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Inteligencia Artificial 1

Escuela de Vacaciones diciembre 2021

Tarea

**Algoritmos genéticos**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **MINIMIZA F(X)=𝑥^2** | |  | |  | |  | |  | |  | |  | |
| **Generacion1** | |  | |  | |  | |  | |  | |  | |  | |
|  | | x | | fitness | |  | |  | |  | | x | | fitness | |
| 01100 | | 12 | | **144** | | MP | | Hijo1 | | 01101 | | 13 | | 169 | |
| 11001 | | 25 | | 625 | |  | | Hijo2 | | 00100 | | 4 | | 16 | |
| 00101 | | 5 | | **25** | | MP | |  | |  | |  | |  | |
| 10011 | | 19 | | 361 | |  | | mutado-1 | | 10010 | | 18 | | 324 | |
|  | |  | | **1155** | |  | | mutado-2 | | 11011 | | 27 | | 729 | |
|  | |  | |  | |  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |  | |  | |  | |
| **Generacion2** | |  | |  | |  | |  | |  | |  | | |  | | --- | |  | | |
|  | | x | | fitness | |  | |  | |  | | x | | fitness | |
| 00101 | | 5 | | 25 | |  | | Hijo1 | | 00100 | | 4 | | 16 | |
| 00100 | | 4 | | **16** | | MP | | Hijo2 | | 00100 | | 12 | | 144 | |
| 01100 | | 12 | | **144** | | MP | |  | |  | |  | |  | |
| 01101 | | 13 | | 169 | |  | | mutado-1 | | 11011 | | 27 | | 729 | |
|  | |  | | **354** | |  | | mutado-2 | | 10011 | | 19 | | 361 | |
|  | |  | |  | |  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |  | |  | |  | |
| convergencia | | 0.306493506 | |  | |  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |  | |  | |  | |
| **Generacion3** | |  | |  | |  | |  | |  | |  | |  | |
|  | | x | | fitness | |  | |  | |  | |  | |  | |
| 00100 | | 4 | | 16 | |  | |  | |  | |  | |  | |
| 00100 | | 4 | | 16 | |  | |  | |  | |  | |  | |
| 01100 | | 12 | | 144 | |  | |  | |  | |  | |  | |
| 01100 | | 12 | | 144 | |  | |  | |  | |  | |  | |
|  | |  | | **320** | |  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |  | |  | |  | |
|  | |  | |  | |  | |  | |  | |  | |  | |
| convergencia | | **0.903954802** | |  | |  | |  | |  | |  | |  | |
|  | | **Con la tercera generación se consigue la convergencia de 90%** | | | |  | |  | |  | |  | |  | |
|  | |  | | | |  | |  | |  | |  | |  | |
| **Minimizar F(X)=((A-B)+(2C-D)+5)** | | | | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
| Generacion1 | | |  | |  | |  | |  | |  | |  | |  | |
|  | a | | b | | c | | d | | F(X) | |  | |  | |  | |
| 1 | 24 | | 10 | | 50 | | 5 | | 114 | |  | |  | |  | |
| 2 | 0 | | 90 | | 25 | | 33 | | **-68** | | MP | | Hijo-1 | | 00212560 | |
| 3 | 90 | | 35 | | 20 | | 80 | | 20 | |  | | Hijo-2 | | 35901133 | |
| 4 | 35 | | 21 | | 11 | | 60 | | **-19** | | MP | |  | |  | |
|  |  | |  | |  | |  | | 47 | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
| Generacion2 | | |  | |  | |  | |  | |  | |  | |  | |
|  | a | | b | | c | | d | | F(X) | |  | |  | |  | |
| 1 | 0 | | 90 | | 25 | | 33 | | **-68** | | MP | |  | |  | |
| 2 | 0 | | 21 | | 25 | | 60 | | -26 | |  | | Hijo-1 | | 00902533 | |
| 3 | 35 | | 21 | | 11 | | 60 | | -19 | |  | | Hijo-2 | | 35901133 | |
| 4 | 35 | | 90 | | 11 | | 33 | | **-61** | | MP | |  | |  | |
|  |  | |  | |  | |  | | -174 | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  | convergencia | | -0.27011494 | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
| Generacion3 | | |  | |  | |  | |  | |  | |  | |  | |
|  | a | | b | | c | | d | | F(X) | |  | |  | |  | |
| 1 | 0 | | 90 | | 25 | | 33 | | **-68** | | MP | |  | |  | |
| 2 | 35 | | 90 | | 11 | | 33 | | -61 | |  | | Hijo-1 | | 00902533 | |
| 3 | 35 | | 90 | | 11 | | 33 | | -61 | |  | | Hijo-2 | | 00902533 | |
| 4 | 0 | | 90 | | 25 | | 33 | | **-68** | | MP | |  | |  | |
|  |  | |  | |  | |  | | -258 | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  | convergencia | | 0.6744186 | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
| Generacion4 | | |  | |  | |  | |  | |  | |  | |  | |
|  | a | | b | | c | | d | | F(X) | |  | |  | |  | |
| 1 | 0 | | 90 | | 25 | | 33 | | -68 | |  | |  | |  | |
| 2 | 0 | | 90 | | 25 | | 33 | | -68 | |  | |  | |  | |
| 3 | 0 | | 90 | | 25 | | 33 | | -68 | |  | |  | |  | |
| 4 | 0 | | 90 | | 25 | | 33 | | -68 | |  | |  | |  | |
|  |  | |  | |  | |  | | -272 | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  | convergencia | | 0.94852941 | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  |  | |  | |  | |  | |  | |  | |  | |  | |
|  |  | | con la cuarta generacion ser obtiene una convergencia de 95% | | | | | | | | | |  | |  | |