Scientific Visualization I

Assignment 7

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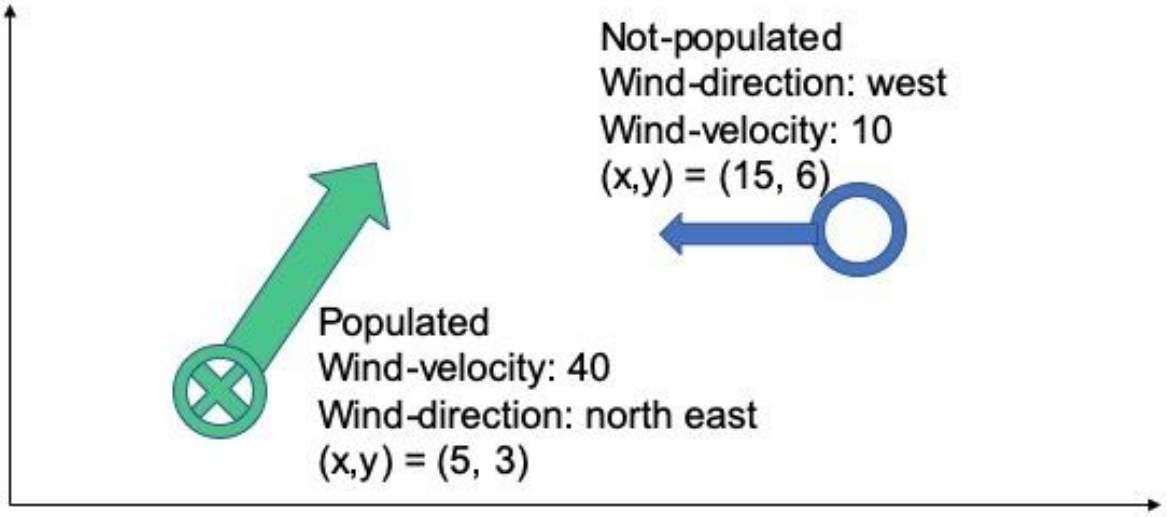
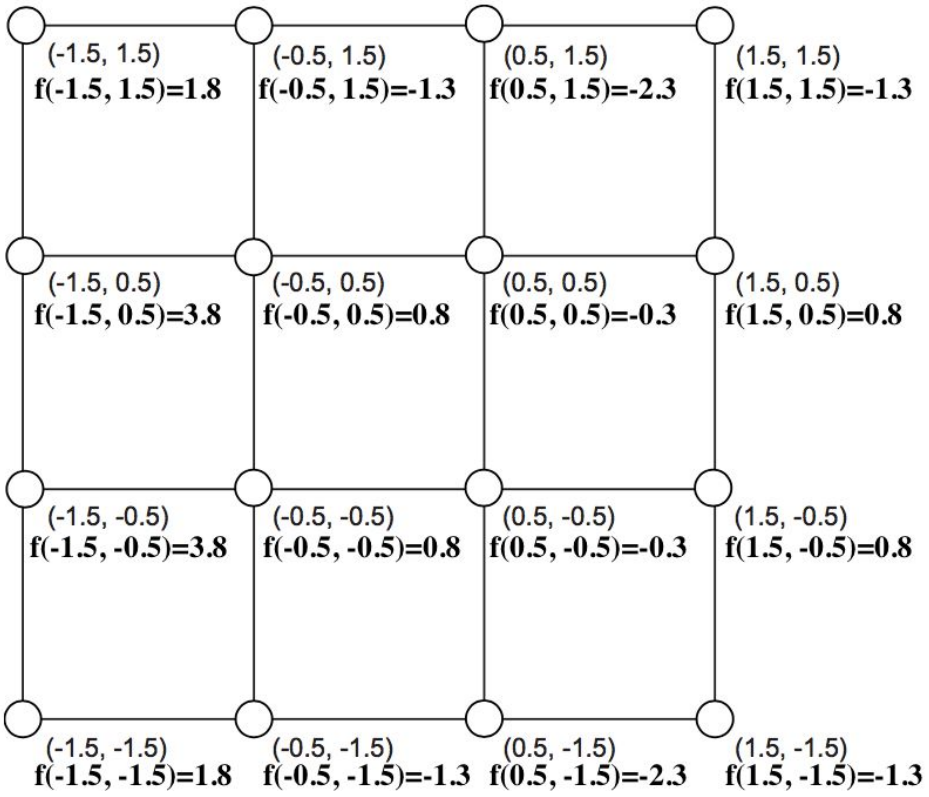
Exercise 7.1

Attribute	Variable: Dimension	Description
latitude	spatial position of y: 1	
longitude	spatial position of x: 1	
atmospheric pressure	color of Green component: 1	value of green component is portotional to that of pressure
wind direction on the ground	arrow direction: 2 (x-y direction)	direction of arrow is the same as wind dirction
wind velocity	arrow size: 1	size of arrow is portotional to that of wind velocity
humidity	color of Blue component: 1	value of blue component is portotional to that of humidity
whether the location is populated	shape: 1	Round is not populated X-sign is populated
temperature	color of Red component: 1	value of red component is portotional to that of temperature

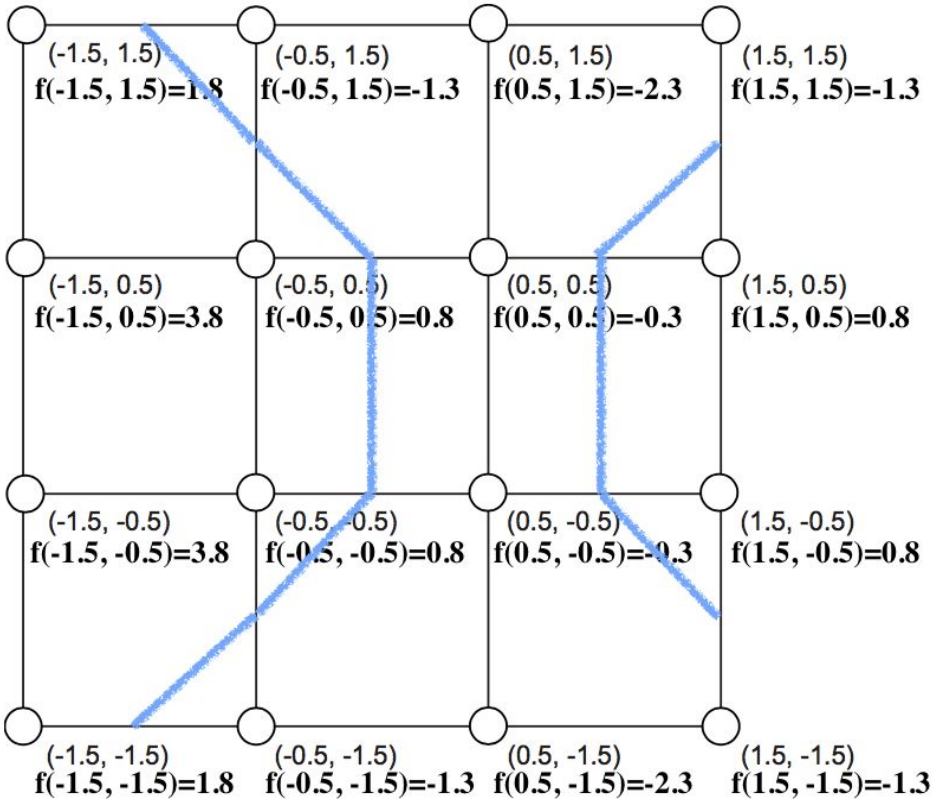


Exercise 7.2

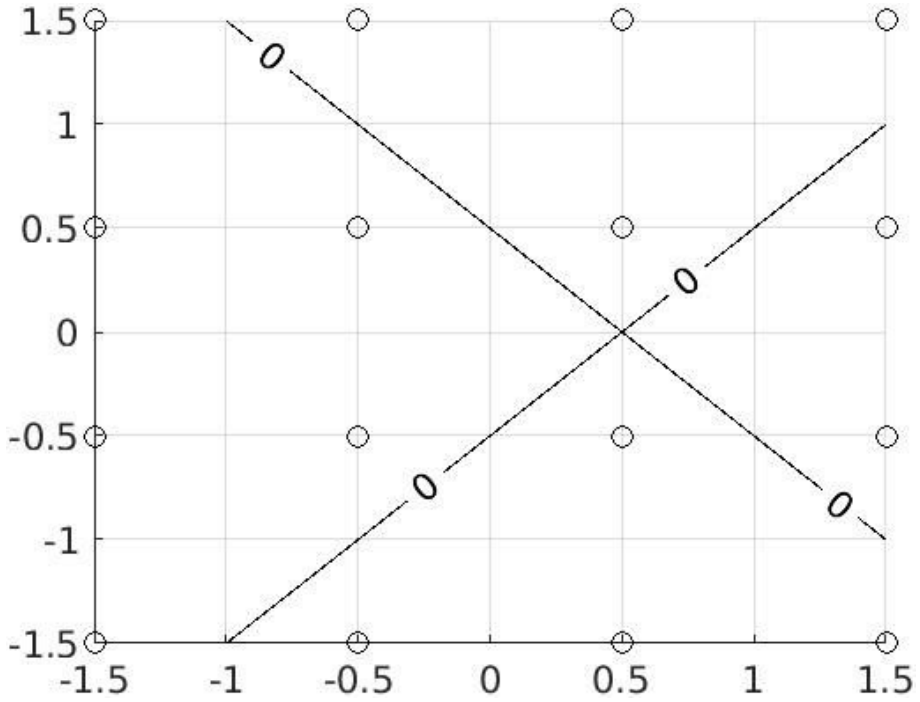
1.



2. (a)



2.(b)



Compared to the approximated solution, the difference is that there's an intersection at point (0.5, 0). there are issue also from linear interpolation

3.

The Marching Squares algorithm is suitable for parallelization since the grids can be divided into multiple squares and each square can be processed independently. According to the values on the nodes, the isoline in each square can be calculated by linear interpolation simultaneously. Finally, merging all the squares and we can get complete isolines.