Central Washington University, Department of Computer Science

CS471 Project 1

Nick Rohde

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1 Benchmark Functions

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$$\begin{aligned}(x+y)^3 &= (x+y)^2(x+y) \\ &= (x^2+2xy+y^2)(x+y) \\ &= (x^3+2x^2y+xy^2)+(x^2y+2xy^2+y^3) \\ &= x^3+3x^2y+3xy^2+y^3\end{aligned} \tag{1.1}$$

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1.1 Heading on level 2 (subsection)

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$$A = \begin{bmatrix} A_{11} & A_{21} \\ A_{21} & A_{22} \end{bmatrix} \tag{1.2}$$

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1.1.1 Heading on level 3 (subsubsection)

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Heading on level 4 (paragraph) Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

2 Lists

2.1 Example of list (3*itemize)

- First item in a list
  - First item in a list
    - First item in a list
    - Second item in a list
  - Second item in a list
- Second item in a list

2.2 Example of list (enumerate)

1. First item in a list
2. Second item in a list
3. Third item in a list

Table 2.1: Computation comparison of DE, GA and PSO

Problem	D_{10}					D_{20}					D_{30}				
	Avg	Median	Range	SD	T(s)	Avg	Median	Range	SD	T(s)	Avg	Median	Range	SD	T(s)
f_1	-61.8187	-46.7945	3177.65	596.766	4.33294e-6	2.34	2.16	2.39	0.08	1	2.38	2.36	2.4	0.02	1
f_2	3.30	2.13	4.48	0.72	1.08	3.25	3.15	3.3	0.06	2	3.29	3.24	3.3	0.02	2
f_3	4.81	0.97	7.45	1.77	2.31	4.15	3.73	4.61	0.28	1.25	4.24	3.88	4.67	0.25	1.25
f_4	6.23	4.86	7.36	0.89	3.54	5.36	4.94	5.83	0.28	2.5	5.75	5.43	6.12	0.23	2.5
f_5	6.62	4.48	8.40	1.42	4.63	5.55	5.25	5.87	0.2	5	6.03	5.74	6.34	0.2	5
f_6	2.24	1.00	3.74	0.95	8.31	0.37	0.03	0.79	0.24	2.5	1.42	1.04	1.86	0.26	2.5
f_7	5.90	4.67	7.94	0.93	17.08	3.9	3.59	4.25	0.21	5	5.17	4.92	5.56	0.21	5
f_8	5.14	4.00	6.01	0.62	28.42	3.62	3.36	3.88	0.16	10	4.68	4.39	5.01	0.19	10
f_9	4.03	2.56	5.49	1.09	195.33	1.29	1.04	1.58	0.17	10	3.09	2.8	3.47	0.2	10
f_{10}	3.99	2.82	4.81	0.66	243.33	2.17	1.99	2.35	0.11	20	3.57	3.31	3.86	0.17	20
f_{11}	3.23	2.53	4.03	0.46	435.34	1.19	1.08	1.34	0.08	50	2.47	2.16	2.78	0.2	50
f_{12}	3.23	2.53	4.03	0.46	435.34	1.19	1.08	1.34	0.08	50	2.47	2.16	2.78	0.2	50
f_{13}	3.23	2.53	4.03	0.46	435.34	1.19	1.08	1.34	0.08	50	2.47	2.16	2.78	0.2	50
f_{14}	3.23	2.53	4.03	0.46	435.34	1.19	1.08	1.34	0.08	50	2.47	2.16	2.78	0.2	50
f_{15}	3.23	2.53	4.03	0.46	435.34	1.19	1.08	1.34	0.08	50	2.47	2.16	2.78	0.2	50
Mean	4.03	2.55	5.57	0.97	78.35	2.79	2.54	3.05	0.16	9.15	3.54	3.3	3.82	0.17	9.15

[1] MacBook Pro, 2.3GHz Intel Core i7 (2nd gen), 8 GB RAM

[2] Pentium P-IV, 3.0 GHz, 512 MB