```
  ___  ____  ____  ____  ____(R)
 /__    /   ____/   /   ____/
___/   /   /___/   /   /___/
  Statistics/Data Analysis
```

```
  1 . do "C:\Users\lutib\AppData\Local\Temp\STD1880_000000.tmp"

  2 .
  3 . // EXERCICE 1
  4 .
  5 . // Q1
  6 . //a
  7 . /*
    > This affirmation is true:
    > The distribution of incomes of the group 2 is similar to that of the first group,
    > except that incomes are multiplied  by a scale of 2. Since the relative inequality indices, as the Gin
    > i index,
    > obey to the scale invariance principle, the inequality of the two groups will be the same.
    > */
  8 . clear

  9 . input group inc1 inc2 inc3

             group       inc1       inc2       inc3
      1. 1 2 16 2
      2. 1 4 16 4
      3. 1 18 16 18
      4. 2 4 32 2
      5. 2 8 32 4
      6. 2 36 32 18
      7. end

 10 .
 11 . igini inc1 , hg(group)

        Index            :  Gini index
        Group variable   :  group
```

Group	Estimate	STE	LB	UB
1: 1	**0.444444**	**0.100411**	**0.186331**	**0.702558**
2: 2	**0.444444**	**0.100411**	**0.186331**	**0.702558**
Population	0.500000	0.069166	0.322203	0.677797

```
 12 .
 13 . //b
 14 . /*
    > This affirmation is false:
    > When the averages of  incomes of the two groups are different,
    > we also must consider the contribution of the between group inequality to the total inequality.
    > */
 15 .
 16 . //c
 17 . /*
    > This affirmation is true:
    > - With the inc1, the between group inequality is the inequality of the distribution: D1: (8,8,8,16,16,
    > 16)
    > - With the inc2, the between group inequality is the inequality of the distribution: D2: (16,16,16,32,
    > 32,32)
    >   Based on the scale invariance principle (the distribution D2 is simply that of the double of the inc
    > omes of D1),
    >   The between group inequality in inc1 is similar to that in inc2.
    >  */
```

18 . dentropyg inc1, hg(group)

Decomposition of the Generalised Entropy Index by Groups
Group variable : group
Parameter theta : 0.00

Group	Entropy index	Population share	(mu_k/mu)^theta	Absolute contribution	Relative contribution
1: Group_1	**0.422837**	**0.500000**	**1.000000**	**0.211419**	**0.438875**
	0.114650	0.223607	0.000000	0.110570	0.239108
2: Group_2	**0.422837**	**0.500000**	**1.000000**	**0.211419**	**0.438875**
	0.114650	0.223607	0.000000	0.110570	0.252003
Within	---	---	**---**	**0.422837**	**0.877750**
	---	---	**---**	0.155451	---
Between	---	---	**---**	**0.058892**	**0.122250**
	---	---	**---**	0.005921	---
Population	**0.481729**	**1.000000**	**---**	**0.481729**	**1.000000**
	0.155563	0.000000	**---**	0.155563	0.000000

19 . dentropyg inc2, hg(group)

Decomposition of the Generalised Entropy Index by Groups
Group variable : group
Parameter theta : 0.00

Group	Entropy index	Population share	(mu_k/mu)^theta	Absolute contribution	Relative contribution
1: Group_1	**-0.000000**	**0.500000**	**1.000000**	**-0.000000**	**-0.000000**
	.	0.223607	0.000000	0.000000	0.000000
2: Group_2	**-0.000000**	**0.500000**	**1.000000**	**-0.000000**	**-0.000000**
	0.000000	0.223607	0.000000	0.000000	0.000000
Within	---	---	**---**	**-0.000000**	**-0.000000**
	---	---	**---**	.	---
Between	---	---	**---**	**0.058892**	**1.000000**
	---	---	**---**	0.005921	---
Population	**0.058892**	**1.000000**	**---**	**0.058892**	**1.000000**
	0.005921	0.000000	**---**	0.005921	0.000000

20 .
21 . // Q2
22 .
23 . dentropyg inc1, hg(group) theta(0)

Decomposition of the Generalised Entropy Index by Groups
Group variable : group
Parameter theta : 0.00

Group	Entropy index	Population share	(mu_k/mu)^theta	Absolute contribution	Relative contribution
1: Group_1	**0.422837**	**0.500000**	**1.000000**	**0.211419**	**0.438875**
	0.114650	0.223607	0.000000	0.110570	0.239108
2: Group_2	**0.422837**	**0.500000**	**1.000000**	**0.211419**	**0.438875**
	0.114650	0.223607	0.000000	0.110570	0.252003
Within	---	---	**---**	**0.422837**	**0.877750**
	---	---	**---**	0.155451	---

Between	--- ---	--- ---	**---** **---**	**0.058892** 0.005921	**0.122250** ---
Population	**0.481729** 0.155563	**1.000000** 0.000000	**---** **---**	**0.481729** 0.155563	**1.000000** 0.000000

24 . dentropyg inc2, hg(group) theta(0)

Decomposition of the Generalised Entropy Index by Groups
Group variable : group
Parameter theta : 0.00

Group	Entropy index	Population share	(mu_k/mu)^theta	Absolute contribution	Relative contribution
1: Group_1	**-0.000000** .	**0.500000** 0.223607	**1.000000** 0.000000	**-0.000000** 0.000000	**-0.000000** 0.000000
2: Group_2	**-0.000000** 0.000000	**0.500000** 0.223607	**1.000000** 0.000000	**-0.000000** 0.000000	**-0.000000** 0.000000
Within	--- ---	--- ---	**---** **---**	**-0.000000** .	**-0.000000** ---
Between	--- ---	--- ---	**---** **---**	**0.058892** 0.005921	**1.000000** ---
Population	**0.058892** 0.005921	**1.000000** 0.000000	**---** **---**	**0.058892** 0.005921	**1.000000** 0.000000

25 . dentropyg inc3, hg(group) theta(0)

Decomposition of the Generalised Entropy Index by Groups
Group variable : group
Parameter theta : 0.00

Group	Entropy index	Population share	(mu_k/mu)^theta	Absolute contribution	Relative contribution
1: Group_1	**0.422837** 0.114650	**0.500000** 0.223607	**1.000000** 0.000000	**0.211419** 0.110570	**0.500000** 0.243290
2: Group_2	**0.422837** 0.114650	**0.500000** 0.223607	**1.000000** 0.000000	**0.211419** 0.110570	**0.500000** 0.243290
Within	--- ---	--- ---	**---** **---**	**0.422837** 0.081070	**1.000000** ---
Between	--- ---	--- ---	**---** **---**	**-0.000000** 0.000000	**-0.000000** ---
Population	**0.422837** 0.081070	**1.000000** 0.000000	**---** **---**	**0.422837** 0.081070	**1.000000** 0.000000

```
26 .
27 . // Q3
28 . igini inc1 inc2 inc3
```

Index : Gini index

Variable	Estimate	STE	LB	UB
1: GINI_inc1	**0.500000**	**0.069166**	**0.322203**	**0.677797**
2: GINI_inc2	**0.166667**	**0.024845**	**0.102800**	**0.230533**
3: GINI_inc3	**0.444444**	**0.071001**	**0.261930**	**0.626958**

```
29 .
30 .
31 .
32 . // EXERCICE 2
33 .
34 . // Q1
35 . clear

36 . input identifier pre_tax_income  hhsize nchild

      identif~r  pre_tax~e     hhsize     nchild
   1. 1 480 8 4
   2. 2 1200 10 6
   3. 3 460 6 4
   4. 4 2500 6 2
   5. 5 3800 8 2
   6. 6 560 8 4
   7. 7 1240 6 2
   8. 8 1760 8 6
   9. end

37 .
38 . /* Scenario A */
39 . gen pcincatA = pre_tax_income * (1.00-0.10)/hhsize

40 .
41 . scalar  un_revenu_A  = 12000*0.06/60

42 . scalar  child_all_A  = 12000*0.04/30

43 . gen     pcuincA  = hhsize*un_revenu_A/hhsize

44 . gen  pcallowA = nchild*child_all_A/hhsize

45 . gen dpcincA= pcincatA+ pcuincA+ pcallowA

46 .
47 . /* Scenario B */
48 . gen pcincatB = pre_tax_income * (1.00-0.10)/hhsize

49 . scalar  un_revenu_B  = 0
```

```
50 . scalar  child_all_B  = 12000*0.10/30

51 . gen     pcuincB  = hhsize*un_revenu_B/hhsize

52 . gen  pcallowB = nchild*child_all_B/hhsize

53 . gen dpcincB= pcincatB+ pcuincB+ pcallowB

54 .
55 .
56 . // Q2
57 . igini dpcincA dpcincB , hsize(hhsize)
```

Index : Gini index
Household size : hhsize

Variable	Estimate	STE	LB	UB
1: GINI_dpcincA	**0.353067**	**0.042274**	**0.253105**	**0.453028**
2: GINI_dpcincB	**0.348667**	**0.042336**	**0.248557**	**0.448776**

```
58 .
59 . // Q3
60 . diginis pcincatA pcuincA pcallowA, hsize(hhsize)
```

Decomposition of the Gini Index by Incomes Sources: Rao's (1969) Approach.
Household size : hhsize

Sources	Income Share	Concentration Index	Absolute Contribution	Relative Contribution
1: pcincatA	**0.900000**	**0.395556**	**0.356000**	**1.008308**
	0.028478	0.049440	0.042978	0.006154
2: pcuincA	**0.060000**	**0.000000**	**0.000000**	**0.000000**
	0.015088	0.000000	0.000000	0.000000
3: pcallowA	**0.040000**	**-0.073333**	**-0.002933**	**-0.008308**
	0.013684	0.077784	0.002248	0.006154
Total	**1.000000**	---	**0.353067**	**1.000000**
	0.000000	---	0.042274	0.000000

```
61 . diginis pcincatB pcuincB pcallowB, hsize(hhsize)
```

Decomposition of the Gini Index by Incomes Sources: Rao's (1969) Approach.
Household size : hhsize

Sources	Income Share	Concentration Index	Absolute Contribution	Relative Contribution
1: pcincatB	**0.900000**	**0.395556**	**0.356000**	**1.021032**
	0.033607	0.049440	0.044140	0.015775
2: pcuincB	**0.000000**	**0.000000**	**0.000000**	**0.000000**
	0.000000	.	0.000000	0.000000
3: pcallowB	**0.100000**	**-0.073333**	**-0.007333**	**-0.021033**
	0.033607	0.077784	0.005663	0.015775
Total	**1.000000**	---	**0.348667**	**1.000000**
	0.000000	---	0.042336	0.000000

```
62 .
63 . // Q4
64 . /*
   > The scenario B is with the highest reduction in inequality in disposable incomes.
   > This is because, this programme targets well the deprived or poor households, which are characterized
   > by a large number of children.
   > */
65 .
66 . // Q5
67 . // generating the per capita income without applying any program
68 . gen pcinc = pre_tax_income/hhsize

69 . difgt dpcincB pcinc, hsize1(hhsize)  hsize2(hhsize) pline1(100) pline2(100) alpha(0)
```

Variable	Estimate	Std. Err.	t	P>|t|	[95% Conf.	interval]	Pov. line
dpcincB	**.3666667**	**.1835415**	**1.99773**	**0.0859**	**-.06734**	**.8006734**	100
pcinc	**.3666667**	**.1835415**	**1.99773**	**0.0859**	**-.06734**	**.8006734**	100
diff.	**0**	**0**	**.**	**.**	**0**	**0**	---

```
70 .
71 . // Q6
72 . difgt dpcincB pcinc, hsize1(hhsize)  hsize2(hhsize) pline1(100) pline2(100) alpha(1)
```

Variable	Estimate	Std. Err.	t	P>|t|	[95% Conf.	interval]	Pov. line
dpcincB	**.0616667**	**.0374656**	**1.64596**	**0.1438**	**-.0269254**	**.1502588**	100
pcinc	**.1166667**	**.061366**	**1.90116**	**0.0990**	**-.0284408**	**.2617742**	100
diff.	**.055**	**.027522**	**1.9984**	**0.0858**	**-.0100792**	**.1200792**	---

```
73 . /*
   > The households that receive child allowances have some improvement in well-being, but this improvement
   >  is not enough to make them escape poverty.
   > This is what explains the unchanged level of headcount. In the inverse, the poverty gap index is sensi
   > tive to any improvement in the well-being of the poor, and this explains the reduction of this index.
   > */
74 .
75 .
76 . // EXERCICE 3
77 .
78 . //Stata code for the Practical exercise 3 - BLOC3
79 .
80 .  // Q1
81 . clear

82 .
   end of do-file

83 . use "C:\Users\lutib\Dropbox\PEP_distance_Poverty Course (Exercises)\2019\weaks_semaines 4-5-6\version\
   > data_3.dta"
```

```
84 . do "C:\Users\lutib\AppData\Local\Temp\STD1880_000000.tmp"

85 . svyset psu [pweight=sweight], strata(strata)

      pweight:  sweight
          VCE:  linearized
  Single unit:  missing
     Strata 1:  strata
         SU 1:  psu
        FPC 1:  <zero>

86 .
87 . // Q2
88 . ifgt ae_exp, pline(21000) hs(hsize)

    Poverty index   :  FGT index
    Household size  :  hsize
    Sampling weight :  sweight
    Parameter alpha :  0.00
```

Variable	Estimate	STE	LB	UB	Pov. line
ae_exp	**0.316088**	**0.013949**	**0.288713**	**0.343464**	21000.00

```
89 .
90 . // Q3
91 . ifgt ae_exp, pline(21000) hs(hsize) hgroup(sex)

    Poverty index   :  FGT index
    Household size  :  hsize
    Sampling weight :  sweight
    Group variable  :  sex
    Parameter alpha :  0.00
```

Group	Estimate	STE	LB	UB	Pov. line
1: Male	**0.301265**	**0.013811**	**0.274160**	**0.328370**	21000.00
2: Female	**0.370129**	**0.033178**	**0.305014**	**0.435243**	21000.00
Population	0.316088	0.013949	0.288713	0.343464	21000.00

```
92 .
93 .
   end of do-file

94 .
```