Shashank Karthikeyan
A50703012

CSE 201 Homework 9

1. Chapter 6 focuses on pattern recognition. The first method of pattern recognition is called the nearest neighbor trick. The example used was determining the political affiliation of someone based on their home address. This was done by looking the person's nearest neighbors and associating their political affiliation based on what most the neighbors are affiliated with. The next method of patter recognition discussed in the chapter was the twenty-one questions trick which used a series of yes/no questions to form a decision tree for a certain question. The next method was neural networks which mimic the workings of the human brain to solve a question.

2.

    a. 100 buckets (0-99)

    b.

        i. $2237^2 = 5004169 \rightarrow 04$

        ii. $1697^2 = 2879809 \rightarrow 79$

        iii. $9832^2 = 96668224 \rightarrow 68$

    c. 1000 and 2000

    d. $2015^2 = 4060225 \rightarrow$ bucket 60

3. $f(x) = x^2-27$ $f'(x) = 2x$ target = sqrt(27) = 5.19

n	x_n	$f(x_n)$	$f'(x_n)$	x_{n+1}
0	7	22	14	5.429
1	5.429	2.469	10.857	5.201
2	5.201	0.052	10.402	**5.196**

4.

Element	1	2	3	4	5	6	7	8
Data	38	72	21	65	58	70	2	90
1st Pass	38	21	65	58	70	2	72	90
2nd Pass	21	38	58	65	2	70	72	90
3rd Pass	21	38	58	2	65	70	72	90
4th Pass	21	38	2	58	65	70	72	90
5th Pass	21	2	38	58	65	70	72	90
6th Pass	2	21	38	58	65	70	72	90

5.

Element	1	2	3	4	5	6	7	8							
Data	38	72	21	65	58	70	2	90							
Divide 2	37	72	21	65		58	70	2	90						
Divide 4	37	72		21	65		58	70		2	90				
Divide 8	37		72		21		65		58		70		2		90
Merge 2	37	72		21	65		58	70		2	90				
Merge 4	21	37	65	72			2	58	70	90					
Merge 8	2	21	37	58	65	70	72	90							