Quiz!

1. Computers represent numbers using switches. Each switch has two states, on and off. Which base system is being used here?

A. 10
B. 4
C. 2
D. 9

1. Computers represent numbers using switches. Each switch has two states, on and off. Which base system is being used here?

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B. 4
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D. 9

There are two states on (1) and off (0). This is the binary number system

2. How to write the number 20 using the symbols 0, 1, 2 (0 < 1 < 2)?

A. 20
B. 200
C. 202
D. 120

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A. 20
B. 200
C. 202 ✓
D. 120

0 - 0
1 - 1
2 - 2
10 - 3
11 - 4
12 - 5
20 - 6
21 - 7
22 - 8
100 - 9
101 - 10
102 - 11
110 - 12
111 - 13
112 - 14
120 - 15
121 - 16
122 - 17
200 - 18
201 - 19
202 - 20

3. If all the single digit numbers in a base system are 0, 1, 2, 3 then which base system are we using?

A. 1
B. 2
C. 3
D. 4

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D. 4 

4. In a number system with only ‘0’s and 1’s (0 < 1) what is the next number after 01011111?

A. 01011112
B. 01011110
C. 11011111
D. 01100000

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C. 11011111
D. 01100000 ✓

Next number can be obtained by starting from the smallest position, incrementing each character by 1, if the character has maximum value then set it to 0 and move to the next digit and repeat the same procedure

5. What is the maximum number we can represent using only the symbols 0 and 1 (you are allowed to repeat them as many times as you like)?

A. 1 (because we are allowed 0/1 only)
B. Some finite number
C. We can represent **any** number
D. 2

5. What is the maximum number we can represent using only the symbols 0 and 1 (you are allowed to repeat them as many times as you like)?

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6. In the roman numeral system, how many **different** symbols do we need to represent all integers (0 to ∞)

A. 4 (I, V, X, L, C)
B. 5 (I, V, X, L, C, M)
C. Some finite number
D. ∞

6. In the roman numeral system, how many **different** symbols do we need to represent all integers (0 to ∞)

A. 4 (I, V, X, L, C)
B. 5 (I, V, X, L, C, M)
C. Some finite number
D. ∞ ✓

We cannot represent large numbers using finite characters and without repeating characters more than twice!

7. In the decimal number system, how many **different** symbols do we need to represent all integers (0 to ∞)

A. 9 (1, 2, … 9)
B. 10 (0, 1, 2, .. 9)
C. Some other finite number
D. ∞

7. In the decimal number system, how many **different** symbols do we need to represent all integers (0 to ∞)

A. 9 (1, 2, … 9)
B. 10 (0, 1, 2, .. 9) ✓
C. Some other finite number
D. ∞

We use only the 10 digits 0, 1, … 9

8. How many different representations can a number in base 10, have in some other base?

A. 1
B. 2
C. Depends on the base
D. ∞

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B. 2
C. Depends on the base
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Think about writing the numbers from 0 in another base, the numbers keep increasing so we will never visit the same number twice.

9. A number is represented as (18) in some base system. What can be it’s representation in base 10?

A. 14 (base was 8)
B. 10 (base was 2)
C. 17 (base was 9)
D. All of the above

9. A number is represented as (18) in some base system. What can be it's representation in base 10?

A. 14 (base was 8)
B. 10 (base was 2)
C. 17 (base was 9)
D. All of the above

In the representation of a number in base x, all digits must be less than x!

10. Can fractions and real numbers be represented in a base other than base 10? Note: we can represent every number in base 10 for eg ⅓= 0.3333...

A. Yes
B. No
C. Depends on the number
D. Depends on the number and the base

10. Can fractions and real numbers be represented in a base other than base 10?
Note: we can represent every number in base 10 for eg ⅓= 0.3333...

A. Yes ✓
B. No
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We can extend the idea in to the decimal places as well, writing 0.1 in base 2 denotes 2^-1 = 0.5
We'll discuss more in the next class