Minimum Latency Problem GILS-RVND Benchmark

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1 Execution Environmentão

1.1 Processor

The processor of the machine on which the program was executed was a *13th Gen Intel® Core™ i7-13650HX × 20*.

1.2 Operating System

The Operating System on which the program was executed was *Linux Ubuntu 25.04*. Additionally, the system provides three power modes: "Power Saver," "Balanced," and "Performance." The "Performance" mode was active throughout the entire execution time.

2 Results

2.1 Methodology Used

The `time.h` library was used to access the `clock()` function and the `CLOCKS_PER_SEC` macro. Two variables, `start` and `end`, of type $clock_t$, were created to store the values returned by `clock()` before and after calling the `GILS_RVND()` method, respectively. The execution time was then calculated as:

$$\text{CPU\_Time\_Used} = \frac{(\text{double})(\text{end} - \text{start})}{\text{CLOCKS\_PER\_SEC}} \tag{1}$$

Finally, each instance was executed ten times, and the average execution time was computed as the final result.

Table 1: Results for TSPLIB instances selected by Abeledo et al. (2010a,b)

Instance	**Abeledo et. al.**	**GILS-RVND**			
	OPT or UB	Best Sol.	Avg. Sol.	Avg. Gap (%)	Avg. Time (s)
dantzig42	12528	12528	12528.00	0.00	0.039
swiss42	22327	22327	22327.00	0.00	0.036
att48	209320	209320	209320.00	0.00	0.062
gr48	102378	102378	102378.00	0.00	0.071
hk48	247926	247926	247926.00	0.00	0.063
eil51	10178	10178	10190.60	0.12	0.098
berlin52	143721	143721	143721.00	0.00	0.081
brazil58	512361	512361	512361.00	0.00	0.117
st70	20557	20557	20557.00	0.00	0.238
eil76	17976	17976	17976.00	0.00	0.363
pr76	3455242	3455242	3455240.00	0.00	0.302
gr96	2097170	2097170	2097170.00	0.00	0.748
rat99	58288*	**57986**	**57986.00**	-0.52	1.184
kroA100	983128	983128	983128.00	0.00	0.930
kroB100	986008	986008	986008.00	0.00	1.000
kroC100	961324	961324	961324.00	0.00	0.915
kroD100	976965	976965	976965.00	0.00	0.963
kroE100	971266	971266	971266.00	0.00	0.990
rd100	340047	340047	340047.00	0.00	0.970
eil101	27519*	**27513**	**27513.00**	-0.02	1.380
lin105	603910	603910	603910.00	0.00	0.900
pr107	2026626	2026626	2026630.00	0.00	1.055

* Optimality is not proven for this instance