**Algorithm: Convert an Integer from Base 10 to Any Other Base**

**Input:**

 two positive integers, base b and number n in base 10

**Output:**

 the value of n in base b

**Procedure:**

 i = 0

di = n mod b

q = n / b

while ( q $\ne $ 0 )

 i = i+1

 di = q mod b

 q = n/b

The number n in base b is obtained by assembling the digits from left to right in reverse order that they were calculated.

**Example**:

Suppose we want to convert 482 to base 5

482 = 96\*5 + 2 ; remainder (2) is d0 digit; quotient is 96 (not zero) so we continue

96 = 19\*5 + 1 ; remainder (1) is d1 digit; quotient is 19 (not zero) so we continue

19 = 3\*5 + 4 ; remainder (4) is d2 digit; quotient is 3 (not zero) so we continue

3 = 0\*5 + 3 ; remainder (3) is d3 digit; quotient is zero so we stop

Assembling the digits, we see that 48210 = 34125

**Algorithm: Convert an Integer From Base b to Base 10**

**Input:**

 two positive integers, base b and number n in base b

**Output:**

 the value of n in base b

**Procedure:**

 The number n in base b is converted to base 10 by writing the number n in expanded form and evaluating

**Example**:

Suppose we want to convert 34125 to base 10

$$3\*5^{3} + 4\*5^{2} + 1\* 5^{1} + 2\*5^{0} = $$

$$3\*125 +4\*25 + 1\*5 + 2\*1 =$$

$$375 + 100 + 5 + 2 =$$

$$482$$

Therefore, 34125 = 48210