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Himmelblau's function

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In mathematical optimization, **Himmelblau's function** is a multi-modal function, used to test the performance of optimization algorithms. The function is defined by:

$$f(x, y) = (x^2 + y - 11)^2 + (x + y^2 - 7)^2.$$

It has one local maximum at $x = -0.270845$ and $y = -0.923039$ where $f(x, y) = 181.617$, and four identical local minima:

- $f(3.0, 2.0) = 0.0,$
- $f(-2.805118, 3.131312) = 0.0,$
- $f(-3.779310, -3.283186) = 0.0,$
- $f(3.584428, -1.848126) = 0.0.$

The locations of all the minima can be found analytically. However, because they are roots of cubic polynomials, when written in terms of radicals, the expressions are somewhat complicated.[citation needed]

The function is named after David Mautner Himmelblau (1924-2011), who introduced it. [1]
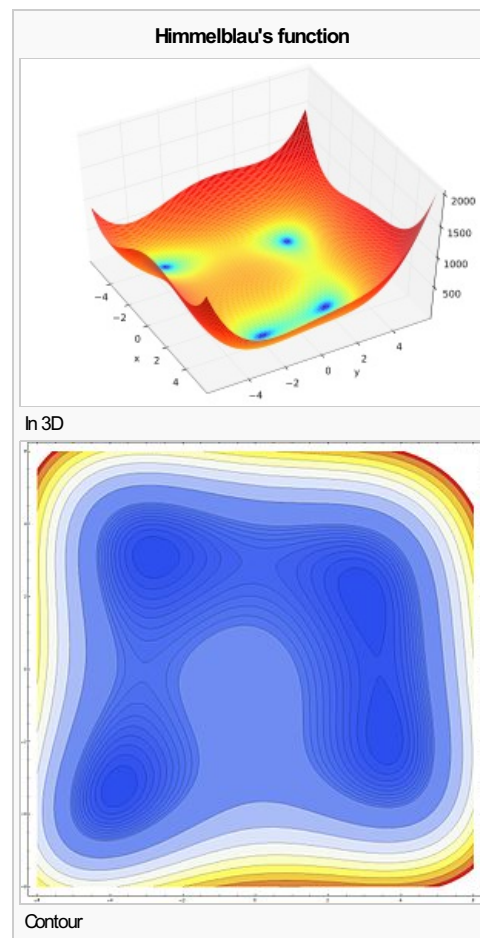
See also   [edit]

- Test functions for optimization

References   [edit]

1. ^ Himmelblau, D., *Applied Nonlinear Programming*. McGraw-Hill (1972) ISBN 0-07-028921-2

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