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

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

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

 8 . input group inc1 inc2 inc3

            group       inc1       inc2       inc3
      1. 1 1 2 2
      2. 1 2 2 4
      3. 1 9 2 18
      4. 2 3 6 2
      5. 2 6 6 4
      6. 2 27 6 18
      7. end

 9 .
10 . 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	0.534722	0.080462	0.327888	0.741557

```
11 .
12 . //b
13 . /*
   > This affirmation is false:
   > When the averages of incomes of the two groups are different, we must consider the contribution of the
   >  between group inequality to the total inequality.
   > */
14 .
15 . //c
16 . /*
   > This affirmation is true:
   > - With the inc1, the between group inequality is the inequality of the distribution: D1: (4,4,4,12,12,
   > 12)
   > - With the inc2, the between group inequality is the inequality of the distribution: D2: (2,2,2,6,6,6)
   >
   >   Based on the scale invariance principle (the distribution D2 is simply that of the half of the incom
   > es of D1),
   >   The between group inequality in inc1 is similar to that of inc2.
   >  */
```

17 . 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**	**0.373084**
	0.114650	0.223607	0.000000	0.110570	0.211759
2: Group_2	**0.422837**	**0.500000**	**1.000000**	**0.211419**	**0.373084**
	0.114650	0.223607	0.000000	0.110570	0.237621
Within	---	---	**---**	**0.422837**	**0.746168**
	---	---	**---**	0.214839	---
Between	---	---	**---**	**0.143841**	**0.253832**
	---	---	**---**	0.022050	---
Population	**0.566678**	**1.000000**	**---**	**0.566678**	**1.000000**
	0.215967	0.000000	**---**	0.215967	0.000000

18 . 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	.
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**
	---	---	**---**	0.000000	---
Between	---	---	**---**	**0.143841**	**1.000000**
	---	---	**---**	0.022050	---
Population	**0.143841**	**1.000000**	**---**	**0.143841**	**1.000000**
	0.022050	0.000000	**---**	0.022050	0.000000

19 .
20 . // Q2
21 .
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**	**0.373084**
	0.114650	0.223607	0.000000	0.110570	0.211759
2: Group_2	**0.422837**	**0.500000**	**1.000000**	**0.211419**	**0.373084**
	0.114650	0.223607	0.000000	0.110570	0.237621
Within	---	---	**---**	**0.422837**	**0.746168**

	---	---	---	0.214839	---
Between	--- ---	--- ---	**---** **---**	**0.143841** 0.022050	**0.253832** ---
Population	**0.566678** 0.215967	**1.000000** 0.000000	**---** **---**	**0.566678** 0.215967	**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** .
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	**-0.000000** ---
Between	--- ---	--- ---	**---** **---**	**0.143841** 0.022050	**1.000000** ---
Population	**0.143841** 0.022050	**1.000000** 0.000000	**---** **---**	**0.143841** 0.022050	**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

```
.
. // Q3
. igini inc1 inc2 inc3
```

Index : Gini index

Variable	Estimate	STE	LB	UB
1: GINI_inc1	**0.534722**	**0.080462**	**0.327888**	**0.741557**
2: GINI_inc2	**0.250000**	**0.055902**	**0.106300**	**0.393700**
3: GINI_inc3	**0.444444**	**0.071001**	**0.261930**	**0.626958**

```
.
.
.
.
. // EXERCICE 2
.
.
. // Q1
. clear

. input identifier pre_tax_income hhsize nchild nelderly

       identif~r  pre_tax~e     hhsize     nchild   nelderly
  1. 1 240  4 2 1
  2. 2 600  5 3 1
  3. 3 230  3 2 0
  4. 4 1250 3 1 1
  5. 5 1900 4 1 1
  6. 6 280  4 2 0
  7. 7 620  3 1 1
  8. 8 880  4 3 0
  9. end

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

.
. scalar  elder_pens_A  = 6000*0.02/30

. scalar  child_all_A  = 6000*0.08/15

.
.
.
. gen     pceldA   = nelderly*elder_pens_A/hhsize

. gen  pcallowA = nchild*child_all_A/hhsize

. gen dpcincA= pcincatA+ pceldA+ pcallowA

.
```

```
52 . /* Scenario B */
53 . gen pcincatB = pre_tax_income * (1.00-0.10)/hhsize

54 . scalar  elder_pens_B  = 6000*0.00/30

55 . scalar  child_all_B  = 6000*0.10/15

56 .
57 . gen     pceldB   = nelderly*elder_pens_B/hhsize

58 . gen  pcallowB = nchild*child_all_B/hhsize

59 . gen dpcincB= pcincatB+ pceldB+ pcallowB

60 .
61 .
62 . // Q2
63 . igini dpcincA dpcincB , hsize(hhsize)
```

Index   : Gini index
Household size   : hhsize

Variable	Estimate	STE	LB	UB
1: GINI_dpcincA	**0.356542**	**0.043298**	**0.254158**	**0.458927**
2: GINI_dpcincB	**0.348667**	**0.042336**	**0.248557**	**0.448776**

```
64 .
65 . // Q3
66 . diginis pcincatA pceldA 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	**0.915254**	**0.395556**	**0.362034**	**1.015402**
	0.028163	0.049440	0.044582	0.011868
2: pceldA	**0.003390**	**0.140000**	**0.000475**	**0.001331**
	0.001013	0.163075	0.000506	0.001416
3: pcallowA	**0.081356**	**-0.073333**	**-0.005966**	**-0.016733**
	0.027877	0.077784	0.004574	0.012486
Total	**1.000000**	**---**	**0.356542**	**1.000000**
	0.000000	---	0.043298	0.000000

```
67 . diginis pcincatB pceldB 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: pceldB	**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

```
68 .
69 . // Q4
70 . /*
   > The scenario B is with the highest reduction in inequality in disposable incomes.
   > This is because in scenario A,  the elderly pension program benefits target all of the elderly even if
   >  they are richer in general (in this example).
   > */
71 .
72 . // Q5
73 . // generating the per capita income without applying any program
74 . gen pcinc = pre_tax_income/hhsize

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

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

```
76 .
77 . // Q6
78 . difgt pcinc dpcincB , hsize1(hhsize)  hsize2(hhsize) pline1(100) pline2(100) alpha(1)
```

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

```
79 . /*
   > 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.
   > */
80 .
81 .
82 . // EXERCICE 3
83 .
84 . //Stata code for the Practical exercise 3 - BLOC3
85 .
86 .  // Q1
87 . clear

88 .
   end of do-file

89 . use "C:\Users\lutib\Dropbox\PEP_distance_Poverty Course (Exercises)\2019\weaks_semaines 4-5-6\version\
   > data_2.dta"
```

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

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

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

 92 . save, replace
    file C:\Users\lutib\Dropbox\PEP_distance_Poverty Course (Exercises)\2019\weaks_semaines 4-5-6\version\da
    > ta_2.dta saved

 93 .
 94 . // Q2
 95 . 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	**0.336664**	**0.015603**	**0.306042**	**0.367287**	21000.00

```
 96 .
 97 . // Q3
 98 . 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	**0.324918**	**0.015614**	**0.294274**	**0.355562**	21000.00
2: Female	**0.379359**	**0.035122**	**0.310428**	**0.448290**	21000.00
Population	0.336664	0.015603	0.306042	0.367287	21000.00

```
 99 .
100 .
    end of do-file

101 .
```