

CSE 4810 – Algorithm Engineering

Lab 2 – Tasks – Part 2

1. Given a positive number n , efficiently generate binary numbers between 1 and n using the **queue** data structure in linear time.

Input

16

Output

1 10 11 100 101 110 111 1000 1001 1010 1011 1100 1101 1110 1111 10000

2. Given a string **S** containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.

An input string is valid if:

- Open brackets must be closed by the same type of brackets.
- Open brackets must be closed in the correct order.
- Every close bracket has a corresponding open bracket of the same type.

Input

{()}[]

Output

Valid

Input

(){}

Output

Valid

Input

(){}()

Output

Invalid