

# Exercise1 Report

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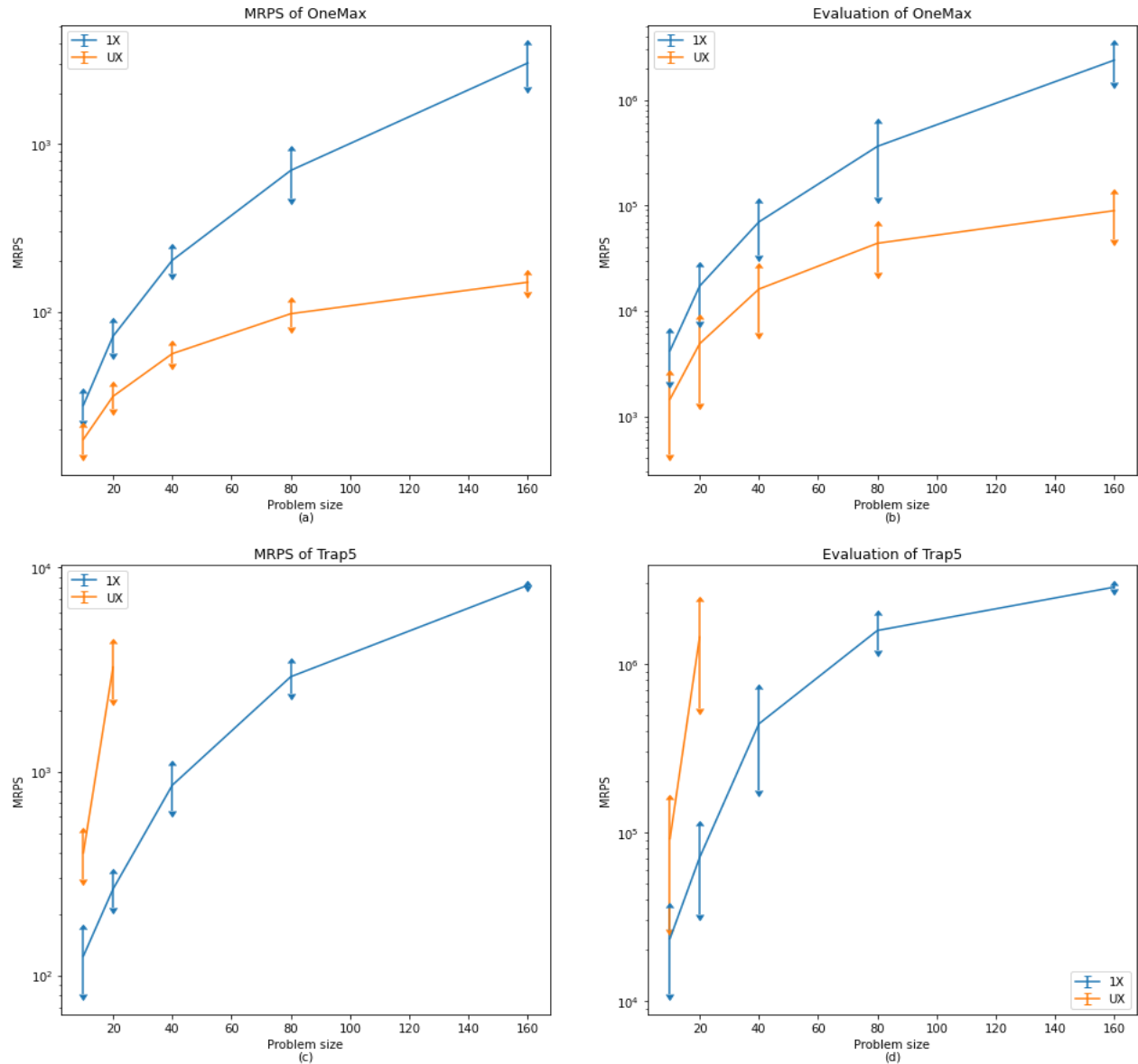


Figure 1. Result (a) MRPS Onemax 1X, UX (b) Evaluation Onemax 1X, UX  
(c) MRPS Trap5 1X, UX (d) Evaluation Trap5 1X, UX

	<b>1X</b>		<b>UX</b>	
<b>Population size</b>	<b>MRPS</b>	<b>Evaluation</b>	<b>MRPS</b>	<b>Evaluation</b>
10	27.8 ( $\pm 5.33$ )	4189.6 ( $\pm 2052.12$ )	17.4 ( $\pm 3.23$ )	1453.12 ( $\pm 1016.19$ )
20	71.6 ( $\pm 14.47$ )	17188.48 ( $\pm 9205.26$ )	31.4 ( $\pm 4.98$ )	4881.92 ( $\pm 3562.37$ )
40	203.2 ( $\pm 34.35$ )	69707.84 ( $\pm 35901.83$ )	56.4 ( $\pm 7.03$ )	16089.12 ( $\pm 9839.59$ )
80	697.6 ( $\pm 218.82$ )	362999.2 ( $\pm 243689.93$ )	97.6 ( $\pm 16.32$ )	43767.84 ( $\pm 20718.33$ )
160	3046.4 ( $\pm 844.8$ )	2385399.2 ( $\pm 919680.75$ )	150.4 ( $\pm 17.82$ )	89239.84 ( $\pm 41267.62$ )

*Table 1. Onemax*

	<b>1X</b>		<b>UX</b>	
<b>Population size</b>	<b>MRPS</b>	<b>Evaluation</b>	<b>MRPS</b>	<b>Evaluation</b>
10	124.8 (43.85)	23405.92 (12491.25)	400.0 (104.43)	91791.36(64980.83)
20	265.6 ( $\pm 51.2$ )	70874.24 ( $\pm 38262.7$ )	3251.2 ( $\pm 998.4$ )	1445796.96 ( $\pm 899714.33$ )
40	857.6 ( $\pm 210.71$ )	440847.36 ( $\pm 264417.82$ )	exceed	exceed
80	2918.4 ( $\pm 501.66$ )	1579909.44 ( $\pm 382582.37$ )	exceed	exceed
160	8192.0 ( $\pm 0.0$ )	2859996.0 ( $\pm 72778.4$ )	exceed	exceed

*Table 2. Trap5*

Thoughts:

Overall, after testing all four combinations, Onemax converges much faster than Trap5. With the given limited MRPS upper bound (8192), Onemax(1X, UX) passed all the tests while Trap5(UX) wasn't able to solve the 40, 80, 160 bits. 1X remains stable in both Onemax and Trap5.