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A Study To Optimize Ore Evaluation At Western Deep Levels Gold Mine, Witwatersrand, By Using Geostatistics And Geological Subdivision

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The first set of control cards is read from file number 10. It controls the layout of the oreblocks and data area. The format used is:

columns	format	parameter
1 - 8	F8.2	X-coordinate of lower left corner of data area.
9 - 16	F8.2	Y-coordinate of lower left corner of data area.
17 - 24	F8.2	Angle by which grid is tilted against X,Y-coordinate system (counterclockwise)
25 - 32	F8.2	Oreblock size in X-direction.
33 - 40	F8.2	Oreblock size in Y-direction.
41 - 45	I5	Number of oreblocks to be estimated in X-direction.
46 - 50	I5	Number of oreblocks to be estimated in Y-direction.
71 - 75	F5.0	Size of data area, as multiple of the ore block size in X-direction. (e.g.if oreblock size is 100m, a parameter value of 3 results in a data area size of 300m).
76 - 80	F5.0	Size of data area, as multiple of the oreblock size in Y-direction.

The second control card of the first set gives the format of the input data.

The second set of control cards is read from file number 8. It controls the estimation itself. The first card contains the anisotropy factors of the semivariogram. The format is:

columns	format	parameter
1 - 10	F10.2	First structure, anisotropy factor in X-direction.
11 - 20	F10.2	First structure, anisotropy factor in Y-direction.
21 - 30	F10.2	Second structure, anisotropy factor in X-direction.
31 - 40	F10.2	Second structure, anisotropy factor in Y-direction.
41 - 50	F10.2	Third structure, anisotropy factor in X-direction.
51 - 60	F10.2	Third structure, anisotropy factor in Y-direction.

The format of the second card is:

columns	format	parameter
5	I1	If '1', a logtransformed semivariogram will be given, but backtransformed covariances shall be used in the estimation.
9 - 10	I2	Kriging method:'1' for simple kriging, '2' for ordinary kriging, '3' for universal kriging(linear trend), '4' for universalkriging (quadratic trend)
11 - 20	F10.2	Mean used for simple kriging.If '-99', a local mean,calculated as backtransformed lognormal mean of the data area, will be used.
21 - 22	I2	'0' for untransformed, '1' for logtransformed kriging
23 - 30	F8.2	Additive constant (if any).
31 - 32	I2	Number of semivariogram structures.
33 - 40	F8.2	Nugget effect (C0).

columns	format	parameter
41 - 45	F5.0	Range of first structure (A1)
46 - 53	F8.2	Sill of first structure (C1).
54 - 55	I2	Type of first structure: '0' for exponential, '1' for spherical, '2' for linear, '3' for de Wijsian, '4' for hole effect.
56 - 57	I2	Number of discretization points in X-direction.
5	I2	Number of discretization points in Y-direction.
60 - 63	I4	Max. number of samples to be used in kr.,ing (max. 128).
64 - 68	F4.1	Max. search radius.
69 - 70	I2	Type of output: '1' for parameters only, '2' for summary, '3' for debugging.
71 - 75	F5.0	Linear equivalent, if de Wijsian semivariogram is used.

If a nested semivariogram is used, the parameters of the second (and third....) structure is given on following cards in the adaequate columns.

A2.7 UKTREN - Program Description

This program is identical to UKSIM, except for simple kriging with a local mean. Instead of using a back-transformed mean of the data area as local mean, a trend surface is fitted to the samples of the data area. This trend is then extended to the oreblock, and its average value in an area of 300m by 300m centered at the oreblock, is used as local mean.

The subroutine for fitting the trend surface has been adapted from a program published by Davis, 1973. Upper and lower limits can be imposed on the local mean.

Only the first set of control cards differs from UK-SIM. Here the format of the first card is:

columns	format	parameter
1 - 8	F8.2	X-coordinate of lower left corner of data area.
9 - 16	F8.2	Y-coordinate of lower left corner of data area.
17 - 24	F8.2	Angle by which grid is tilted against X,Y-coordinate system (counterclockwise).
25 - 32	F8.2	Oreblock size in X-direction.
33 - 40	F8.2	Oreblock size in Y-direction.

column	format	parameter description
41 - 45	I5	Number of oreblocks to be estimated in X-direction.
46 - 50	I5	Number of oreblocks to be estimated in Y-direction.
64 - 65	I2	Order of trend: '1' for linear, '2' for quadratic, '3' for cubic.
71 - 75	F5.0	Size of data area, as multiple of the oreblock size in X-direction.
76 - 80	F5.0	Size of data area, as multiple of the oreblock size in Y-direction.

The second card contains the upper/lower limits for the local mean:

columns	format	parameter
1 - 10	F10.2	Lower limit.
11 - 20	F10.2	Upper limit.

The third card contains the format of the input data. All other specifications remain the same as in UKSIM.

The first set of control cards is read from file number 10. It controls the layout of the oreblocks and data area. The format used is:

columns	format	parameter
1 - 8	F8.2	X-coordinate of lower left corner of data area.
9 - 16	F8.2	Y-coordinate of lower left corner of data area.
17 - 24	F8.2	Angle by which grid is tilted against X,Y-coordinate system (counterclockwise)
25 - 32	F8.2	Oreblock size in X-direction.
33 - 40	F8.2	Oreblock size in Y-direction.
41 - 45	I5	Number of oreblocks to be estimated in X-direction.
46 - 50	I5	Number of oreblocks to be estimated in Y-direction.
71 - 75	F5.0	Size of data area, as multiple of the ore block size in X-direction. (e.g.if oreblock size is 100m, a parameter value of 3 results in a data area size of 300m).
76 - 80	F5.0	Size of data area, as multiple of the oreblock size in Y-direction.


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