

E07 - ANN

Vinicius Gasparini

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1 Diferenças divididas de Newton - Implementação

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import numpy as np
from numpy import linalg
from pprint import pprint

Xi = np.array([i/10 for i in range(-50, 55, 5)])
Yi = np.array([-1.82, -1.44, -0.99, -4.09, -4.49,
               -0.28, -3.37, 3.23, -2.93, 0.68,
               -2.12, -3.54, 0.74, -0.21, -0.91,
               -2.3, 0.19, 0.52, -1.76, 0.98, 2.07])

grau = len(Xi)

ans = [[0 for j in range(grau)] for i in range(grau)]

# Preenchendo primeira coluna
for i in range(grau):
    ans[i][0] = Yi[i]

for i in range(1, grau):
    for j in range(1, i+1):
        ans[i][j] = (ans[i][j-1] - ans[i-1][j-1]) / (Xi[i] - Xi[i-j])

for i in range(grau):
    print
    print("a_{{{}}}={:.15f}".format(i, ans[i][i]))
```

2 Resposta

$a_0 = -1.820000000000000$
 $a_1 = 0.760000000000000$
 $a_2 = 0.140000000000000$
 $a_3 = -4.826666666666666$
 $a_4 = 6.579999999999999$
 $a_5 = -3.789333333333333$
 $a_6 = 0.420444444444444$
 $a_7 = 1.205587301587302$
 $a_8 = -1.337968253968254$
 $a_9 = 0.899908289241623$
 $a_{10} = -0.465489947089947$
 $a_{11} = 0.199141382074715$
 $a_{12} = -0.072851777029555$
 $a_{13} = 0.023211224989003$
 $a_{14} = -0.006511391959011$
 $a_{15} = 0.001618960369437$
 $a_{16} = -0.000358033344277$
 $a_{17} = 0.000070461775087$
 $a_{18} = -0.000012292379971$
 $a_{19} = 0.000001877817391$
 $a_{20} = -0.000000243285917$