ALGORITHM: DECIMAL D $\rightarrow$ 8-BIT BINARY B

1. Make a table with columns labeled:
   (1) Decimal numeral being considered
   (2) How many of these in col. (1)'s number?
   (3) Resulting bit

2. a) Write D in column (1);
   b) Write 128 (= 8th bit's place) in column (2);
   c) Do D $\div$ 128;
   d) Get quotient Q & remainder R;
   e) Write Q in column (3)

3. <u>Repeat</u> (<u>until</u> column 2 = "1")
   (i.e., until all bits are computed):

   a) Write the current R in column (1);
   b) Write bit-place number in column (2);
   (find it by halving column 2)
   c) Call it N;
   d) Do R $\div$ N;
   e) Get quotient Q & remainder R;
   f) Write Q in column (3)

4. Let $b_8, b_7, \ldots, b_1$ be the numerals in column (3), from top to bottom

   Then B = $b_8\ b_7\ \ldots\ b_1$.