Number Systems & Coding Problems Compilation

Aggregated from Provided Images

Part 1: Number Systems Practice

From Image 1

- Convert 147_8 to base 10.
- Which of the following has the fewest number of 1s in its binary representation?

$$9A7_{16} \qquad B14_{16} \qquad 7431_8 \qquad 4265_8$$

- What is the base 16 equivalent for 41375_8?

From Image 2

- Convert 2122_{10} to hexadecimal.
- How many 1's are there in the binary representation of the decimal numbers from 22 to 32, inclusive?

From Image 3

- What is the value of $657383_{16} - 654321_{16}$ in base 8?
- How many 6's are there in the octal representation of the decimal numbers from 675 to 700, inclusive?

From Image 5

- Convert 6421_7 to base 10.
- Convert 9876 to base 13.
- What is 1101.1101_2 in base 10?

Part 2: Coding Problem (From Image 4)

PROBLEM: Given 3 positive integers, n, b, and s, generate the **next** n numbers in base b starting with s in the given base. We guarantee that the base will be between 2 and 9 inclusive. We guarantee that s is a valid number in base b. Find the base 10 value for the number of times the largest possible digit in the given base is found among all of the digits in the numbers generated.

EXAMPLE: If $n = 15$, $b = 8$, and $s = 2$, the numbers generated are 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 20. The largest possible digit in base 8 is 7 which occurs 2 times.

INPUT: There will be three integers representing the number of values to be found, the base to be used between 2 and 9 inclusive, and the starting value in the base given that will be no more than 16 digits.

OUTPUT: For each set of 3 input values, output a base 10 number representing the number of times the largest digit in the inputted base occurs in the sequence of numbers generated.

SAMPLE DATA:

SAMPLE INPUT	SAMPLE OUTPUT
1. 15 8 2	1. 2
2. 20 3 12	2. 21
3. 25 5 324	3. 24
4. 13 9 1652	4. 1
5. 45 2 1111011	5. 170