Erik Kellgren

Homework 1

1.1

1. BECAUSE THE PRACTICE OF THE BASIC MOVEMENTS OF KATA IS THE FOCUS AND MASTERY OF SELF IS THE ESSENCE OF MATSUBAYASHI RYU KARATE DO I SHALL TRY TO ELUCIDATE THE MOVEMENTS OF THE KATA ACCORDING TO MY INTERPRETATION BASED ON FORTY YEARS OF STUDY

IT IS NOT AN EASY TASK TO EXPLAIN EACH MOVEMENT AND ITS SIGNIFICANCE AND SOME MUST REMAIN UNEXPLAINED TO GIVE A COMPLETE EXPLANATION ONE WOULD HAVE TO BE QUALIFIED AND INSPIRED TO SUCH AN EXTENT THAT HE COULD REACH THE STATE OF ENLIGHTENED MIND CAPABLE OF RECOGNIZING SOUNDLESS SOUND AND SHAPELESS SHAPE I DO NOT DEEM MYSELF THE FINAL AUTHORITY BUT MY EXPERIENCE WITH KATA HAS LEFT NO DOUBT THAT THE FOLLOWING IS THE PROPER APPLICATION AND INTERPRETATION I OFFER MY THEORIES IN THE HOPE THAT THE ESSENCE OF OKINAWAN KARATE WILL REMAIN INTACT

r = E, b = T, m = A, i = S, j = O, p = H, u = R, v = C, w = I, x = F, d = D, l = B, o = G, h = L, q = K, y = M, k = N, s = P, f = Q, n = U, e = V, c = W, a = X, t = y, g = z

1. Shoshin Nagamine

1.2

1. IFWEALLUNITEWEWILLCAUSETHERIVERSTOSTAINTHEGREATWATERSWITHTHEIRBLOOD.

2. Tecumseh

1.3

1. Each machine costs $100, we have $1,000,000. Therefore, we can purchase 10,000 machines. Each of our machines checks 5 x 108 keys/second times our 10,000 machines (104). So, 5 x 108 x 104 = 5 x 1012 keys/second.

On average the correct key will be found halfway through, so searching key space 2128, average case will be 2127. 2127/5 x 1012 keys/second is about = 3.4 x 1025 seconds which comes out to 1.08 x 1018 years. This is approximately 108 times longer than the age of the universe.

2. i represents Moore’s law, 1.08 x 1018 years x 365/2i = 1 day

rearrange, 2i = 1.08 x 1018 years x 365 days, i = roughly 68.42 (round to 69)

1.5 years x 69 iterations = 103.5 years

1.4

1. 1288 = 256 = 7.205 x 1016

2. There are 256 possible passwords, therefore the key length is 56

3. The password is restricted to lower case letters, therefore the number of possible characters is reduced from 127 to 26. The number of possible 8-letter passwords is 268 = 208827064576. log2 208827064576 is about 37.6035177451 bits.

4. 128i = 27i = 2128 simplify to 7i = 128. i = 128/7. i is about 18.285 ASCII characters.

4b. 26i = 2128. i = log26 2128. i is about 27.231 lower case letters.

1.5

1. 15 x 29 mod 13 = 2 x 3 mod 13 = 6 mod 13

2. 2 x 29 mod 13 = 2 x 3 mod 13 = 6 mod 13

3. 2x 3 mod 13 = 6 mod 13

4. -11 x 3 mod 13 = 2 x 3 mod 13 = 6 mod 13

1.10

m = 4. o(4) is 2

1, 3

m = 5. o(5) is 4

1, 2, 3, 4

m = 9. o(9) is 6

1, 2, 4, 5, 7, 8

m = 26. o(12) is 9

1, 3, 5, 7, 9, 11, 15, 17, 19, 21, 23, 25