J. Anukesh
1BM18CS038
AI LAB Test-2
29/12/2020

AI LAB TEST-2

Write-up

```
def fol_to_cnf(fol):
    statement = fol.replace("<=>", "_")
    while '_' in statement:
        i = statement.index('_')
        new_statement = '[' + statement[:i] + '=>' + statement[i+1:]
                        + ']&[' + statement[i+1:] + '=>' + statement[:i] + ']'
        statement = new_statement
    statement = statement.replace("=>", "-")
    expr = '\[([^\]]+)\]'
    statements = re.findall(expr, statement)
    for i,s in enumerate(statements):
        if '[' in s and ']' not in s:
            statements[i] += ']'
    for s in statements:
        statement = statement.replace(s, fol_to_cnf(s))
    while '-' in statement:
        i = statement.index('-')
        br = statement.index('[') if '[' in statement else 0
        new_statement = '~' + statement[br:i] + '|' + statement[i+1:]
        statement = statement[:br] + new_statement if br>0 else new_statement
    while '~∀' in statement:
        i = statement.index('~∀')
        statement = list(statement)
        statement[i], statement[i+1], statement[i+2] = '∃', statement[i+2], '-'
        statement = ''.join(statement)
    while '~∃' in statement:
        i = statement.index('~∃')
        s = list(statement)
        s[i], s[i+1], s[i+2] = '∀', s[i+2], '-'
        statement = ''.join(s)
```

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```
statement = statement.replace('-[∀', '[-∀')
statement = statement.replace('-[∃', '[-∃')
expr = '(~[∀|∃].)'
statements = re.findall(expr, statement)
for s in statements:
    statement = statement.replace(s, fol_to_cnf(s))
expr = '~\[[^]]+\]'
statements = re.findall(expr, statement)
for s in statements:
    statement = statement.replace(s, DeMorgan(s))
return statement
```