Discrete Mathematics I
Laboratory 1

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Complete each question by using C++.

a) Write a function which outputs the NOT operation of x.
```
bool NOToperater(bool x);
```

b) Write a function which outputs the AND operation of x and y.
```
bool ANDoperater(bool x, bool y);
```

c) Write a function which outputs the OR operation of x and y.
```
bool ORoperater(bool x, bool y);
```

d) Write a function which outputs the XOR operation of x and y.
```
bool XORoperater(bool x, bool y);
```

e) Write a function which outputs the IMPLY operation of x and y.
```
bool IMPLYoperater(bool x, bool y);
```

f) Write a function which outputs the EQUALIVANCE operation of x and y.
```
bool EQUALIVANCEoperater(bool x, bool y);
```

g) Given the symbol definitions:

Meaning	Symbol
NOT A	~A
A AND B	A * B
A OR B	A + B
A XOR B	A % B
A IMPLY B	A > B
A IF AND ONLY IF B	A ^ B

Write a program to find out the truth table of an expression. The number of variable is less than or equal to 10. **You can ignore the precedence of the operators and also the brackets.**

Input:
```
3
r s t
r*s+t>~r
```

Output:
```
r   s   t   |   r*s+t>~r
--------------------
T   T   T   |   F
T   T   F   |   F
T   F   T   |   F
T   F   F   |   T
F   T   T   |   T
F   T   F   |   T
F   F   T   |   T
F   F   F   |   T
```

Input:
```
2
a b
~~a%b
```

Output:
```
a   b   |   ~~a%b
-------------
T   T   |   F
T   F   |   T
F   T   |   T
F   F   |   F
```

h) Bonus Question!

Rewrite a program for question (g) with considering the precedence of operators and brackets.