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###############################################################################
############################# CS461 - Homework 5 ##############################
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## Group name : puzzle blusters
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## Programming language : Python2.7
## After execuing this program you will get trace of two examples ;
      # one : for the original set of data points ( without the additional
unknown data point (1,4) ).
      # two : for the set of data points + additional unknown data point (1,4).

 and for each example you will get the result of each element of the given list
of the query points with a trace of the program's calculation for each query
(which parts of the decision tree of figure 19.7 the program is visiting until
it finds the answer.
```

Here a screen shot of the results :

```
########################### original set of points #########################

******* unknown is : (1, 4) *********
trace : point height  >  3.5 : YES
trace : point width   <  3.5 : NO
trace : point height  <  5.5 : NO
nearest_neighbor is : (2, 5)
color is : Orange

******* unknown is : (1, 1) *********
trace : point height  <  3.5 : NO
trace : point width   <  3.0 : NO
trace : point height  <  1.5 : NO
nearest_neighbor is : (2, 1)
color is : Violet

******* unknown is : (6, 6) *********
trace : point height  >  3.5 : YES
trace : point width   >  3.5 : YES
trace : point height  >  5.5 : YES
nearest_neighbor is : (5, 6)
color is : Yellow

******* unknown is : (6, 1) *********
trace : point height  <  3.5 : NO
trace : point width   >  3.0 : YES
trace : point height  <  1.5 : NO
nearest_neighbor is : (6, 1)
color is : Green

******* unknown is : (4, 4) *********
trace : point height  >  3.5 : YES
trace : point width   >  3.5 : YES
trace : point height  <  5.5 : NO
nearest_neighbor is : (6, 5)
color is : Purple
```

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########## set of points with addition of unknown point (1, 4) ##########

******* unknown is : (1, 4) *********
trace : point height  >  3.0 : YES
trace : point width   <  2.0 : NO
trace : point height  <  4.5 : NO
nearest_neighbor is : (1, 4)
color is : Orange

******* unknown is : (1, 1) *********
trace : point height  <  3.0 : NO
trace : point width   <  3.0 : NO
trace : point height  <  1.5 : NO
nearest_neighbor is : (2, 1)
color is : Violet

******* unknown is : (6, 6) *********
trace : point height  >  3.0 : YES
trace : point width   >  2.0 : YES
trace : point height  >  5.5 : YES
trace : point width   >  3.5 : YES
nearest_neighbor is : (5, 6)
color is : Yellow

******* unknown is : (6, 1) *********
trace : point height  <  3.0 : NO
trace : point width   >  3.0 : YES
trace : point height  <  1.5 : NO
nearest_neighbor is : (6, 1)
color is : Green

******* unknown is : (4, 4) *********
trace : point height  >  3.0 : YES
trace : point width   >  2.0 : YES
trace : point height  <  5.5 : NO
nearest_neighbor is : (6, 5)
color is : Purple
```