafullnoNA[[All, 11]], _? (# > 150 000 &)], 9]] = "NA";
    datafullnoNA[[Flatten@Position[datafullnoNA[[All, 11]], _? (# > 150 000 &)], 10]] = "NA";
    datafullnoNA[[Flatten@Position[datafullnoNA[[All, 11]], _? (# > 150 000 &)], 12]] = "NA";
    datafullnoNA[[Flatten@Position[datafullnoNA[[All, 11]], _? (# > 150 000 &)], 11]] = "NA";
    datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], 9/200], 9]] = "NA";

    datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], 9/200], 10]] = "NA";

    datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], 9/200], 11]] = "NA";

    datafullnoNA[[Flatten@Position[datafullnoNA[[All, 12]], 9/200], 12]] = "NA";

    datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= datafullnoNA[[{390 449, 390 450, 390 451, 390 452, 390 453, 390 454, 390 455}, 11]] = 21 200.;
    datafullnoNA[[{390 449, 390 450, 390 451, 390 452, 390 453, 390 454, 390 455}, 12]] = 42 200.;
```

```
In[ ]:= {Histogram[datafullnoNA[[All, 10]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Thickness Values", "Counts"}, ImageSize → Medium],
      Histogram[datafullnoNA[[All, 9]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Width Values", "Counts"}, ImageSize → Medium],
      Histogram[datafullnoNA[[All, 12]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Length Values", "Counts"}, ImageSize → Medium],
      Histogram[datafullnoNA[[All, 11]], ScalingFunctions → "Log", PlotRange → Full,
       Frame → True, FrameLabel → {"Weight Values", "Counts"}, ImageSize → Medium]}
```

Out[○]=

Weight Values
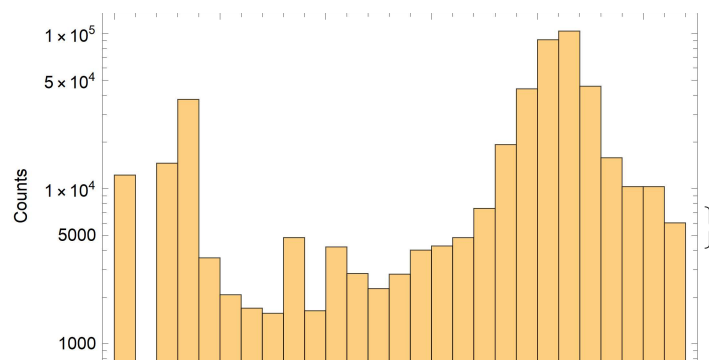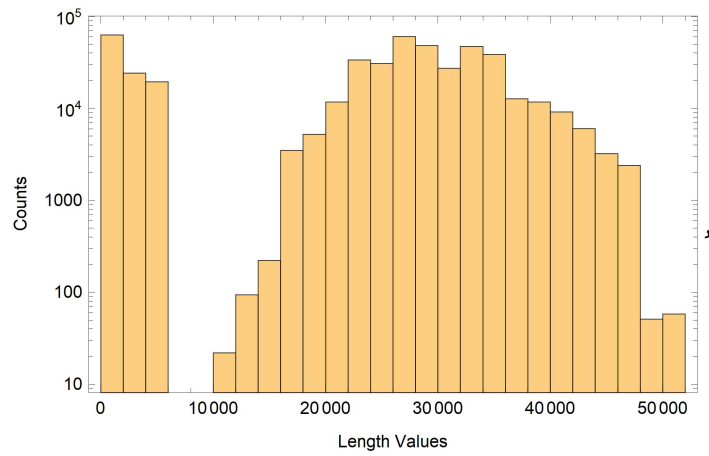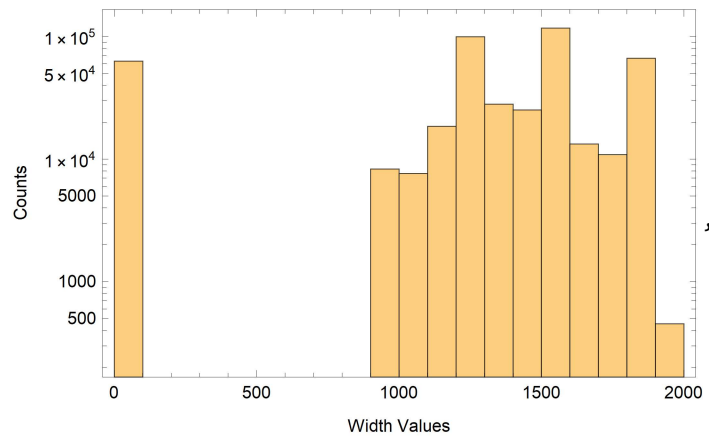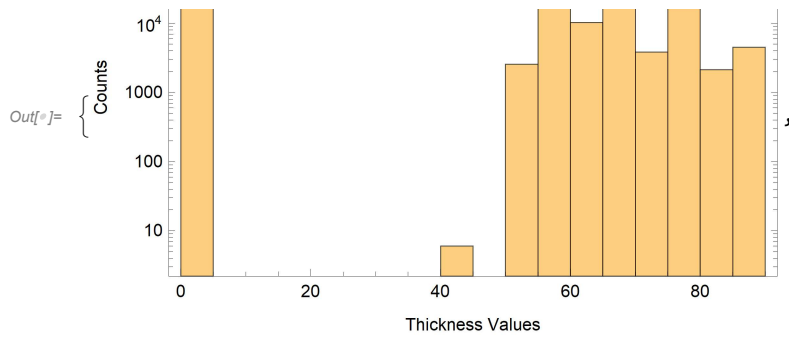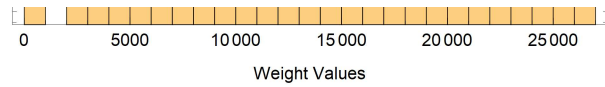
```
In[ ]:= datafullnoNA[[63 ;; 69, 9]] = 1220.;
       datafullnoNA[[63 ;; 69, 10]] = 65;
       datafullnoNA[[63 ;; 69, 12]] = 6530. / 19 700. * 32 600.;
```

```
In[ ]:= Length@Position[datafullnoNA[[All, 11]], 0]
       Length@Position[datafullnoNA[[All, 12]], 0]
       Length@Position[datafullnoNA[[All, 10]], 0]
       Length@Position[datafullnoNA[[All, 9]], 0]
```

Out[ ]= 10 484

Out[ ]= 61 320

Out[ ]= 61 320

Out[ ]= 61 320

```
In[ ]:= thickvaluesthkpos = datafullnoNA[[All, 10]];
       widthvaluesthkpos = datafullnoNA[[All, 9]];
       weightvaluesthkpos = datafullnoNA[[All, 11]];
       lengthvaluesthkpos = datafullnoNA[[All, 12]];
       densities = Table[density[thickvaluesthkpos[[i]], widthvaluesthkpos[[i]],
             weightvaluesthkpos[[i]], lengthvaluesthkpos[[i]]], {i, Length@thickvaluesthkpos}];
       densities = densities /. {Indeterminate → 0, ComplexInfinity → 0};
       KeySort@Counts@densities
```

… **Power**: Infinite expression $\dfrac{1}{0}$ encountered.

… **Power**: Infinite expression $\dfrac{1}{0}$ encountered.

… **Power**: Infinite expression $\dfrac{1}{0}$ encountered.

… **General**: Further output of Power::infy will be suppressed during this calculation.

… **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

… **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

… **Infinity**: Indeterminate expression 0. ComplexInfinity encountered.

… **General**: Further output of Infinity::indet will be suppressed during this calculation.

Out[ ]= $\langle|\, 0 \rightarrow 63\,079,\ 1.15906 \times 10^{-6} \rightarrow 7,\ 1.34858 \times 10^{-6} \rightarrow 7,\ 3.3906 \times 10^{-6} \rightarrow 7,\ 6.78278 \times 10^{-6} \rightarrow 10,$
$6.85114 \times 10^{-6} \rightarrow 8,\ 6.87191 \times 10^{-6} \rightarrow 3,\ 6.87581 \times 10^{-6} \rightarrow 6,\ 6.88634 \times 10^{-6} \rightarrow 8,$
$6.91767 \times 10^{-6} \rightarrow 7,\ 6.92681 \times 10^{-6} \rightarrow 7,\ 6.93044 \times 10^{-6} \rightarrow 7,\ 6.94229 \times 10^{-6} \rightarrow 8,$
[… 14 470 …], $8.45417 \times 10^{-6} \rightarrow 7,\ 8.4573 \times 10^{-6} \rightarrow 5,\ 8.46265 \times 10^{-6} \rightarrow 7,\ 8.46572 \times 10^{-6} \rightarrow 7,$
$8.47446 \times 10^{-6} \rightarrow 7,\ 8.4763 \times 10^{-6} \rightarrow 7,\ 8.48076 \times 10^{-6} \rightarrow 7,\ 8.51343 \times 10^{-6} \rightarrow 7,$
$8.51626 \times 10^{-6} \rightarrow 7,\ 8.60324 \times 10^{-6} \rightarrow 7,\ 8.60358 \times 10^{-6} \rightarrow 7,\ 0.000192284 \rightarrow 7 \,|\rangle$

large output   **show less**   **show more**   **show all**   **set size limit...**
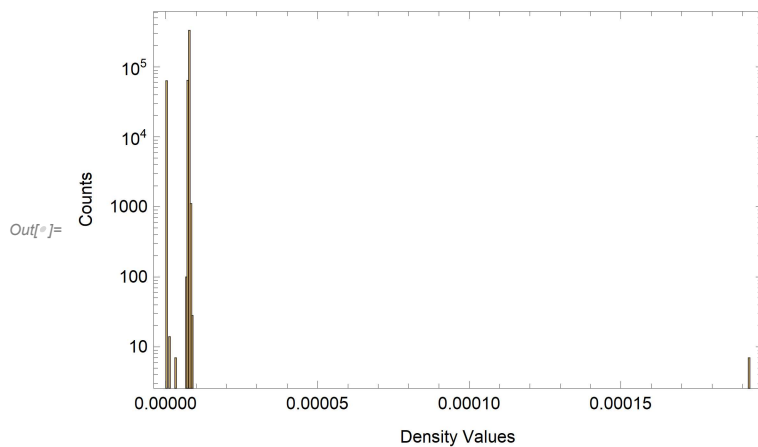
```
In[ ]:= datafullnoNA[[Flatten@Position[densities, 0.00019228365685058598`], 9]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 0.00019228365685058598`], 10]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 0.00019228365685058598`], 11]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 0.00019228365685058598`], 12]] = "NA";
       datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= datafullnoNA[[Flatten@Position[densities, 1.1590604621295158`*^-6], 9]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 1.1590604621295158`*^-6], 10]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 1.1590604621295158`*^-6], 11]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 1.1590604621295158`*^-6], 12]] = "NA";
       datafullnoNA = datafullnoNA /. "NA" → 0.;
```
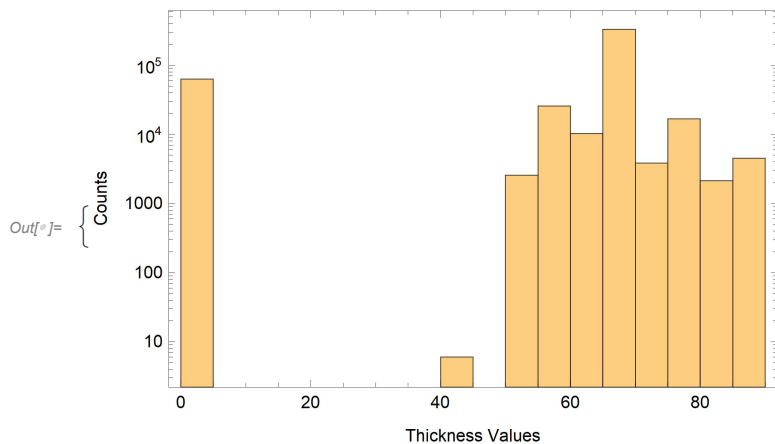
```
In[ ]:= datafullnoNA[[Flatten@Position[densities, 1.3485812924803107`*^-6], 9]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 1.3485812924803107`*^-6], 10]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 1.3485812924803107`*^-6], 11]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 1.3485812924803107`*^-6], 12]] = "NA";
       datafullnoNA = datafullnoNA /. "NA" → 0.;
```

```
In[ ]:= datafullnoNA[[Flatten@Position[densities, 3.3905958651080047`*^-6], 9]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 3.3905958651080047`*^-6], 10]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 3.3905958651080047`*^-6], 11]] = "NA";
       datafullnoNA[[Flatten@Position[densities, 3.3905958651080047`*^-6], 12]] = "NA";
       datafullnoNA = datafullnoNA /. "NA" → 0.;
```
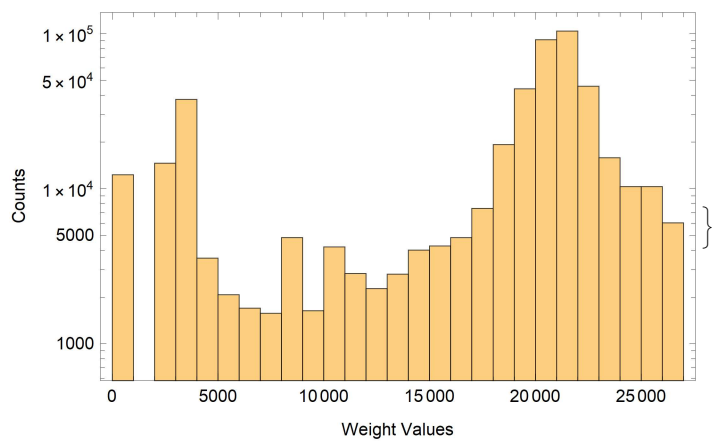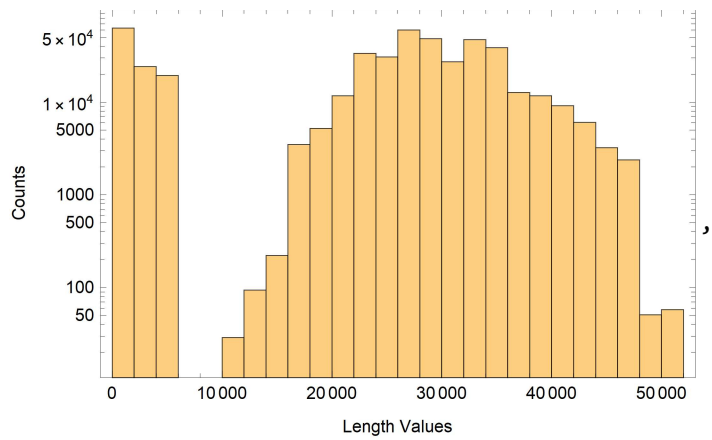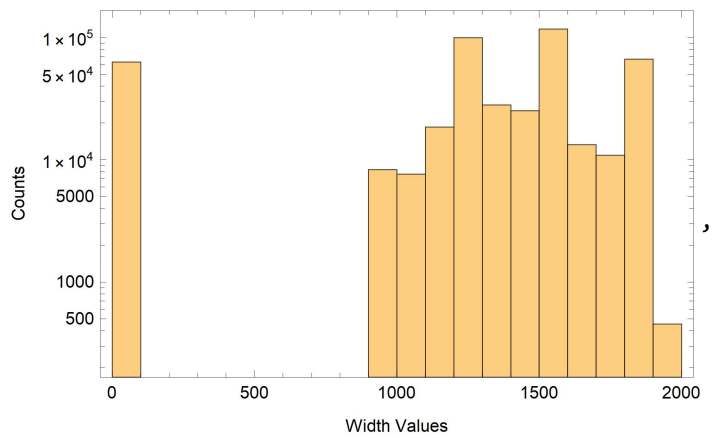
```
In[ ]:= Histogram[densities, ScalingFunctions → "Log", PlotRange → Full,
        Frame → True, FrameLabel → {"Density Values", "Counts"}, ImageSize → Medium]
```

Out[ ]=


```
In[ ]:= {Histogram[datafullnoNA[[All, 10]], ScalingFunctions → "Log", PlotRange → Full,
         Frame → True, FrameLabel → {"Thickness Values", "Counts"}, ImageSize → Medium],
        Histogram[datafullnoNA[[All, 9]], ScalingFunctions → "Log", PlotRange → Full,
         Frame → True, FrameLabel → {"Width Values", "Counts"}, ImageSize → Medium],
        Histogram[datafullnoNA[[All, 12]], ScalingFunctions → "Log", PlotRange → Full,
         Frame → True, FrameLabel → {"Length Values", "Counts"}, ImageSize → Medium],
        Histogram[datafullnoNA[[All, 11]], ScalingFunctions → "Log", PlotRange → Full,
         Frame → True, FrameLabel → {"Weight Values", "Counts"}, ImageSize → Medium]}
```

Out[ ]=

```
In[ ]:= convertionpos = Flatten@Position[datafullnoNA[[All, 12]], _ ? (0 < # < 10 000 &)];

In[ ]:= Position[datafullnoNA[[convertionpos, 11]], _ ? (2669 < # < 4600 &)];

In[ ]:= KeySort@Counts@datafullnoNA[[convertionpos, 12]];

In[ ]:= KeySort@Counts@datafullnoNA[[convertionpos, 11]];
```

```
In[ ]:= datafullnoNA = datafullnoNA /. 0. → "NA";

    (* Export["ccm_manipulated.csv",datafullnoNA] *)

In[ ]:= Length@datafullnoNA - (Length@Position[datafullnoNA[[All, 9]], "NA"] +
        Length@Position[datafullnoNA[[All, 9]], 0])

Out[ ]= 396 096

In[ ]:= datafullnoNA396096 = datafullnoNA[[Complement[Range@Length@datafullnoNA, Flatten@Join[
            Position[datafullnoNA[[All, 9]], "NA"], Position[datafullnoNA[[All, 9]], 0]]]]];

    (* Export["ccm_manipulated_396096.csv",datafullnoNA396096] *)

In[ ]:= manipulator[data_, seq_] := Module[{initialdata, filtercon, part,
        pos, newwidth, newthick, firstlength, firstweight, newlength, newstgr},
      initialdata = data;
      filtercon = Select[initialdata, #[[13]] == seq &];
      part = Join[filtercon[[All, 1 ;; 2]], filtercon[[All, 9 ;; 14]], 2];
      pos = Split[Select[Flatten@
          Take[Sort@If[MemberQ[part[[All, 3]], 0], Position[part[[All, 3]], 0], {}], All],
         part[[#, 5]] != 0 &], #2 - #1 == 1 &];
      newwidth = Table[part[[pos[[i]][[1]] - 1, 3]], {i, Length@pos}];
      newthick = Table[part[[pos[[i]][[1]] - 1, 4]], {i, Length@pos}];
      firstlength = Table[part[[pos[[i]][[1]] - 1, 6]], {i, Length@pos}];
      firstweight = Table[part[[pos[[i]][[1]] - 1, 5]], {i, Length@pos}];
      newlength = Table[
        N@part[[pos[[i]][[1]], 5]] * firstlength[[i]] / firstweight[[i]], {i, Length@pos}];
      newstgr = Table[part[[pos[[i]][[1]] - 1, 8]], {i, Length@pos}];
      Table[initialdata[[part[[pos[[i]], 1]], 9]] = newwidth[[i]], {i, Length@pos}];
      Table[initialdata[[part[[pos[[i]], 1]], 10]] = newthick[[i]], {i, Length@pos}];
      Table[initialdata[[part[[pos[[i]], 1]], 12]] = newlength[[i]], {i, Length@pos}];
      Table[initialdata[[part[[pos[[i]], 1]], 14]] = newstgr[[i]], {i, Length@pos}];
      initialdata]

In[ ]:= datafullmodified = Import["../data/ccm_manipulated.csv", HeaderLines → 1];

In[ ]:= list = DeleteDuplicates@datafullmodified[[All, 13]];

In[ ]:= listo = Partition[list, Length@list / 3];

In[ ]:= a = listo[[1, 1 ;; 20]];

In[ ]:= a

Out[ ]= {16 000 181, 17 000 341, 17 000 281, 17 000 761, 17 001 141, 17 001 201,
    17 001 221, 16 000 201, 17 000 401, 17 000 381, 17 000 421, 17 000 441, 17 000 021,
    17 000 261, 16 001 121, 16 001 141, 16 001 201, 16 001 181, 16 000 761, 16 000 781}
```

In[ ]:= `Position[datafullmodified[[All, 10]], 0]`

Out[ ]=
```
{{45}, {46}, {47}, {48}, {98}, {99}, {100}, {101}, {102}, {103}, {104},
 {105}, {149}, {150}, {151}, {152}, {153}, {154}, {199}, {200}, {201}, {202},
 {203}, {204}, {205}, {206}, {207}, {208}, {209}, {210}, {262}, {263}, {264},
 {265}, {266}, {267}, {268}, {276}, {277}, {278}, {279}, {280}, ⟨ ⋯ 61 236 ⋯ ⟩,
 {458 853}, {458 854}, {458 855}, {458 943}, {458 944}, {458 945}, {458 946},
 {458 947}, {458 948}, {458 949}, {458 975}, {458 976}, {458 977}, {458 978},
 {458 979}, {458 980}, {459 077}, {459 078}, {459 079}, {459 080}, {459 081},
 {459 082}, {459 083}, {459 084}, {459 113}, {459 114}, {459 115}, {459 116},
 {459 117}, {459 118}, {459 154}, {459 155}, {459 156}, {459 157}, {459 158},
 {459 159}, {459 176}, {459 177}, {459 178}, {459 179}, {459 202}, {459 203}}
```

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

In[ ]:= `Fold[manipulator[datafullmodified, 16 000 181], a]`

Out[ ]=
```
{{1, 122, 115 686, CCM1, 14.12.16, 16000181-04,
   148 956, ♯NAME?, 1240, 87, 2740, 3350, 16 000 181, 26, 0, 0},
  {2, 122, 115 686, CCM1, 14.12.16, 16000181-06, 148 958, ♯NAME?, 1240, 87,
   2740, 3350, 16 000 181, 26, 0, 0}, {3, 122, 115 686, CCM1, 14.12.16,
   16000181-07, 148 959, ♯NAME?, 1240, 87, 2740, 3350, 16 000 181, 26, 0, 0},
  {4, 122, 115 686, CCM1, 14.12.16, 16000181-05, 148 957, ♯NAME?, 1240, 87,
   2740, 3350, 16 000 181, 26, 0, 0}, ⟨ ⋯ 459 196 ⋯ ⟩, {459 201, 4154, 893 030, CCM1,
   14.02.18, 18024141-02, 352 650, ♯NAME?, NA, NA, NA, NA, 18 024 141, 41, 0, 5},
  {459 202, 154, 120 368, CCM1, 03.01.17, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {459 203, 154, 120 377, CCM1, 03.01.17, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}}[
  ⟨ ⋯ 1 ⋯ ⟩, ⟨ ⋯ 8 ⋯ ⟩]
```

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

`%8[[41, 42, 43, 44, 45, 46, 47, 48, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106},`
`  {1, 9, 10, 11, 12}]]`

⟨⋯⟩ Part: Part {41, 42, 43, 44, 45, 46, 47, 48, 95, 96, ≪10≫} of ≪4471373880 bytes≫ does not exist.

Out[ ]= `$Aborted[ ]`

In[ ]:= **Flatten[%8, 20]**

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    148 956, ♯NAME?, 1240, 87, 2740, 3350, 16 000 181, 26, 0, 0},
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    16000181-01, 000000-1, ♯NAME?, 1240, 87, 2740, 3350, 16 000 181, 26, 0, 0},
  {6, 122, 115 686, CCM1, 14.12.16, 16000181-02, 148 954, ♯NAME?, 1240, 87,
    2740, 3350, 16 000 181, 26, 0, 0}, {7, 122, 115 686, CCM1, 14.12.16,
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    14.02.18, 18024141-03, 352 651, ♯NAME?, NA, NA, NA, NA, 18 024 141, 41, 0, 5},
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  {459 202, 154, 120 368, CCM1, 03.01.17, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0},
  {459 203, 154, 120 377, CCM1, 03.01.17, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}}[
  16 000 181, 17 000 341, 17 000 281, (⋯ 14 ⋯), 16 001 181, 16 000 761, 16 000 781]

large output   **show less**   **show more**   **show all**   **set size limit…**