```
(* 7. Linearna Regresija
 Primoz Jeras *)
```

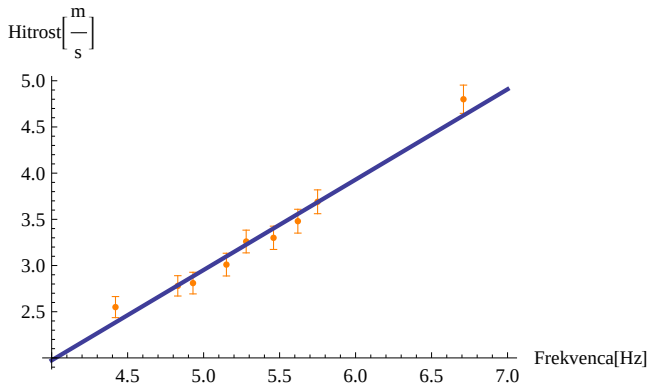
In[38]:=
```
Needs["ErrorBarPlots`"]
```

In[772]:=
```
adrenalin = ReadList["Documents\FMF\ROvF\Tema7\Adrenalin.dat", {Real, Real}];
tintin = ReadList["Documents\FMF\ROvF\Tema7\Tintin.dat", {Real, Real, Real}];
interval = ReadList["Documents\FMF\ROvF\Tema7\Interval.dat", Real];
htof =
  ReadList["Documents\FMF\ROvF\Tema7\HitrostTokaOdFrekvence.txt", {Real, Real, Real}];
```

```
(*1. HitrostTokaOdFrekvence.txt*)
```

In[668]:=
```
htoffit =
  LinearModelFit[{#[[1]], #[[2]]} & /@ htof, x, x, Weights → Map[1 / (#[[3]])^2 &, htof]];
Show[ErrorListPlot[htof, PlotStyle → Orange], Plot[htoffit[x], {x, 4, 7}, PlotStyle → Thick],
 AxesLabel → {"Frekvenca"["Hz"], "Hitrost"["m" / "s"]}]
n = htoffit[0];
k = htoffit[1] - n;
χ = Sqrt[Sum[(htof[[i, 2]] - k htof[[i, 1]] - n)^2, {i, Count[htof, _]}]];
Normal[htoffit]
χ^2
```

Out[669]=



Out[673]=
```
-1.93864 + 0.978093 x
```

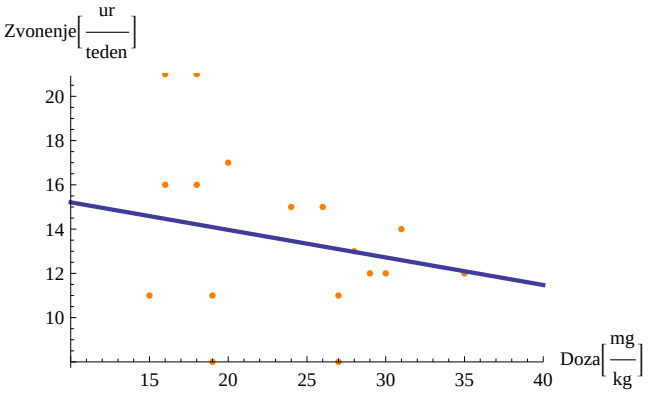
Out[674]=
```
0.0891523
```

```
(*Podatki z napako (oranzno) in premica z najboljsim prilagajanjem (modro),
s parametroma n=-1.94 in k=0.98, χ^2=0.09.*)
```

```
(*2. Tintin.dat*)
```

In[337]:=
```
tintinfit = LinearModelFit[{#[[2]], #[[3]]} & /@ tintin, x, x];
Show[ListPlot[{#[[2]], #[[3]]} & /@ tintin, PlotStyle → Orange],
 Plot[tintinfit[x], {x, 10, 40}, PlotStyle → Thick],
 AxesLabel → {"Doza"["mg" / "kg"], "Zvonenje"["ur" / "teden"]},
 PlotRange → {{10, 40}, Automatic}]
```

Out[338]=




```
(*3. Interval.dat*)
```

In[754]:=
```
bcount = BinCounts[interval, 100];
bbin = Array[100 # &, Count[bcount, _]];
bhist = Table[{bbin[[i]], bcount[[i]]}, {i, 18}];
intlinfit = LinearModelFit[{#[[1]], Log[#[[2]]]} & /@ bhist // N, x, x];
λ = 1 / Mean[interval];
k = -λ
k = intlinfit[1] - intlinfit[0]
A = Exp[intlinfit[0]]
λ = -k;
```

Out[759]= -0.00321456

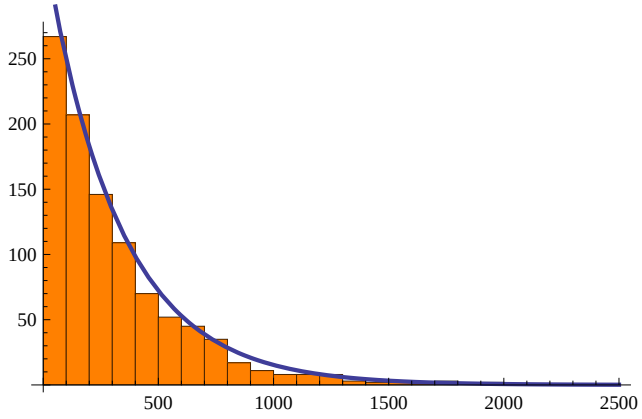
Out[760]= -0.00310224

Out[761]= 340.569

```
(*λ kot negativen naklon premice, ki se prilega y=Log[w] od x,
je v priblizku enak reciprocni povprecni vrednosti histograma,
torej lahko izracunamo A, ki je 340.*)
```

In[815]:=
```
Show[Histogram[interval, ChartStyle → Orange],
 Plot[A Exp[-λ x], {x, -200, 2500}, PlotStyle → Thick],
 AxesLabel → {"", ""}, PlotRange → {{0, 2500}, {0, 250}}]
```

Out[815]=




```
(*4. Adrenalin.dat*)
```

In[785]:=
```
adrlinfit = LinearModelFit[{1 / #[[2]], 1 / #[[1]]} & /@ adrenalin // N, x, x];
a = 1 / htoffit[0]
Fmax = (htoffit[1] - n) / a
```

Out[786]= −0.515825

Out[787]= 13.1656

```
(*Odvisnost po kemijski kinetiki lahko linearno zapisemo kot y=1/a - x Fmax/a,
kjer je y=1/c, x=1/F in poiscemo parametra tej funkciji n=1/a, k=Fmax/a*)
```