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MATLAB9b

(Genetic Algorithm)

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Creating a Genetic Algorithm to Test the Optimum of the Standard Numbers

Abstract

The standard number is considered an important statistical tool to measure change quantity in economic phenomena through two different periods or places ; the first is named the basis period and the second is the comparison period (or basis place , comparison place) . The optimal standard number is that number which performs the two tests of chronological reflex in the basis and the reflex in the agent . In this research a genetic algorithm was created to test the standard numbers which were programmed by MATLAB9b language which saved a lot of time and efforts done annually to test the optimum of these numbers.

: (Introduction) - 1

Keywords : Standard Number ; Genetic Algorithm ; Statistics ;

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[2007
: (Aim of the Research) -2
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: (standard numbers) -3

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[2000,]
[2007 ,]
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(1)

V1	V0	2008 (qn)	2000 (q0)	2008 (Pn)	2000 (P0)	
58	30	8	6	7	5	
176	64	16	8	11	8	
48	8	12	4	4	2	
120	20	20	5	6	4	

168	63	14	7	12	9	
78	30	13	6	6	5	
648	215	83	36	46	33	

:

$$I_1 = \frac{\sum P_n}{\sum P_0} \times 100 = \frac{46}{33} \times 100 = 139.39$$

:

100

$$\frac{139.39}{100} = 1.39$$

2000

2008

:

$$I_2 = \frac{\sum P_0}{\sum P_n} \times 100 = \frac{33}{46} \times 100 = 71.739$$

:

100

$$\frac{71.739}{100} = 0.717$$

:

$$1.39 * 0.717 = 0.996$$

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,

:

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$$V = p * q$$

, **v1**

v0

:

=

*

(100

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$$139.39 =$$

:

$$I = \frac{\sum q_n}{\sum q_0} \times 100 = \frac{83}{36} \times 100 = 230.55$$

:

[142]

$$I = \frac{\sum V1}{\sum V0} \times 100 = \frac{648}{215} \times 100 = 301.395$$

: 100

1.3939 , 2.3055 , 3.0139

= *

$$3.0139 \neq 3.213 = 2.3055 * 1.3939$$

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(Fisher's Standard Number)

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:

.1

$$I_{A.F.I.I} = \sqrt{(I_{AL})(I_{AP})}$$

:

.2

$$I_{R.F.I.I} = \sqrt{(I_{RL})(I_{RR})}$$

:

$$I_{AL} = \frac{\sum P_n q_0}{\sum P_0 q_0} (100\%)$$

:

$$I_{RL} = \sum \frac{P_n}{P_0} q_0 (100\%)$$

$$I_{AP} = \frac{\sum P_n q_n}{\sum P_0 q_0} (100\%)$$

$$I_{RP} = \sum \frac{P_n}{P_0} q_n (100\%)$$

. [2004 ,

]

:(Genetic Algorithm)

-4

(GA)

(Crossover)

(Mutation)

.[Sivanaudom & Deepa ,2008]

Fitness)

(Objective function)

, (Value

(Selection)

. [Koza,2000]

-5

: -5
(Steps of the Create GA to test the optimum of the standard numbers)

(GA)

□

□

:(Initial Data)

.1

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: P0

: P1

: Q0

: Q1

: V0

. : V1
 : (Initial Generation) .2
 .
 : (Fitness Value) .3
 .
 (MATLAB)
 ,[Pascal&Michael,2009]
) (MATLAB9b) (GA)
 (
 .[Rutkowski & Scherer &etc.,2010]:
 : (Scattered Crossover) .
 (Mask) ,
 .
 : (Heuristic Crossover) .
 :
 Offspring 1 = Best Parent + r * (Best Parent – Worst Parent)
 Offspring 2 = Best Parent
 :
 . : r
 : (Gaussian Mutation) .
 ,
 .
 : (Stochastic Uniform Selection) .
 ,
 ,
 .
 : (Roulette Wheel Selection) .

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(2)

2007		2005		
99.99	107.18	101.50	7.185	
410	3.35	374	3.17	
7290	41.30	9117	38.30	
291	0.128	371	0.130	

$$\begin{pmatrix} \cdot \\ \cdot \end{pmatrix} \left(\begin{array}{cc} & \\ & \end{array} , \begin{array}{cc} & \\ & \end{array} \right)$$

(Stochastic Uniform)

(0.8) (Scattered)

(Gaussian)

(20)

(75)

$$: \quad (51)$$
$$132.9127 =$$
$$81.2062 =$$

[146]

87.5588 =

74.6588 =

. 121.2674 = ,

.2

[2007 ,]: (3) 1988 1984

(3)

()		()		
1988 Qn	1984 q0	1988 Pn	1984 P0	
100	9	9.5	4.8	
5	3	5.1	2.7	
12	10	6.8	3.6	

: (, ,)

(Roulette)

(0.8) (Heuristic)

(Gaussian)

(20)

: (75) (1000)

192.792 =

521.818 =

1.2109 =

51.869 =

. 787.06873 =
,
2005 () ()
[2009 ,] : (4) , 2008

(4)

2008		2005		
qn	Pn	q0	P0	
200	4000	150	3400	A
350	4600	280	3900	B
275	5800	400	4900	C

: (, ,)
(Remainder)
(0.8) (Heuristic)
(Gaussian)
(20)
: (65) (750)
118.0328 =
99.3975 =
1.12436 =
84.722 =
. 121.00944 =

:(Conclusions) -7
(GA) .1
)

- ، (.
2.) (GA) , 0.8 , (.
3. () (GA) .

-8 : (Recommendations)

: (References)

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