**מטלה 0 מבוא לחישוב**

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1. Explanation for the algorithm

The algorithm gets 2 natural numbers and finds the greatest prime common divisor. The algorithm works by finding the GCD of the numbers, then finding the prime divisors of that GCD, and printing the largest of the prime divisors.

1. Pseudo Code
   1. Input(a>1) //assuming a is a natural number a>0
   2. Input(b>1) //assuming b is a natural number b>0
   3. gcd //gcd is the value representing the greatest common divisor
   4. for(i=1; i<=a and i<=b; i++){ //loop over all numbers that are between 1 and the lowest of a or b
   5. if(a%i==0 and b%i==0){ //if both numbers can divide by I, it is a common divisor
   6. gcd = I //change the value of gcd to the current i
   7. }//if //the end of the “if” block
   8. }//for //the end of the “for” block, here the highest common divisor is in gcd
   9. Primes (List) //create a list and call it primes that will represt all the primes that gcd is divided by
   10. While(gcd%2 == 0){ //loop over until gcd is an odd number
   11. Primes.append(2) //append the number 2 to the end of the Primes list
   12. gcd /= 2 //Divide gcd by 2 until it does not divide by 2 natively
   13. }//while //the end of the “while” block
   14. For(i=3; i<=sqrt(gcd); i+=2){ //loop over all the numbers that are between 3 and the square root of gcd
   15. While(gcd%i == 0){ //loop over gcd until it does not divide by I natively
   16. Primes.append(i) //append I (the prime number) into Primes
   17. gcd = gcd/I //divide gcd by the prime number that was appended
   18. }//while //end of “while” block
   19. }//for //end of “for” block
   20. If(n>2){ //if the last number (gcd) that is left is higher than 2
   21. Primes.append(gcd) // append gcd to Primes
   22. }//if //end of “if” block
   23. GPCD = Primes[0] //put into GPCD
   24. For(i=1; i<Primes.Length; i++){ //loop over the length of Primes list
   25. If(Primes[i] > GPCD){ //if the prime number in i spot in the list is bigger than current GPCD
   26. GPCD = Primes[i] //put the prime number as the current GPCD
   27. }//if //end of “if” block
   28. }//for //end of “for” block
   29. Print(GPCD) //print the greatest prime common divisor of a and b