

CSE 377/CSE 594 - Homework 2

Fall 2007

Due Thursday, Oct 4 in class

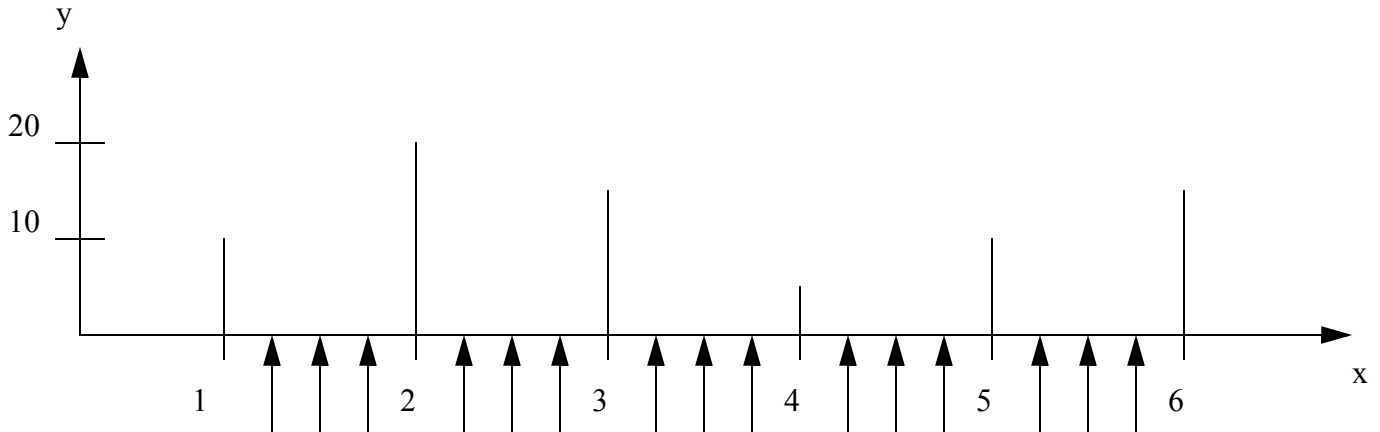
1. Interpolation (1D):

Estimate the values of the points indicated by arrows using

a) nearest neighbor interpolation (assume $x=0.5$ behaves like $x=0.4999$)

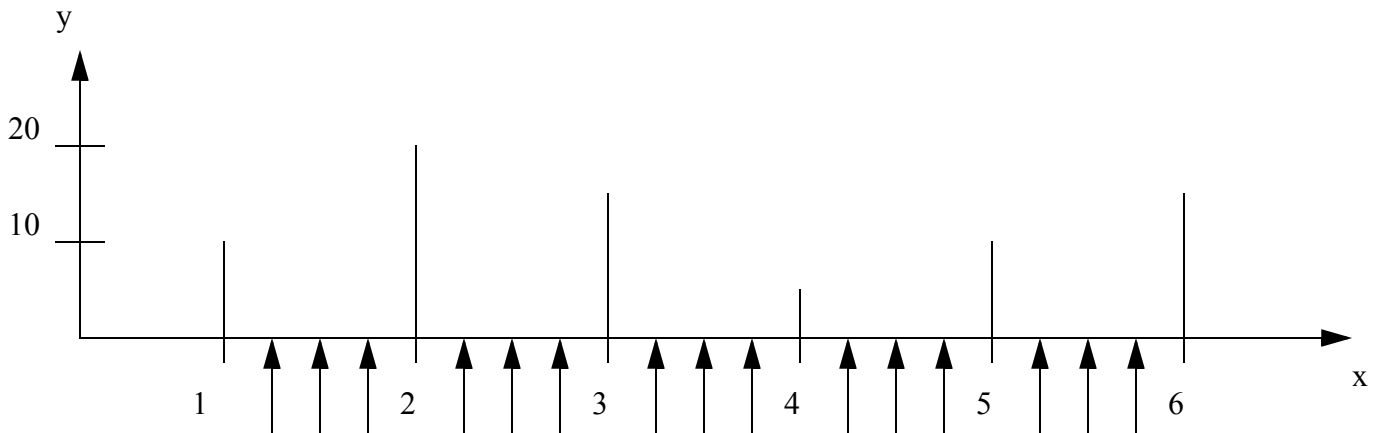
b) linear interpolation

(Note, the height of the bars is in quarters of the unit length of the grid).



c) What can you say about other points in this interval for each of the two filters. What is the shape of the curve they fall on? Draw each curve into the figure.

d) You learned in class that this is like convolution with a box/tent filter. So now double the size of the box/tent filter and estimate the values (find the curve) again. make sure you do a proper scaling of the filter. What do you observe? The figure is drawn below again for convenience.

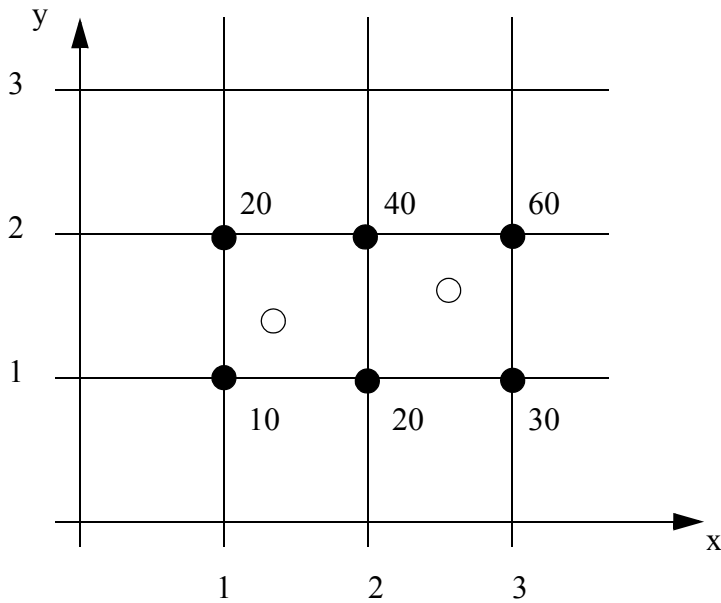


(see next page for #2)

2. Interpolation (2D):

From the grid values given next to the full circles, estimate the values of the points indicated by the the two hollow circles with coordinates $(x,y) = (1.3, 1.2)$ and $(x,y) = (2.8, 1.7)$ using

- nearest neighbor interpolation
- bilinear interpolation



c) What can you say about other points in these two squares, for each of the two filters. What is the shape of each surface they they fall on? Sketch here as a 3D plot (a surface).