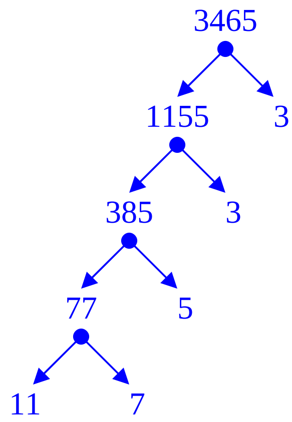
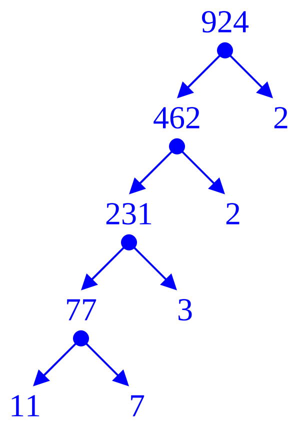
CSCI 1900 – Tarnoff
May 24, 2005 Homework Answers

- Write the decimal value 3465 as a product of powers of primes



$3{,}465 = 3^2 \cdot 5 \cdot 7 \cdot 11$

- Write the decimal value 924 as a product of powers of primes



$924 = 2^2 \cdot 3 \cdot 7 \cdot 11$

- Determine GCD(3465, 924) and LCM(3465, 924)

First, the GCD of 3465 and 924 could be found simply by multiplying the minimum of each power of each prime from the answers above. This would give us:

$\text{GCD}(3465, 924) = 3 \cdot 7 \cdot 11 = 231$

The Euclidian Algorithm could also be used:

$3465 = \underline{\ 3\ } \cdot 924 + \underline{\ 693}$

$924 = \underline{\ 1\ } \cdot 693 + \underline{\ 231}$

$693 = \underline{\ 3\ } \cdot 231 + \underline{\ 0}$

With 231 dividing 693, then GCD(3465, 924) = 231.

The LCM of 3465 and 924 can also be found two different ways. First, it can be calculated by multiplying the maximum of each power of each prime from the answers above. This would give us:

$\text{LCM}(3465, 924) = 2^2 \cdot 3^2 \cdot 5 \cdot 7 \cdot 11 = 13{,}860$

The LCM of 3465 and 924 can also be calculated by multiplying 3465 and 924 and dividing it by their GCD.

$\text{LCM}(3465, 924) = (3465 \cdot 924)/231 = 13{,}860$

- Write the base 10 expansion of 341_5

Remember that each place in any base representation is simply a subsequent power of that base. For example, the 1 in 341_5 is in the 5^0 position, the 4 is in the 5^1 position, and the 3 is in the 5^2 position. Adding these values gives us:

$341_5 = 3 \cdot 5^2 + 4 \cdot 5^1 + 1 \cdot 5^0 = 3 \cdot 25 + 4 \cdot 5 + 1 \cdot 1 = 96_{10}$

- Write the base 5 expansion of 772_{10}

Each time we divide a base 10 value by an integer, the remainder is the next digit for that base. For example, if we divide 772_{10} by 5, that gives us the least significant digit of the base 5 value. Dividing the result of $772_{10} \div 5$ by 5 again gives us the next digit and so on.

$772 \div 5 = 154$	remainder 2
$154 \div 5 = 30$	remainder 4
$30 \div 5 = 6$	remainder 0
$6 \div 5 = 1$	remainder 1
$1 \div 5 = 0$	remainder 1

Listing the values in reverse order from that which they were generated gives us:

$772_{10} = 11042_5$