Computer systems Bonus 1

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September 2018

1. **How would you represent sets as bit vectors?**
   Place a 1 if element is in the set and 0 if element is not in the set.
   if S = {1, 2, 3, 4, 5} then bit vector 10101 would be {1, 3, 5}.

2. **Give an example of a limitation of this representation.**
   The elements in the set will have to stay in the same order.

3. **What bit-wise operators can be used for the intersection and join of two sets in your representation?**
   intersection: &
   join: |

4. **Give a concrete example for sets of 5-6 elements, and calculate their intersection and their join**
   S = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
   A = 1010101010 = {0, 2, 4, 6, 8}
   B = 0111011001 = {1, 2, 3, 5, 6, 9}
   A & B = 0010001000 = {2, 6}
   A | B = 1111111011 = {0, 1, 2, 3, 4, 5, 6, 8, 9}