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#include <stdio.h>

void neville() {

int i, j;

int n = 4;

double X;

double x[n];

double y[n];

double Q[n][n];

for (i = 0; i < n; i++) {

for (j = 0; j < n; j++) {

Q[i][j] = 0.0;

}

}

x[0] = 8.1;

x[1] = 8.3;

x[2] = 8.6;

x[3] = 8.7;

y[0] = 16.94410;

y[1] = 17.56492;

y[2] = 18.50515;

y[3] = 18.82091;

X = 8.4;

for (i = 0; i < n; i++) {

Q[i][0] = y[i];

}

for (i = 1; i < n; i++) {

for (j = 1; j <= i; j++) {

Q[i][j] = ((X - x[i-j]) \* (Q[i][j-1]) - (X - x[i]) \* ( Q[i-1][j-1])) / (x[i] - x[i -j]);

}

}

printf("Q matrix: \n");

for (i = 0; i < n; i++) {

for (j = 0; j <n; j++) {

printf("%9f ", Q[i][j]);

}

printf("\n");

}

}

int main() {

neville();

}

1a.

Q matrix:

16.944100 0.000000 0.000000 0.000000

17.564920 17.875330 0.000000 0.000000

18.505150 17.878330 17.877130 0.000000

18.820910 17.873630 17.877155 17.877143

1b. (Substituted numbers in the code above)

Q matrix:

-0.071813 0.000000 0.000000 0.000000

-0.024750 0.069375 0.000000 0.000000

0.334937 0.694625 1.007250 0.000000

1.101000 1.101000 1.101000 1.101000