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import java.util.*;
import java.io.*;

class Solution{
    public static void main(String []argh)
    {
        Scanner sc = new Scanner(System.in);
        int t=sc.nextInt();
        for(int i=0;i<t;i++)
        {
            try
            {
                long x=sc.nextLong();
                System.out.println(x+" can be fitted in:");
                if(x>=-128 && x<=127)
                    System.out.println("* byte");
                if(x >= -Math.pow(2, 15) && x <= Math.pow(2, 15)- 1)
                    System.out.println("* short");
                if(x >= -
Math.pow(2, 31) && x <= Math.pow(2, 31)- 1 )
                    System.out.println("* int");
                if(x >= -Math.pow(2, 63) && x <= Math.pow(2, 63)- 1)
                    System.out.println("* long");
            }
            catch(Exception e)
            {
                System.out.println(sc.next()+" can't be fitted anywhere
);
            }

        }
        sc.close();
    }
}

```