When using numerical approximation techniques, it is useful to have programs written to aid in numerical calculations to avoid calculations by hand. Using Matlab, create an

M-file named "divdifftable.m" which will contain Matlab code that implements the algorithm to create a divided difference table corresponding to a set of data points.

Inside this file, write the code to implement the method. One example of a correctly executable routine based on the algorithm description in the text is as follows:

```
function rtn = divdifftable(x,f)

%given an input vector x of x data values

%and an input vector f of f data values,

%the divided difference table d is generated

%and outputed

n = length(x);

%a(1) = y(1);

for k = 1 : n - 1

d(k, 1) = (f(k+1) - f(k))/(x(k+1) - x(k));

end

for j = 2 : n - 1

for k = 1 : n - j

d(k, j) = (d(k+1, j - 1) - d(k, j - 1))/(x(k+j) - x(k));

end

end

d(n,:)=0;

d=[x' f' d];

d

end
```

To construct the divided difference table for the given data values, make use of the following Matlab commands

INPUT:

>> x=[-0.2,0.3,0.7,-0.3,0.1];

>> f=[1.23,2.34,-1.05,6.51,-0.06];

>> divdifftable(x,f)

OUTPUT:

d =

-0.2000 1.2300 2.2200 -11.8833 -103.5833 73.6111

0.3000 2.3400 -8.4750 -1.5250 -81.5000 0

0.7000 -1.0500 -7.5600 14.7750 0 0

-0.3000 6.5100 -16.4250 0 0 0

0.1000 -0.0600 0 0 0 0