Szakdolgozat - Farkas Lajos

Statisztika: Griechisch Erika

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Hipotézisek

1. Hüvelyi szülés után a medencefenék izmai megnyúlnak a császármetszéshez képest.
2. Az újszülött súlya szignifikáns összefüggést mutat a medencefenék izmainak megnyúlásával. A nagyobb születési súllyal megnő a medencefenék izmainak megnyúlása.
3. A szülések számával arányosan nő a medencefenék izmainak megnyúlása.
4. Az anyai BMI-vel arányosan nő a medencefenék izmainak megnyúlása.
5. A terhességi korral arányosan növekszig a medencefenék izmainak megnyúlása (mondjuk az első trimeszterbeli értékeket kellene összevetni a szülés előttivel).
6. A szülés előtti medencefenék (36. hetes UH) megnyúlása nagyobb a szülés utáni 6 hetes kontrollhoz képest.
7. Fiatalabb várandósoknál kisebb mértékú az izmok megnyúlása, mint az idősebbeknél
8. Fiatal várandósoknál nagyobb a szülés előtt és a szülés után mért izomnyúlás közötti különbség, mint az idősebb várandósoknál. (jobb a regenerációs hajlam fiatalabb korban)
9. Az izommegnyúlás mértéke korrelál a testmagassággal.
10. Szülés módja alapján a dL_9-dL_8 értékek nőnek hüvelyi szülés esetén

„Megnyúlnak” = delták. Abszolút érték számít. TODO

Magyarázat

Mag	Anyai magasság (cm)
Gr	Terhességek száma
Pa	Hüvelyi szülések száma
Cae	Császármetszések száma
Sz_mod	Szülés módja: PVN=hüvelyi, SC=császár
Sz_het	Szüléskor betöltött terhességi hetek száma
Sz_suly	Újszülött tömege
Tkor_	Terhességi kor napban kifejezve *-dik méréskor
CRL_	Ülőméret *-dik méréskor
BPD_	Biparietalis distance *-dik megjelenéskor
L1_; H1_...	Méretek nyugalomban (mm)
L2_; H2_...	Méretek hasprésre (mm)
Ttkg_	Anyai testtömeg -dik méréskor (kg)
dL_; dH_*	L1_ - L2_; H1_ - H2_...
Suly_	Magzat becsült tömege *-dik megjelenéskor

```
d = read.csv("~/Work/Education/Statisztikai_elemzesek/FarkasLajos_noi_klinika/STAT_DB.csv")
attach(d)
summary(d)
```

```
##      BetegID      TAJ               BMI              Ek
##  Beteg001:  1   Mode:logical   Min.   :16.50   Min.   :21.00
##  Beteg002:  1   NA's:218       1st Qu.:21.50   1st Qu.:30.00
##  Beteg003:  1                  Median :23.55   Median :33.00
##  Beteg004:  1                  Mean   :24.60   Mean   :32.72
##  Beteg005:  1                  3rd Qu.:27.00   3rd Qu.:36.00
##  Beteg006:  1                  Max.   :54.30   Max.   :43.00
##  (Other) :212                  NA's   :4
##       MagM            Mag              Gr             Pa
##  Min.   :1.470   Min.   :147.0   Min.   :1.00   Min.   :0.0000
##  1st Qu.:1.630   1st Qu.:163.0   1st Qu.:1.00   1st Qu.:0.0000
##  Median :1.665   Median :166.5   Median :2.00   Median :1.0000
##  Mean   :1.667   Mean   :166.7   Mean   :2.02   Mean   :0.9085
##  3rd Qu.:1.700   3rd Qu.:170.0   3rd Qu.:3.00   3rd Qu.:1.0000
##  Max.   :1.840   Max.   :184.0   Max.   :6.00   Max.   :4.0000
##  NA's   :4       NA's   :4       NA's   :65     NA's   :65
##       Cae          Sz_mod        Sz_het          Sz_suly          Tkor_1
##  Min.   :0.0000      :  3   Min.   :32.00   Min.   :1900          :144
##  1st Qu.:0.0000   PVN:108   1st Qu.:39.00   1st Qu.:3140   45     :  6
##  Median :0.0000   SC :107   Median :39.00   Median :3455   48     :  5
##  Mean   :0.7386             Mean   :39.11   Mean   :3441   51     :  4
##  3rd Qu.:1.0000             3rd Qu.:40.00   3rd Qu.:3700   6+4    :  4
##  Max.   :3.0000             Max.   :41.00   Max.   :4500   40     :  3
##  NA's   :65                 NA's   :5       NA's   :6      (Other): 52
##      CRL_1             L1_1            H1_1             B1_1
##  Min.   : 1.000   Min.   :18.00   Min.   : 2.300   Min.   : 9.80
##  1st Qu.: 6.225   1st Qu.:23.80   1st Qu.: 8.125   1st Qu.:20.40
##  Median :10.150   Median :26.35   Median :11.350   Median :23.40
##  Mean   :12.934   Mean   :26.55   Mean   :11.749   Mean   :23.81
##  3rd Qu.:18.200   3rd Qu.:29.18   3rd Qu.:14.450   3rd Qu.:27.85
##  Max.   :40.100   Max.   :38.00   Max.   :30.500   Max.   :34.90
##  NA's   :60       NA's   :92      NA's   :92       NA's   :99
##       C1_1            L2_1            H2_1            B2_1
##  Min.   :12.90   Min.   : 0.00   Min.   : 3.70   Min.   :-6.50
##  1st Qu.:18.35   1st Qu.:20.30   1st Qu.:10.25   1st Qu.:11.20
##  Median :21.65   Median :24.35   Median :14.40   Median :18.10
##  Mean   :22.45   Mean   :24.22   Mean   :15.50   Mean   :17.09
##  3rd Qu.:25.73   3rd Qu.:28.70   3rd Qu.:19.07   3rd Qu.:23.40
##  Max.   :36.10   Max.   :39.40   Max.   :43.80   Max.   :31.10
##  NA's   :126     NA's   :92      NA's   :92      NA's   :99
##       C2_1           Ttkg_1           dL_1             dH_1
##  Min.   : 7.80   Min.   : 45.00   Min.   :-8.000   Min.   :-28.700
##  1st Qu.:17.12   1st Qu.: 57.75   1st Qu.:-0.475   1st Qu.: -5.350
##  Median :20.55   Median : 63.75   Median : 2.450   Median : -2.850
##  Mean   :21.06   Mean   : 65.68   Mean   : 2.329   Mean   : -3.749
##  3rd Qu.:24.48   3rd Qu.: 72.00   3rd Qu.: 4.375   3rd Qu.: -1.150
##  Max.   :64.90   Max.   :108.00   Max.   :25.900   Max.   : 15.600
##  NA's   :124     NA's   :150      NA's   :92       NA's   :92
##       dB_1             dC_1              Tkor_2        CRL_2
##  Min.   :-9.000   Min.   :-35.6000          :124   Min.   : 6.47
##  1st Qu.: 3.375   1st Qu.: -1.3000   12+4   :  7   1st Qu.:54.65
##  Median : 5.600   Median :  0.9000   86     :  5   Median :60.15
##  Mean   : 6.659   Mean   :  0.9106   11/5   :  4   Mean   :59.70
##  3rd Qu.:10.500   3rd Qu.:  4.1750   12/0   :  4   3rd Qu.:65.53
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##  Max.   :25.400   Max.   : 12.3000   12/1   :  4   Max.   :93.20
##  NA's   :98       NA's   :124        (Other): 70   NA's   :22
##       L1_2            H1_2            B1_2            C1_2
##  Min.   :14.50   Min.   :-4.60   Min.   : 5.90   Min.   : 1.8
##  1st Qu.:23.38   1st Qu.:10.05   1st Qu.:19.00   1st Qu.:16.2
##  Median :25.20   Median :12.50   Median :22.60   Median :20.0
##  Mean   :25.37   Mean   :13.50   Mean   :22.65   Mean   :19.4
##  3rd Qu.:27.60   3rd Qu.:15.55   3rd Qu.:25.90   3rd Qu.:23.9
##  Max.   :36.10   Max.   :76.60   Max.   :62.50   Max.   :35.3
##  NA's   :34      NA's   :35      NA's   :51      NA's   :93
##       L2_2            H2_2            B2_2            C2_2
##  Min.   :-4.60   Min.   : 3.40   Min.   :-7.90   Min.   : 7.70
##  1st Qu.:19.00   1st Qu.:12.80   1st Qu.:10.30   1st Qu.:15.50
##  Median :22.30   Median :17.10   Median :14.80   Median :19.30
##  Mean   :22.13   Mean   :18.38   Mean   :14.72   Mean   :19.64
##  3rd Qu.:25.65   3rd Qu.:23.80   3rd Qu.:19.60   3rd Qu.:22.60
##  Max.   :39.70   Max.   :53.90   Max.   :34.20   Max.   :32.60
##  NA's   :36      NA's   :35      NA's   :50      NA's   :93
##      Ttkg_2           dL_2            dH_2            dB_2
##  Min.   : 17.30   Min.   :-14.000   Min.   :-35.000   Min.   :-10.900
##  1st Qu.: 59.00   1st Qu.:  0.100   1st Qu.: -7.425   1st Qu.:  2.800
##  Median : 65.00   Median :  2.300   Median : -2.750   Median :  7.100
##  Mean   : 67.62   Mean   :  3.492   Mean   : -4.853   Mean   :  7.701
##  3rd Qu.: 74.00   3rd Qu.:  5.200   3rd Qu.: -0.800   3rd Qu.: 12.225
##  Max.   :132.00   Max.   : 31.600   Max.   : 51.000   Max.   : 46.300
##  NA's   :69       NA's   :33        NA's   :34        NA's   :48
##       dC_2             Tkor_3        Suly_3          BPD_3
##  Min.   :-24.5000          :154   Min.   :103.0   Min.   :27.30
##  1st Qu.: -1.7000   15/5   :  6   1st Qu.:141.0   1st Qu.:34.00
##  Median :  0.7000   112    :  5   Median :155.0   Median :35.72
##  Mean   : -0.2408   114    :  5   Mean   :160.5   Mean   :35.87
##  3rd Qu.:  3.8000   117    :  3   3rd Qu.:169.8   3rd Qu.:37.60
##  Max.   : 12.7000   118    :  3   Max.   :275.0   Max.   :49.70
##  NA's   :93         (Other): 42   NA's   :132     NA's   :8
##      FRO_3            HC_3            AC_3           FEM_3
##  Min.   :33.90   Min.   : 13.1   Min.   : 11.6   Min.   :13.60
##  1st Qu.:42.23   1st Qu.:121.6   1st Qu.:103.2   1st Qu.:19.12
##  Median :44.10   Median :127.5   Median :109.0   Median :20.30
##  Mean   :44.50   Mean   :127.6   Mean   :109.5   Mean   :20.72
##  3rd Qu.:46.29   3rd Qu.:133.8   3rd Qu.:115.8   3rd Qu.:22.07
##  Max.   :63.00   Max.   :178.5   Max.   :163.3   Max.   :34.40
##  NA's   :8       NA's   :8       NA's   :8       NA's   :8
##       L1_3            H1_3            B1_3            C1_3
##  Min.   :16.40   Min.   : 0.20   Min.   : 6.90   Min.   : 8.70
##  1st Qu.:22.90   1st Qu.: 9.40   1st Qu.:18.60   1st Qu.:17.75
##  Median :25.50   Median :12.30   Median :21.80   Median :21.50
##  Mean   :25.66   Mean   :13.08   Mean   :22.11   Mean   :21.74
##  3rd Qu.:28.40   3rd Qu.:15.60   3rd Qu.:25.50   3rd Qu.:25.10
##  Max.   :38.00   Max.   :45.00   Max.   :34.00   Max.   :42.40
##  NA's   :13      NA's   :13      NA's   :27      NA's   :63
##       L2_3            H2_3            B2_3            C2_3
##  Min.   : 1.60   Min.   : 6.30   Min.   :-10.60   Min.   : 8.80
##  1st Qu.:19.40   1st Qu.:12.80   1st Qu.:  9.20   1st Qu.:16.65
##  Median :23.00   Median :15.60   Median : 15.60   Median :19.70
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##  Mean   :22.81   Mean   :16.86   Mean   : 14.51   Mean   :20.23
##  3rd Qu.:27.00   3rd Qu.:19.60   3rd Qu.: 19.60   3rd Qu.:22.60
##  Max.   :34.70   Max.   :42.30   Max.   : 30.10   Max.   :42.10
##  NA's   :13      NA's   :13      NA's   :27       NA's   :63
##      Ttkg_3            dL_3             dH_3             dB_3
##  Min.   : 44.00   Min.   :-6.800   Min.   :-22.00   Min.   :-10.30
##  1st Qu.: 59.00   1st Qu.: 0.400   1st Qu.: -5.60   1st Qu.:  4.60
##  Median : 66.00   Median : 2.300   Median : -3.20   Median :  7.20
##  Mean   : 68.72   Mean   : 2.845   Mean   : -3.78   Mean   :  7.60
##  3rd Qu.: 74.50   3rd Qu.: 4.500   3rd Qu.: -1.60   3rd Qu.: 10.55
##  Max.   :145.00   Max.   :23.300   Max.   :  5.90   Max.   : 32.20
##  NA's   :39       NA's   :13       NA's   :13       NA's   :27
##       dC_3             Tkor_4        Suly_4          BPD_4
##  Min.   :-14.900          :153   Min.   :250.0   Min.   :20.17
##  1st Qu.: -0.350   140    :  4   1st Qu.:317.2   1st Qu.:46.20
##  Median :  1.400   144    :  3   Median :353.5   Median :48.57
##  Mean   :  1.511   149    :  3   Mean   :365.1   Mean   :48.39
##  3rd Qu.:  3.900   155    :  3   3rd Qu.:397.8   3rd Qu.:50.90
##  Max.   : 12.700   19/6   :  3   Max.   :539.0   Max.   :62.20
##  NA's   :63        (Other): 49   NA's   :128     NA's   :2
##      FRO_4            HC_4            AC_4           FEMU_4
##  Min.   :50.60   Min.   : 39.3   Min.   : 64.0   Min.   :23.90
##  1st Qu.:59.75   1st Qu.:169.6   1st Qu.:148.2   1st Qu.:31.38
##  Median :62.50   Median :177.1   Median :156.8   Median :33.10
##  Mean   :62.39   Mean   :176.9   Mean   :157.0   Mean   :33.39
##  3rd Qu.:64.80   3rd Qu.:184.3   3rd Qu.:164.9   3rd Qu.:35.17
##  Max.   :78.40   Max.   :219.6   Max.   :209.3   Max.   :46.60
##  NA's   :3       NA's   :2       NA's   :2       NA's   :2
##       L1_4             H1_4            B1_4            C1_4
##  Min.   : 15.50   Min.   : 3.20   Min.   : 2.50   Min.   :10.70
##  1st Qu.: 22.90   1st Qu.: 9.70   1st Qu.:17.80   1st Qu.:18.85
##  Median : 26.00   Median :12.60   Median :21.35   Median :21.20
##  Mean   : 26.58   Mean   :12.89   Mean   :21.20   Mean   :21.67
##  3rd Qu.: 28.20   3rd Qu.:15.50   3rd Qu.:25.18   3rd Qu.:23.50
##  Max.   :226.50   Max.   :26.50   Max.   :34.00   Max.   :40.70
##  NA's   :7        NA's   :7       NA's   :12      NA's   :49
##       L2_4             H2_4            B2_4            C2_4
##  Min.   :-6.20   Min.   : 3.50   Min.   :-11.60   Min.   :11.3
##  1st Qu.:18.80   1st Qu.:13.30   1st Qu.:  7.80   1st Qu.:17.8
##  Median :23.00   Median :15.80   Median : 13.10   Median :20.1
##  Mean   :22.57   Mean   :16.83   Mean   : 12.63   Mean   :20.5
##  3rd Qu.:26.50   3rd Qu.:19.80   3rd Qu.: 18.20   3rd Qu.:22.8
##  Max.   :38.90   Max.   :36.50   Max.   : 31.70   Max.   :30.5
##  NA's   :7       NA's   :7       NA's   :13       NA's   :49
##      Ttkg_4            dL_4             dH_4             dB_4
##  Min.   : 45.00   Min.   :-10.600   Min.   :-19.300   Min.   :-8.200
##  1st Qu.: 61.00   1st Qu.:  0.850   1st Qu.: -6.025   1st Qu.: 5.100
##  Median : 68.00   Median :  2.750   Median : -3.800   Median : 7.900
##  Mean   : 71.06   Mean   :  3.998   Mean   : -3.920   Mean   : 8.591
##  3rd Qu.: 78.00   3rd Qu.:  5.025   3rd Qu.: -1.500   3rd Qu.:11.000
##  Max.   :148.00   Max.   :203.200   Max.   : 10.100   Max.   :32.200
##  NA's   :21       NA's   :6         NA's   :6         NA's   :11
##       dC_4             Tkor_5        Suly_5          BPD_5
##  Min.   :-11.100          :153   Min.   : 516.0   Min.   :29.60
```

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##  1st Qu.: -1.000   176    :  4   1st Qu.: 641.5   1st Qu.:58.77
##  Median :  0.900   164    :  3   Median : 695.5   Median :61.50
##  Mean   :  1.166   170    :  3   Mean   : 722.5   Mean   :61.40
##  3rd Qu.:  2.675   171    :  3   3rd Qu.: 795.8   3rd Qu.:63.90
##  Max.   : 18.700   23/5   :  3   Max.   :1122.0   Max.   :74.53
##  NA's   :48        (Other): 49   NA's   :130      NA's   :2
##      FRO_5             HC_5           AC_5           FEMU_5
##  Min.   :  58.00   Min.   :115.2   Min.   : 22.3   Min.   :34.30
##  1st Qu.:  76.38   1st Qu.:215.9   1st Qu.:192.7   1st Qu.:42.50
##  Median :  79.05   Median :223.8   Median :201.2   Median :44.33
##  Mean   : 114.00   Mean   :223.3   Mean   :200.3   Mean   :44.62
##  3rd Qu.:  81.60   3rd Qu.:232.1   3rd Qu.:208.5   3rd Qu.:46.50
##  Max.   :7608.00   Max.   :267.2   Max.   :245.2   Max.   :54.60
##  NA's   :2         NA's   :2       NA's   :2       NA's   :2
##       L1_5            H1_5            B1_5            C1_5
##  Min.   :13.10   Min.   : 3.20   Min.   : 3.80   Min.   : 11.20
##  1st Qu.:22.70   1st Qu.:10.00   1st Qu.:17.68   1st Qu.: 17.70
##  Median :25.60   Median :12.50   Median :21.50   Median : 20.80
##  Mean   :25.94   Mean   :12.59   Mean   :21.48   Mean   : 21.61
##  3rd Qu.:28.60   3rd Qu.:15.20   3rd Qu.:25.43   3rd Qu.: 23.80
##  Max.   :39.60   Max.   :24.00   Max.   :37.90   Max.   :118.60
##  NA's   :13      NA's   :13      NA's   :14      NA's   :41
##       L2_5            H2_5            B2_5            C2_5
##  Min.   :-4.40   Min.   : 2.70   Min.   :-17.30   Min.   : 9.0
##  1st Qu.:18.40   1st Qu.:13.70   1st Qu.:  7.95   1st Qu.:17.7
##  Median :22.00   Median :16.80   Median : 13.10   Median :20.4
##  Mean   :22.22   Mean   :17.14   Mean   : 12.68   Mean   :20.8
##  3rd Qu.:25.80   3rd Qu.:19.80   3rd Qu.: 17.70   3rd Qu.:23.0
##  Max.   :44.20   Max.   :31.90   Max.   : 35.10   Max.   :35.3
##  NA's   :13      NA's   :13      NA's   :14       NA's   :41
##      Ttkg_5            dL_5             dH_5             dB_5
##  Min.   : 49.00   Min.   :-16.200   Min.   :-21.800   Min.   :-11.20
##  1st Qu.: 63.00   1st Qu.:  1.600   1st Qu.: -7.100   1st Qu.:  5.90
##  Median : 70.00   Median :  3.400   Median : -4.400   Median :  8.35
##  Mean   : 73.08   Mean   :  3.721   Mean   : -4.546   Mean   :  8.80
##  3rd Qu.: 80.00   3rd Qu.:  5.600   3rd Qu.: -2.300   3rd Qu.: 11.30
##  Max.   :150.00   Max.   : 31.200   Max.   : 10.500   Max.   : 35.80
##  NA's   :31       NA's   :13        NA's   :13        NA's   :14
##       dC_5              Tkor_6        Suly_6         BPD_6
##  Min.   : -9.8000          :153   Min.   : 920   Min.   :57.20
##  1st Qu.: -2.4250   192    :  3   1st Qu.:1212   1st Qu.:72.20
##  Median :  0.2500   194    :  3   Median :1326   Median :75.29
##  Mean   :  0.8296   200    :  3   Mean   :1365   Mean   :75.02
##  3rd Qu.:  2.8500   214    :  3   3rd Qu.:1473   3rd Qu.:77.90
##  Max.   :100.5000   27/6   :  3   Max.   :2532   Max.   :98.20
##  NA's   :42         (Other): 50   NA's   :130    NA's   :3
##      FRO_6             HC_6            AC_6           FEMU_6
##  Min.   : 78.00   Min.   : 26.4   Min.   : 32.5   Min.   : 41.60
##  1st Qu.: 92.30   1st Qu.:263.5   1st Qu.:236.8   1st Qu.: 53.00
##  Median : 94.50   Median :270.5   Median :247.2   Median : 55.00
##  Mean   : 94.55   Mean   :269.7   Mean   :246.7   Mean   : 56.03
##  3rd Qu.: 97.30   3rd Qu.:278.9   3rd Qu.:257.5   3rd Qu.: 56.78
##  Max.   :108.20   Max.   :311.0   Max.   :323.4   Max.   :263.10
##  NA's   :3        NA's   :3       NA's   :3       NA's   :3
```

```
##       L1_6            H1_6            B1_6           C1_6
##  Min.   :15.00   Min.   : 3.70   Min.   : 9.2   Min.   :10.20
##  1st Qu.:23.23   1st Qu.:10.10   1st Qu.:17.3   1st Qu.:17.55
##  Median :25.75   Median :12.20   Median :21.3   Median :20.40
##  Mean   :25.87   Mean   :12.55   Mean   :21.0   Mean   :20.84
##  3rd Qu.:28.70   3rd Qu.:14.90   3rd Qu.:25.2   3rd Qu.:23.20
##  Max.   :38.90   Max.   :24.90   Max.   :34.2   Max.   :36.60
##  NA's   :18      NA's   :17      NA's   :17     NA's   :27
##       L2_6            H2_6            B2_6           C2_6
##  Min.   : 9.70   Min.   : 6.30   Min.   :-9.60   Min.   : 9.20
##  1st Qu.:19.50   1st Qu.:13.30   1st Qu.: 7.30   1st Qu.:17.10
##  Median :22.55   Median :16.20   Median :12.50   Median :19.80
##  Mean   :22.65   Mean   :16.89   Mean   :11.96   Mean   :20.13
##  3rd Qu.:26.15   3rd Qu.:19.52   3rd Qu.:16.95   3rd Qu.:22.77
##  Max.   :39.80   Max.   :31.50   Max.   :29.20   Max.   :37.70
##  NA's   :18      NA's   :18      NA's   :18      NA's   :28
##      Ttkg_6           dL_6             dH_6             dB_6
##  Min.   : 51.00   Min.   :-21.200   Min.   :-19.200   Min.   :-3.700
##  1st Qu.: 65.00   1st Qu.:  1.200   1st Qu.: -6.575   1st Qu.: 6.300
##  Median : 73.00   Median :  3.000   Median : -3.950   Median : 8.850
##  Mean   : 75.17   Mean   :  3.184   Mean   : -4.230   Mean   : 9.059
##  3rd Qu.: 82.00   3rd Qu.:  5.000   3rd Qu.: -2.125   3rd Qu.:11.400
##  Max.   :153.00   Max.   : 25.600   Max.   : 16.800   Max.   :27.000
##  NA's   :24       NA's   :16        NA's   :16        NA's   :16
##       dC_6              Tkor_7        Suly_7         BPD_7
##  Min.   :-15.8000          :154   Min.   :1567   Min.   :69.50
##  1st Qu.: -1.6250   31/2   :  4   1st Qu.:1903   1st Qu.:82.15
##  Median :  0.8000   226    :  3   Median :2052   Median :85.60
##  Mean   :  0.8099   238    :  3   Mean   :2104   Mean   :85.24
##  3rd Qu.:  3.1000   32/2   :  3   3rd Qu.:2267   3rd Qu.:87.82
##  Max.   : 21.7000   34/0   :  3   Max.   :3100   Max.   :98.30
##  NA's   :26         (Other): 48   NA's   :133    NA's   :7
##      FRO_7            HC_7             AC_7           FEMU_7
##  Min.   : 11.3   Min.   :  9.39   Min.   :179.4   Min.   :51.20
##  1st Qu.:103.0   1st Qu.:297.15   1st Qu.:278.6   1st Qu.:60.80
##  Median :106.3   Median :304.30   Median :289.4   Median :63.10
##  Mean   :105.6   Mean   :302.62   Mean   :289.6   Mean   :63.31
##  3rd Qu.:109.3   3rd Qu.:312.50   3rd Qu.:302.6   3rd Qu.:65.55
##  Max.   :119.1   Max.   :345.30   Max.   :363.6   Max.   :74.96
##  NA's   :7       NA's   :7        NA's   :7       NA's   :7
##       L1_7            H1_7            B1_7           C1_7
##  Min.   :16.90   Min.   : 4.10   Min.   : 4.10   Min.   :11.20
##  1st Qu.:22.95   1st Qu.:10.70   1st Qu.:16.80   1st Qu.:17.70
##  Median :26.05   Median :12.50   Median :20.40   Median :20.20
##  Mean   :26.34   Mean   :13.42   Mean   :20.36   Mean   :20.95
##  3rd Qu.:29.27   3rd Qu.:16.50   3rd Qu.:24.00   3rd Qu.:23.90
##  Max.   :42.10   Max.   :23.30   Max.   :39.00   Max.   :41.00
##  NA's   :16      NA's   :16      NA's   :16      NA's   :28
##       L2_7            H2_7            B2_7           C2_7
##  Min.   : 5.30   Min.   : 6.80   Min.   :-8.100   Min.   : 8.00
##  1st Qu.:19.10   1st Qu.:14.43   1st Qu.: 6.625   1st Qu.:17.30
##  Median :22.30   Median :17.50   Median :12.300   Median :19.95
##  Mean   :22.76   Mean   :17.62   Mean   :11.497   Mean   :20.41
##  3rd Qu.:25.98   3rd Qu.:20.30   3rd Qu.:16.875   3rd Qu.:22.95
```

```
##  Max.   :38.50   Max.   :33.00   Max.   :31.200   Max.   :34.80
##  NA's   :16      NA's   :16      NA's   :16       NA's   :28
##      Ttkg_7            dL_7             dH_7              dB_7
##  Min.   : 55.00   Min.   :-6.500   Min.   :-18.200   Min.   :-7.300
##  1st Qu.: 67.00   1st Qu.: 1.500   1st Qu.: -6.275   1st Qu.: 5.325
##  Median : 75.00   Median : 3.450   Median : -3.700   Median : 8.400
##  Mean   : 77.35   Mean   : 3.582   Mean   : -4.198   Mean   : 8.866
##  3rd Qu.: 85.00   3rd Qu.: 5.175   3rd Qu.: -2.100   3rd Qu.:12.200
##  Max.   :155.00   Max.   :21.100   Max.   :  3.700   Max.   :28.400
##  NA's   :23       NA's   :16       NA's   :16        NA's   :16
##       dC_7             Tkor_8        Súly_8         BPD_8
##  Min.   :-8.8000          :157   Min.   :2314   Min.   : 49.40
##  1st Qu.:-1.4500   36/3   :  4   1st Qu.:2776   1st Qu.: 89.60
##  Median : 0.8000   240    :  3   Median :2990   Median : 91.80
##  Mean   : 0.5377   37/3   :  3   Mean   :2991   Mean   : 92.00
##  3rd Qu.: 2.5000   238    :  2   3rd Qu.:3147   3rd Qu.: 94.96
##  Max.   :17.6000   250    :  2   Max.   :3804   Max.   :105.90
##  NA's   :27        (Other): 47   NA's   :132    NA's   :11
##      FRO_8            HC_8            AC_8           FEMU_8
##  Min.   : 11.2   Min.   : 43.6   Min.   : 11.3   Min.   : 30.70
##  1st Qu.:110.0   1st Qu.:319.3   1st Qu.:317.5   1st Qu.: 68.80
##  Median :113.1   Median :327.6   Median :326.0   Median : 70.90
##  Mean   :112.1   Mean   :328.4   Mean   :320.4   Mean   : 71.98
##  3rd Qu.:116.7   3rd Qu.:336.6   3rd Qu.:338.3   3rd Qu.: 73.30
##  Max.   :219.4   Max.   :915.3   Max.   :371.5   Max.   :298.80
##  NA's   :11      NA's   :11      NA's   :11      NA's   :12
##       L1_8             H1_8            B1_8            C1_8
##  Min.   :16.20   Min.   : 2.30   Min.   :-1.30   Min.   : 0.20
##  1st Qu.:23.80   1st Qu.:11.75   1st Qu.:15.57   1st Qu.:17.60
##  Median :26.60   Median :14.00   Median :18.95   Median :20.00
##  Mean   :26.85   Mean   :14.53   Mean   :19.24   Mean   :20.74
##  3rd Qu.:29.70   3rd Qu.:17.12   3rd Qu.:22.80   3rd Qu.:23.90
##  Max.   :43.20   Max.   :28.20   Max.   :45.10   Max.   :39.00
##  NA's   :18      NA's   :18      NA's   :18      NA's   :22
##       L2_8             H2_8            B2_8            C2_8
##  Min.   :11.40   Min.   :-6.20   Min.   :-9.00   Min.   : 9.40
##  1st Qu.:20.30   1st Qu.:14.07   1st Qu.: 6.25   1st Qu.:17.20
##  Median :24.10   Median :17.10   Median :10.80   Median :19.80
##  Mean   :23.86   Mean   :17.34   Mean   :10.60   Mean   :20.01
##  3rd Qu.:27.15   3rd Qu.:20.20   3rd Qu.:15.80   3rd Qu.:22.45
##  Max.   :44.90   Max.   :33.30   Max.   :36.80   Max.   :35.50
##  NA's   :18      NA's   :18      NA's   :19      NA's   :23
##      Ttkg_8            dL_8             dH_8              dB_8
##  Min.   : 54.00   Min.   :-6.000   Min.   :-13.300   Min.   :-3.700
##  1st Qu.: 70.00   1st Qu.: 1.100   1st Qu.: -4.900   1st Qu.: 5.950
##  Median : 77.50   Median : 2.600   Median : -2.600   Median : 8.400
##  Mean   : 78.88   Mean   : 2.993   Mean   : -2.811   Mean   : 8.691
##  3rd Qu.: 86.00   3rd Qu.: 4.800   3rd Qu.: -1.100   3rd Qu.:10.600
##  Max.   :156.00   Max.   :14.500   Max.   : 21.600   Max.   :23.800
##  NA's   :31       NA's   :18       NA's   :18        NA's   :18
##       dC_8              X              L1_9            H1_9
##  Min.   :-19.1000      :217   Min.   :13.30   Min.   : 3.60
##  1st Qu.: -1.4000   ---:  1   1st Qu.:21.60   1st Qu.:10.70
##  Median :  0.9000             Median :24.80   Median :13.40
```

```
##  Mean   :  0.8342            Mean   :24.59   Mean   :13.57
##  3rd Qu.:  3.0000            3rd Qu.:27.40   3rd Qu.:16.40
##  Max.   : 22.9000            Max.   :40.60   Max.   :23.90
##  NA's   :22                  NA's   :65      NA's   :65
##       B1_9            C1_9            L2_9            H2_9
##  Min.   :-0.80   Min.   : 3.90   Min.   : 9.10   Min.   : 6.30
##  1st Qu.:17.90   1st Qu.:18.38   1st Qu.:17.20   1st Qu.:13.60
##  Median :20.90   Median :21.30   Median :21.70   Median :16.10
##  Mean   :20.74   Mean   :21.39   Mean   :21.72   Mean   :17.07
##  3rd Qu.:24.50   3rd Qu.:24.00   3rd Qu.:25.80   3rd Qu.:20.60
##  Max.   :37.30   Max.   :42.70   Max.   :40.80   Max.   :29.30
##  NA's   :65      NA's   :70      NA's   :65      NA's   :65
##       B2_9            C2_9           Ttkg_9           dL_9
##  Min.   :-18.2   Min.   :-0.50   Min.   : 48.00   Min.   :-5.800
##  1st Qu.:  6.4   1st Qu.:16.77   1st Qu.: 61.00   1st Qu.: 0.600
##  Median : 13.6   Median :18.85   Median : 70.00   Median : 2.800
##  Mean   : 11.6   Mean   :19.34   Mean   : 73.74   Mean   : 2.875
##  3rd Qu.: 17.6   3rd Qu.:23.10   3rd Qu.: 83.00   3rd Qu.: 5.100
##  Max.   : 28.9   Max.   :31.00   Max.   :172.00   Max.   :11.600
##  NA's   :65      NA's   :66      NA's   :130      NA's   :65
##       dH_9             dB_9            dC_9
##  Min.   :-23.600   Min.   :-5.500   Min.   :-26.700
##  1st Qu.: -6.000   1st Qu.: 5.700   1st Qu.: -1.200
##  Median : -2.900   Median : 8.800   Median :  1.700
##  Mean   : -3.494   Mean   : 9.135   Mean   :  1.476
##  3rd Qu.: -0.400   3rd Qu.:12.100   3rd Qu.:  3.800
##  Max.   :  6.000   Max.   :32.300   Max.   : 22.800
##  NA's   :65        NA's   :65       NA's   :65
```

1. Hüvelyi szülés után a medencefenék izmai megnyúlnak a császármetszéshez képest.

TODO: abszolút érték vagy sem?

```
csoport = Sz_mod
valt = dL_9
valt_PVN = valt[csoport=="PVN"]
valt_SC  = valt[csoport=="SC"]
```

Leíró statisztikák

```
table(csoport)
```

```
## csoport
##     PVN  SC
##   3 108 107
```

```
summary(valt_PVN)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  -3.700   2.375   4.300   4.303   6.600  11.300      32
```

```
summary(valt_SC)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  -5.800  -0.100   1.500   1.465   3.200  11.600      30
```

```
sd(valt,na.rm=TRUE)
```

```
## [1] 3.561687
```

```
sd(valt_PVN,na.rm=T)
```

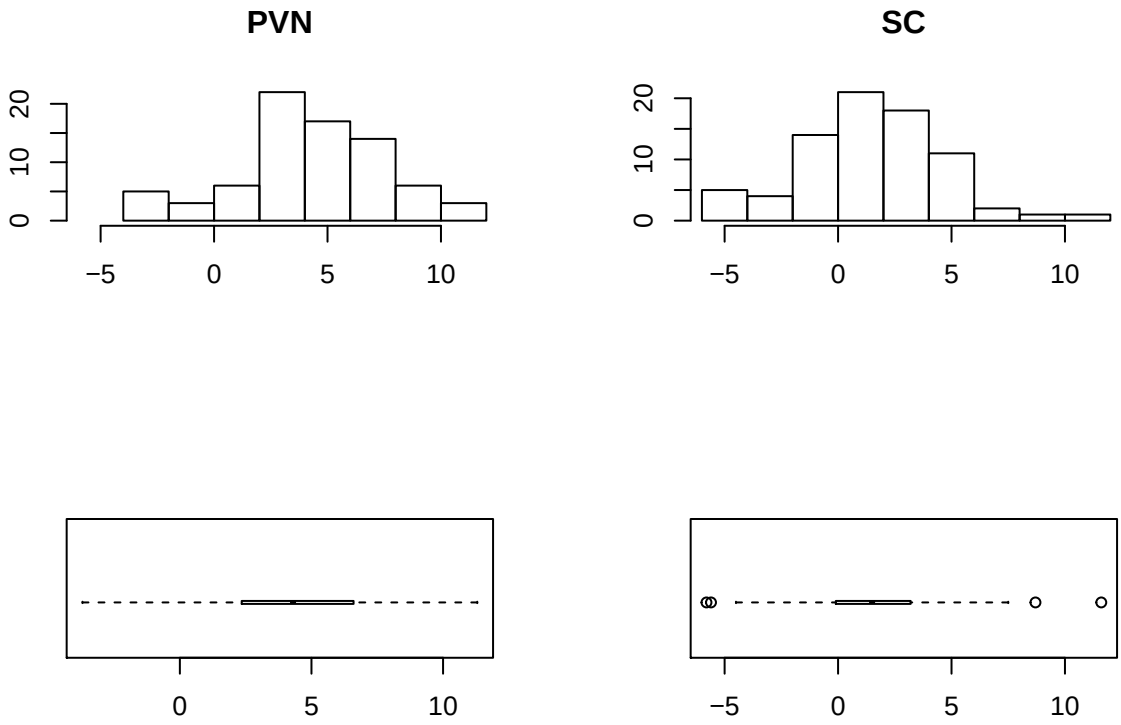
```
## [1] 3.361489
```

```
sd(valt_SC,na.rm=T)
```

```
## [1] 3.188333
```

Grafikonok

```
par(mfrow=c(2,2))
lim=c(min(min(valt_PVN,na.rm=T),min(valt_SC,na.rm=T)),max(max(valt_PVN,na.rm=T),max(valt_SC,na.rm=T)))
hist(valt_PVN,xlab="",ylab="",main="PVN",xlim=lim);hist(valt_SC,xlab="",ylab="",main="SC",xlim=lim)
boxplot(valt_PVN,horizontal=T,xlim=lim); boxplot(valt_SC,horizontal=T,xlim=lim)
```




```
par(mfrow=c(1,1))
```

Egyoldalas páros t-próba

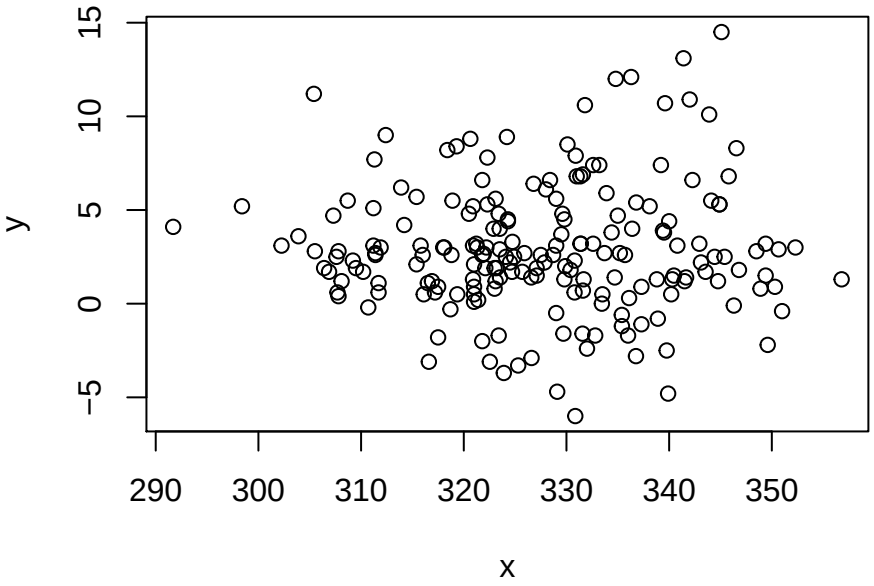
```
t.test(valt~csoport,alternative = "greater")
```

```
##
##  Welch Two Sample t-test
##
## data:  valt by csoport
## t = 5.3576, df = 150.346, p-value = 1.553e-07
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  1.961624      Inf
## sample estimates:
## mean in group PVN  mean in group SC
##          4.303421          1.464935
```

2. Az újszülött súlya szignifikáns összefüggést mutat a medencefenék izmainak megnyúlásával. A nagyobb születési súllyal megnő a medencefenék izmainak megnyúlása.

TODO túl magas és túl alacsony HC_8 értékek?

```
x = HC_8[HC_8<900 & HC_8>200]
y = dL_8[HC_8<900 & HC_8>200]
plot(x,y)
```




```
cor.test(x,y)
```

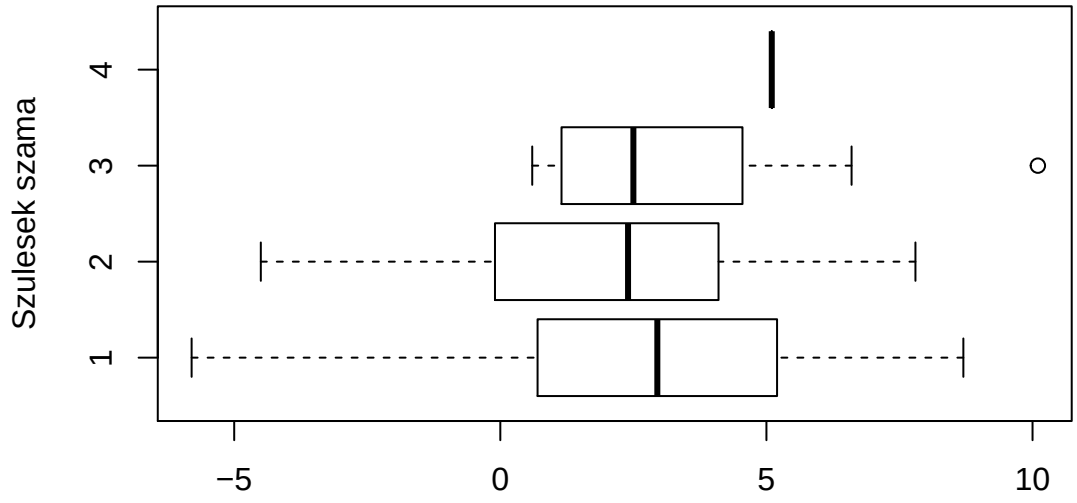
```
##
##  Pearson's product-moment correlation
##
## data:  x and y
## t = 0.259, df = 195, p-value = 0.7959
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1215666  0.1579305
## sample estimates:
##        cor
## 0.01854422
```

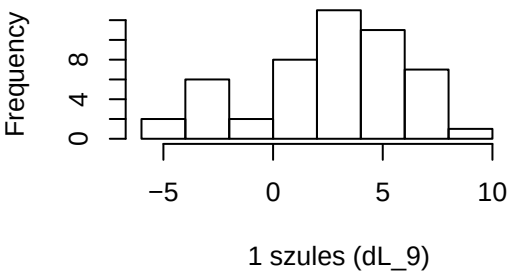
3. A szülések számával arányosan nő a medencefenék izmainak megnyúlása.

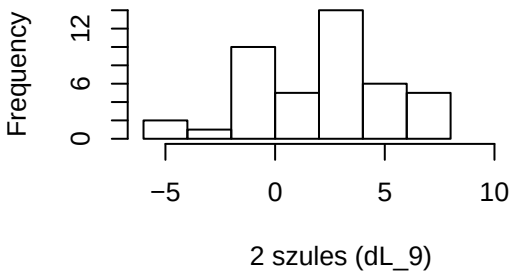
```
csoport = Pa + Cae; x = dL_9; table(csoport)
```

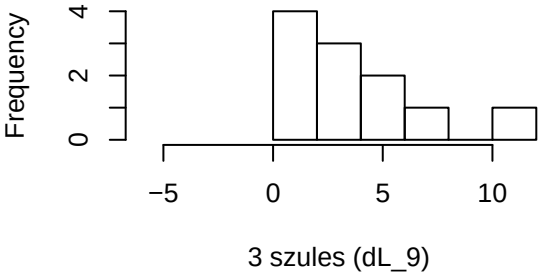
```
## csoport
##  1  2  3  4
## 73 62 17  1
```

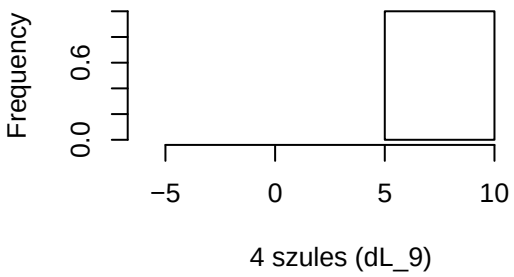
Ábrák











Egyszempontos ANOVA

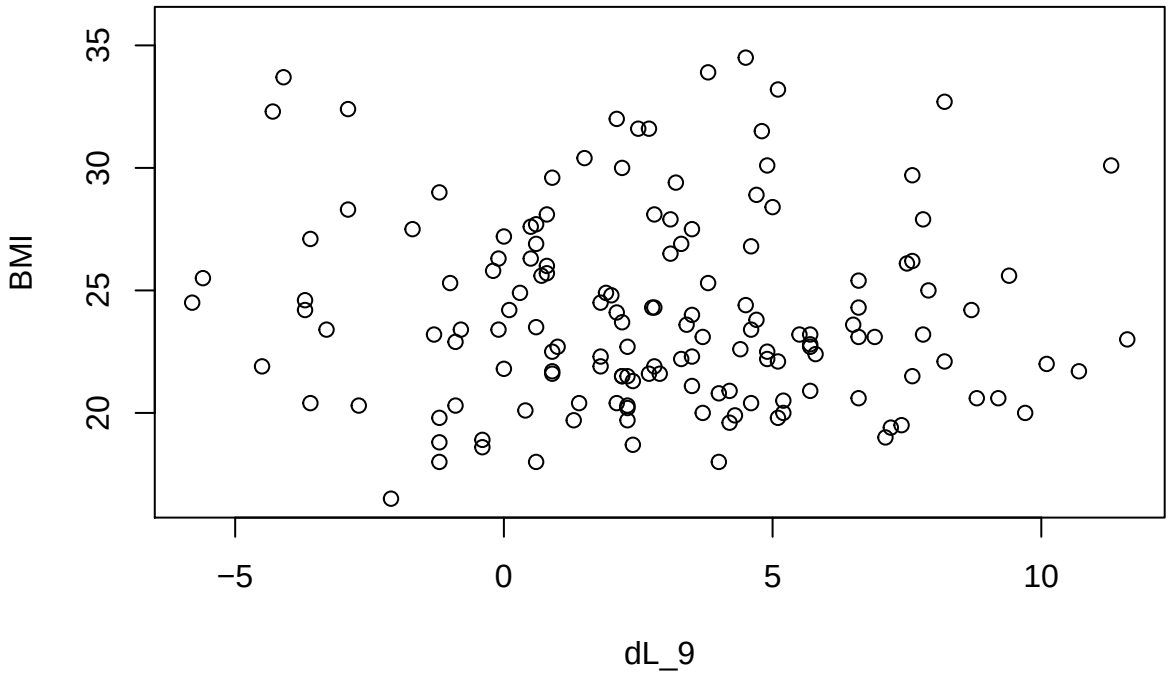
```
fit = aov(x~csoport)
summary(fit)
```

```
##              Df Sum Sq Mean Sq F value Pr(>F)
## csoport       1    3.8   3.775   0.335  0.564
## Residuals   103 1162.0  11.281
## 113 observations deleted due to missingness
```

4. Az anyai BMI-vel arányosan nő a medencefenék izmainak megnyúlása.

TODO adatok tisztítása! (túl magas BMI-k, pontatlan súly miatt)

```
x = dL_9[BMI<37]
y = BMI[BMI<37]
plot(x,y,xlab="dL_9",ylab="BMI")
```

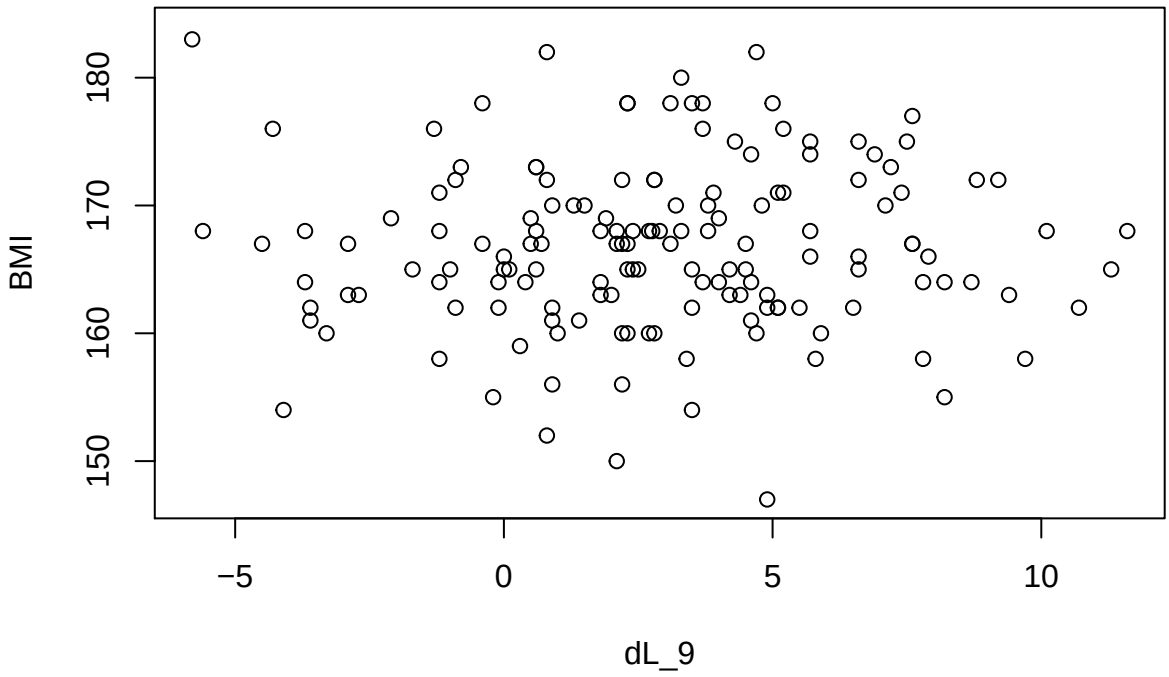



```
cor.test(x,y)
```

```
##
##  Pearson's product-moment correlation
##
## data:  x and y
## t = -0.7234, df = 147, p-value = 0.4706
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.2182671  0.1022215
## sample estimates:
##         cor
## -0.05955745
```

9. Az izommegnyúlás mértéke korrelál a testmagassággal.

```
x = dL_9
y = Mag
plot(x,y,xlab="dL_9",ylab="BMI")
```




```
cor.test(x,y)
```

```
##
##  Pearson's product-moment correlation
##
## data:  x and y
## t = 0.2915, df = 150, p-value = 0.771
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1359186  0.1823070
## sample estimates:
##        cor
## 0.02379702
```

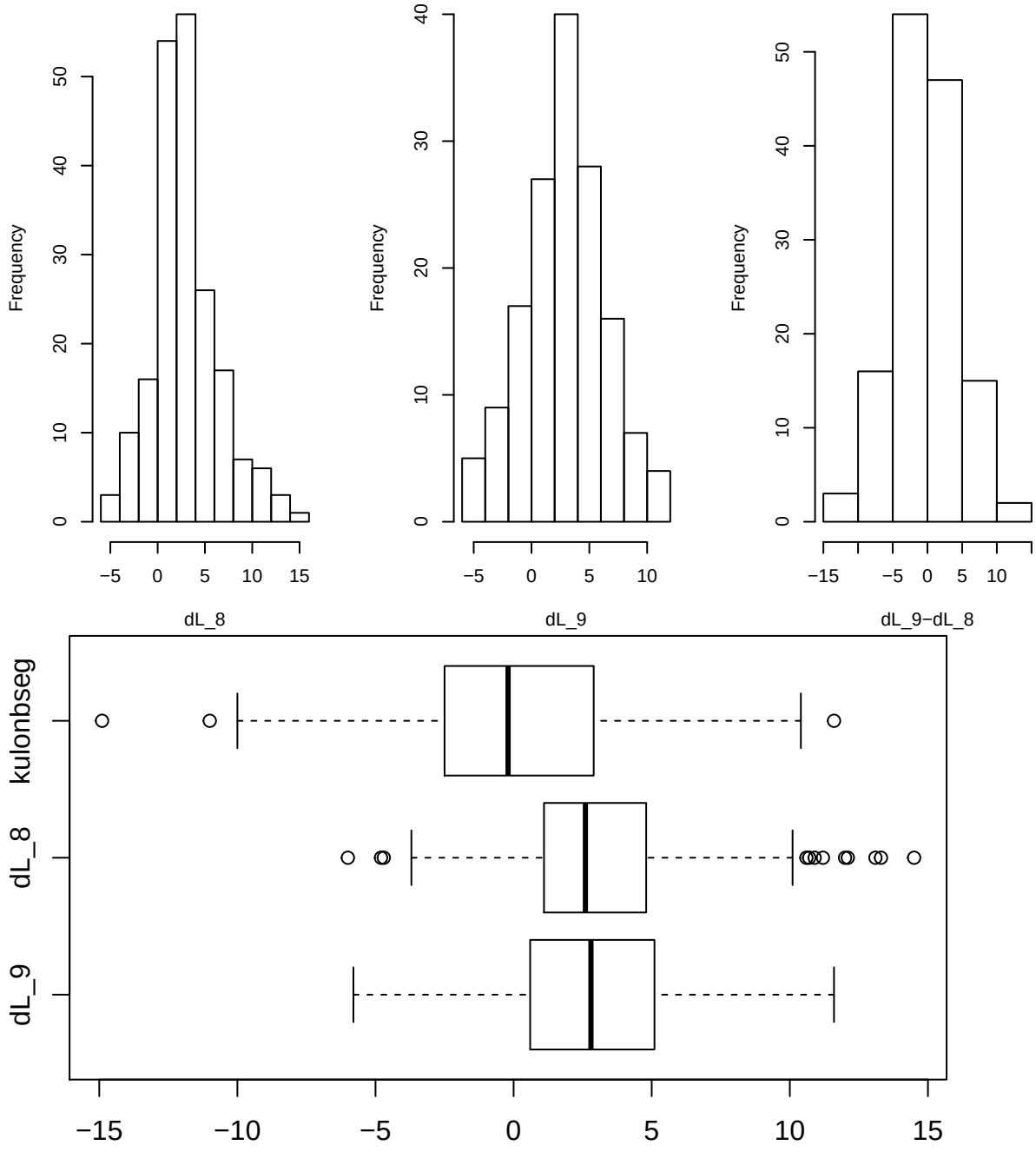
5. A terhességi korral arányosan növekszig a medencefenék izmainak megnyúlása (mondjuk az első trimeszterbeli értékeket kellene összevetni a szülés előttivel).

TODO

6. A szülés előtti medencefenék (36. hetes UH) megnyúlása nagyobb a szülés utáni 6 hetes kontrollhoz képest.

```
kontroll_6hetes = dL_9
szules_elott = dL_8
kul = szules_elott - kontroll_6hetes
```

Ábrák



Páros t-próba

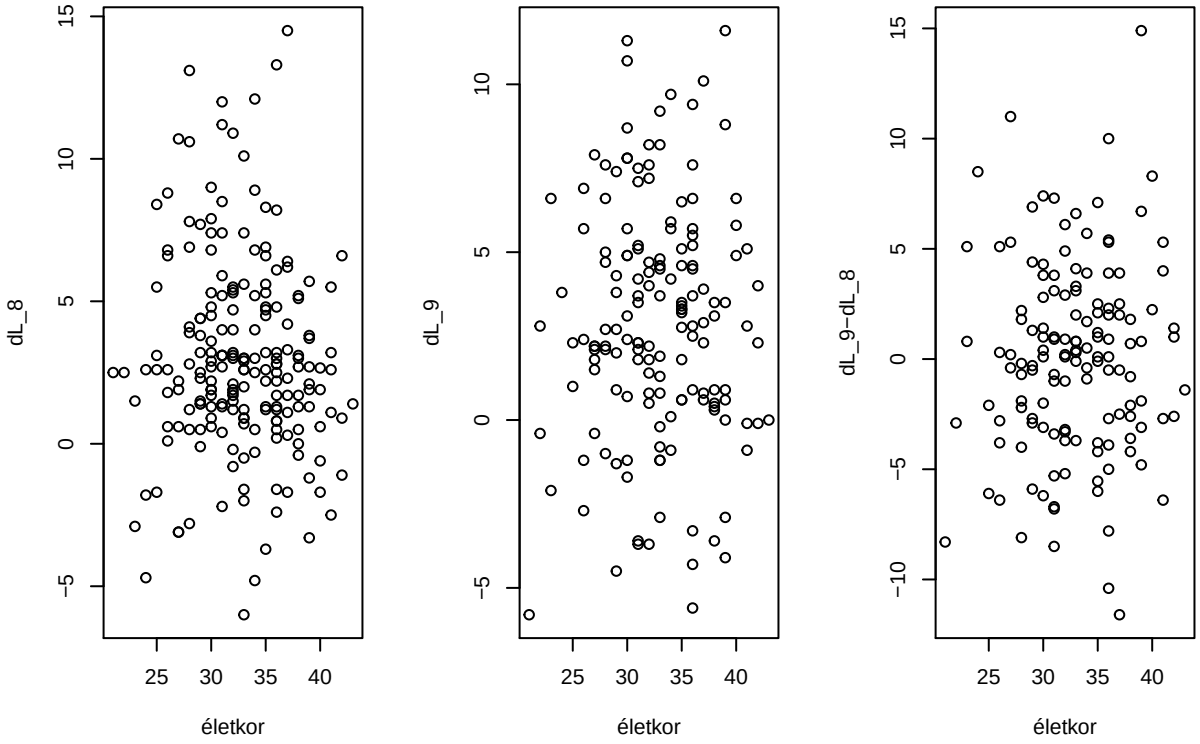
```
t.test(kontroll_6hetes,szules_elott,alternative="greater",paired=TRUE)
```

```
##
##  Paired t-test
##
## data:  kontroll_6hetes and szules_elott
## t = 0.1897, df = 136, p-value = 0.4249
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  -0.5529987        Inf
## sample estimates:
## mean of the differences
##              0.07153285
```

7-8. Fiatalabb várandósoknál kisebb mértékű az izmok megnyúlása, mint az idősebbeknél. Fiatal várandósoknál nagyobb a szülés előtt és a szülés után mért izomnyúlás közötti különbség, mint az idősebb várandósoknál. (jobb a regenerációs hajlam fiatalabb korban)

```
x = Ek
y1 = dL_8
y2 = dL_9
yd = y2-y1
```

Ábrák



Korreláció vizsgálatok

```
cor.test(x,y1)
```

```
##
##  Pearson's product-moment correlation
##
## data:  x and y1
## t = -0.9001, df = 198, p-value = 0.3692
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.2007966  0.0755764
## sample estimates:
##         cor
## -0.06383395
```

```
cor.test(x,y2)
```

```
##
##  Pearson's product-moment correlation
##
## data:  x and y2
## t = 0.101, df = 151, p-value = 0.9197
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1506567  0.1666787
## sample estimates:
##         cor
## 0.008217919
```

```
cor.test(x,yd)
```

```
##
##  Pearson's product-moment correlation
##
## data:  x and yd
## t = 0.5973, df = 135, p-value = 0.5513
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.1173896  0.2171821
## sample estimates:
##        cor
## 0.05133657
```

10. Szülés módja alapján a dL_9-dL_8 értékek nőnek hüvelyi szülés esetén

Leíró statisztikák

```
csoport = Sz_mod
valt = dL_9-dL_8
valt_PVN = valt[csoport=="PVN"]
valt_SC = valt[csoport=="SC"]
summary(valt);summary(valt_PVN);summary(valt_SC)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.      NA's
## -11.60000  -2.90000   0.20000   0.07153   2.50000  14.90000        81
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  -8.500  -0.600   1.000   1.412   3.950  11.000      41
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
## -11.600  -3.550  -1.200  -1.211   1.300  14.900      37
```

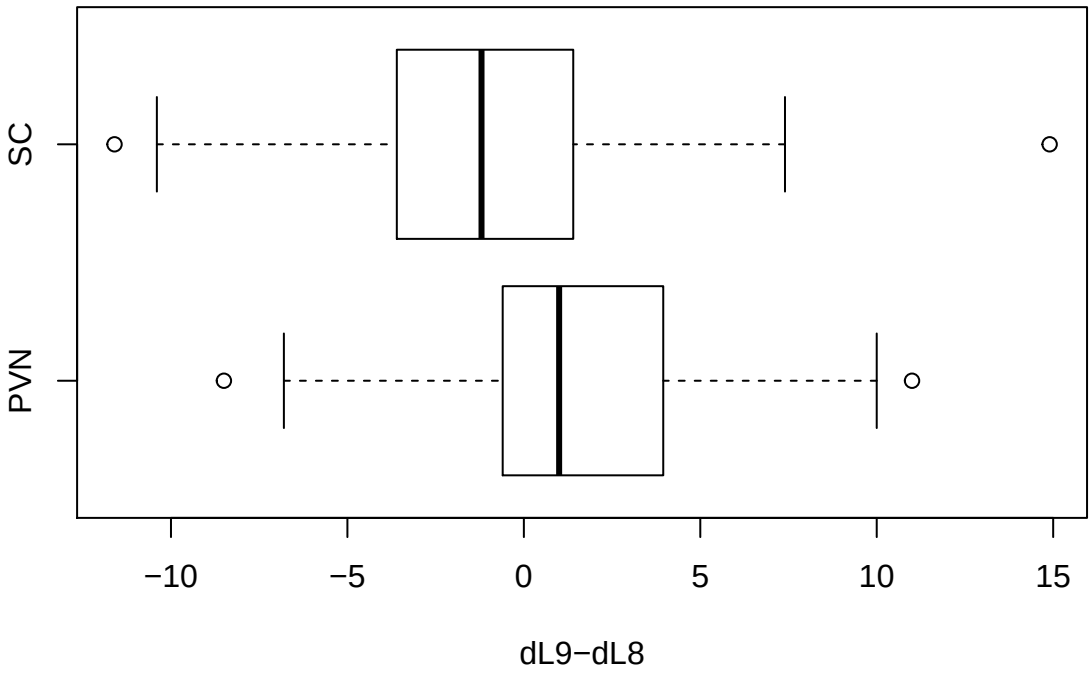
```
sd(valt,na.rm=TRUE);sd(valt_PVN,na.rm=TRUE);sd(valt_SC,na.rm=TRUE)
```

```
## [1] 4.413864
```

```
## [1] 4.166042
```

```
## [1] 4.287648
```

Ábrák



Kétmintás t-próba

```
t.test(valt_PVN,valt_SC,alternative="greater")
```

```
##
##  Welch Two Sample t-test
##
## data:  valt_PVN and valt_SC
## t = 3.6321, df = 134.968, p-value = 0.0001991
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  1.427133      Inf
## sample estimates:
## mean of x mean of y
##  1.411940 -1.211429
```