Lab-7 Propositional Logic problems

KB:

R_1 ⇒ Alice mother of Bob

R_2 → Bob father of Charlie

R_3 ⇒ Father is a parent

R_4 ⇒ Mother is a parent

R_5 ⇒ All parent have children

R_6 ⇒ If someone is parent, children are sibling

R_7 ⇒ Alice ~~Ato~~ married to David

Hypothesis:

Charlie is sibling of Bob

Entailment:

~~R8~~ Let R_8 : Bob is parent

$R_2, R_5 \models R_8$

Let R_9 : Alice is parent

$\exists R1, R5 \not\models \exists R9$

Let R10 : Bob has a child, Charlie ~~has no siblings~~

$R8, R5, R2 \models R10$

Let R11 : Bob is sibling to Charlie

$R10, R8, R6 \models R11$

∴ We can prove hypothesis as true

$KB \models R11$

→ Model check algorithm:

```
def model_check(kb, query):
    ls = [symbol for symbol in symbols]
    return check_all(kb, query, ls, {})

def check_all(kb, query, symbols, model):
    if len(symbols) == 0
        if return True
    else
        p = symbols[0]
        r = symbols[1:]
        return check_all(kb, query, rest,
                         model union {p: true}))
    and check_all(kb, query, rest,
                  model union {not p})
```