Generating instances for the SIRT Problem

The instances to obtain the optimal solution of the SIRT problem are generated with the characteristics referred in file *Testing_Environment_SIRT.pdf*.
Instances are generated using application *instance_generator*.
The file with the input data needed for the application is *input.txt*.
The output obtained when *instance_generator* runs is written in file *instance.txt*.

File *input.txt*

This file contains the following information:

Line 1 Number of countries
Line 2 Minimum number of operators
Line 3 Maximum number of operators
Line 4 Number of sets of operators considered (in this case 4 for all instances)
Line 5 Probabilities associated with each set (in this case 0.3 0.4 0.2 0.1 for all instances since we consider:
P(Number of operators = 2) = 0.30
P(Number of operators = 3) = 0.40
P(Number of operators = 4) = 0.20
P(Number of operators = 5) = 0.10
Line 6 Elements of each set of operators considered (in this case 2, 3, 4 and 5 for all instances)
Line 7 Number of volume tiers
Line 8 Lower bounds for the traffic volume tiers
Line 9 Upper bounds for the traffic volume tiers
Line 10 Probability associated to each traffic volume tier
Line 11 Lower bounds for the traffic volume tiers concerning the traffic received
Line 12 Upper bounds for the traffic volume tiers concerning the traffic received
Line 13 Number of time periods considered (in this case 12 for all instances)
Line 14 Number of seasonality types considered (in this case 3 for all instances)
Line 15 - Line 17 Matrix with the values considered for the 3 types of seasonality. Each line corresponds to a type of seasonality along the 12 time periods
Line 18 Market-share of each Operator when the number of operators is 2 (in the case the market-share distribution of each country is Uneven)
Line 19 Market-share of each Operator when the number of operators is 3 (in the case the market-share distribution of each country is Uneven)
Line 20 Market-share of each Operator when the number of operators is 4 (in the case the market-share distribution of each country is Uneven)
Line 21 Market-share of each Operator when the number of operators is 5 (in the case the market-share distribution of each country is Uneven)
Line 22 Maximum number of operators in a group (in this case 10 for all instances)
Line 23 Reference value of price level

File *instance.txt*

In this file the following information is written by order:
• Number of countries
• Total number of groups
• Total number of operators
• Number of time periods

For each country:
• Number of operators | Total forecasted traffic | Type of seasonality | Type of market share | Initial (yearly) evolution of traffic forecast sent to the country
For each time period:
• Forecasted traffic Type of country | Traffic volume sent in previous year | Correction over initial forecast for actual evolution of traffic

For each operator and for each time period:
• Traffic volume received

For each operator:
• External influencing factors | Responsiveness

For each operator and for each time period:
• Matrix with values between 0 and 1
(Values smaller than 0.5 make the external influence positive; values greater or equal to 0.5 make it negative)

For each country:
• Number of groups to which belong operators of the country
• The groups to which they belong

For each group:
• Total number of operators | Total volume traffic of previous year | Type of commercial agreement | Number of countries with operators in this group
• The corresponding countries

For each operator:
• Country | Volume of traffic | Group

For each group:
• Type of commercial agreement
• Number of volume-price tiers in agreement

Files *input_10.txt*, *input_50.txt* and *input_100.txt* were the ones used to generate respectively, instances for 10, 50 and 100 countries. These files must be renamed to *input.txt* in order to be used by application instance_generator. Files *instance_10_1.txt*, *instance_10_2.txt*, *instance_10_3.txt*, *instance_10_4.txt* and *instance_10_5.txt* correspond to the 10 countries' instances.

Files *instance_50_1.txt*, *instance_50_2.txt*, *instance_50_3.txt*, *instance_50_4.txt* and *instance_50_5.txt* correspond to the 50 countries' instances.
Files *instance_100_1.txt*, *instance_100_2.txt*, *instance_100_3.txt*, *instance_100_4.txt* and *instance_100_5.txt* correspond to the 100 countries' instances.