



Meeting Report

Meeting Number: **0001**
Date of meeting: 2007.01.12
Duration: 4pm - 10pm
Author: The Pi Square's

Summary:

This meeting was the first meeting of the Pi Squares. We determined a name for the group and agreed on meeting days. We also explored two types of algorithms, educated guess algorithm and linear search algorithm. Along with analyzing some possible directions for next algorithms.

Algorithm's:

Educated Guess Algorithm:

-We tried to design an algorithm such that it would randomly try two proposed factors near the square root and then judging by the separation distance of the product of the two primes and the number we would like to factor randomly adjust the proposed factors within some constraints to create two new proposed factors which would have a product closer to the number we wish to factor.

-Advantages:

Algorithm is based on randomness and is similar to playing a really extravagant lottery, but we can play many many times per second

-Disadvantages:

Could not find a way to constrain the new proposed factors depending on the distance separation of the original product of the proposed factors and the number we wish to factor

Linear Search Algorithm:

-It is known that at least one integer factor (if it exists) of a number must be less than the floor of the square root of the number. By dividing the number we wish to factor by this number and checking if the quotient is a natural number we are guaranteed to find a factor.

1) $C = \text{Number to factor}$

2) $A = \text{floor}(\sqrt{C})$

3) $B = C/A$

4) while B not in Natural Numbers and $A > 0$:

4.a) $A = A - 1$

4.b) $B = C/A$

5) if $A > 0$:

5.a) print "Found Factor: ", B

-Advantages:

-Algorithm always terminates, if a factor exists we are sure to find it using this algorithm

-Disadvantages:

-For every extra digit there are 10 times the number of computations involving steps that divide these large numbers, so growth rate in worst case time grows exponentially with respect to length of number to factor.

Proposed Ideas:

Towards the end of the meeting we were lucky enough to be enlightened by one of our

Proposed Ideas:

members to the world of Neural Networks. We think that this may be a very worthwhile avenue to test out. Possibly by creating a ANN (Artificial Neural Network) on a computer system we may be able to train it to recognize prime numbers with some probability >0 . Or possibly train it with something else which would be beneficial to us.

To Research:

Neural Networks

Wiki: [Neural Networks](#)

Wiki: [Artificial Neural Networks](#)

Genetic Algorithm:

Wiki: [Genetic Algorithm](#)