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.
   1. 100 buckets (0-99)
      1. 22372 = 5004169 🡪 04
      2. 16972 = 2879809 🡪 79
      3. 98322 = 96668224 🡪 68
   2. 1000 and 2000
   3. 20152 = 4060225 🡪 bucket 60
2. f(x) = x2-27 f’(x) = 2x target = sqrt(27) = 5.19

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| --- | --- | --- | --- | --- |
| n | xn | f(xn) | f’(xn) | xn+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** |

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| **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 |

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| **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 |  |  |  |  |  |  |  |