

Discrete Assignment

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Section-C

CODE

```
def test():
x = "p->q.~p^q.s->t.tvq"
pr = x.split('.')
clause = []
for i in pr:
    temp=i.split('->')
    if(len(temp)!=1):
        if temp[0][0] == '~':
            temp[0] = temp[0][1]
        elif temp[0][0] != '~':
            temp[0] = '~'+temp[0]
        clause.append(temp[0]+'v'+temp[1])
    else:
        temp=i.split('^')
        if(len(temp)!=1):
            clause.append(temp[0])
            clause.append(temp[1])
        else:
            clause.append(temp[0])
if(pr[len(pr)-1]==i):
    temp = pr[len(pr)-1]
    temp = i.split('v')
    if(len(temp)==1):
        temp=temp[0].split('^')
        if(len(temp)==1):
            if temp[0][0] == '~':
                temp[0] = temp[0][1]
            else: #temp[0] != '~':
```

```

        temp[0] = '~'+temp[0]
        clause[-1]=temp[0]
    else:
        if temp[0][0] == '~':
            temp[0] = temp[0][1]
        else: #temp[0] != '~':
            temp[0] = '~'+temp[0]
        if temp[1][0] == '~':
            temp[1] = temp[1][1]
        else: #temp[0] != '~':
            temp[1] = '~'+temp[1]

        clause[-1] = temp[0] + 'V' + temp[1]

    else:
        if temp[0][0] == '~':
            temp[0] = temp[0][1]
        else: #temp[0] != '~':
            temp[0] = '~'+temp[0]
        if temp[1][0] == '~':
            temp[1] = temp[1][1]
        else: #temp[0] != '~':
            temp[1] = '~'+temp[1]

        clause[-1] = temp[0] + '^' + temp[1]
    print(clause)
    return clause
def Main():
    clause=test()
    temp=clause

```

```

while clause != ['']:
    for i in range(0,len(clause)-2):
        cls1=clause[i]
        cls1=cls1.split('v')
        if(len(cls1)!=1):
            for j in range(1,len(clause)-1):
                cls2=clause[j]
                cls2=cls2.split('v')
                if(len(cls2)!=1):
                    if(cls1[0]=='~'+cls2[0] or '~'+cls1[0]==cls2[0]):
                        clause.remove(clause[i])
                        clause[i]=cls1[1]+'v'+cls2[1]
                    elif(cls1[0]=='~'+cls2[1] or '~'+cls1[0]==cls2[1]):
                        clause.remove(clause[i])
                        clause[i]=cls1[1]+'v'+cls2[0]
                    elif(cls1[1]=='~'+cls2[0] or '~'+cls1[1]==cls2[0]):
                        clause.remove(clause[i])
                        clause[i]=cls1[0]+'v'+cls2[1]
                    elif(cls1[1]=='~'+cls2[1] or '~'+cls1[1]==cls2[1]):
                        clause.remove(clause[i])
                        clause[i]=cls1[0]+'v'+cls2[0]
                    else:
                        clause[i]=''
                else:
                    clause

print(clause)

```

RuleofResolution()

example - 6

```
['~P^Q', 'R->P', '~R->S', 'S->T', 'T']
['~P', 'Q', '~RvP', 'RvS', '~SvT', '~T']
7 ~R ~P ~RvP
8 RvT RvS ~SvT
9 T ~R RvT
10 T ~T
11 Q Q
```

There exist an extra clause ''.

Out[21]: 0

example - 7

```
112 checkClauses()
['P->Q', '~P->R', 'R->S', '~Q->S']
['~PvQ', 'PvR', '~RvS', '~Q', '~S']
6 QvR ~PvQ PvR
7 ~R ~RvS ~S
8 Q QvR ~R
9 Q ~Q
```

empty clause exist

Out[20]: 1

example - 8

```
['T->MvE', 'S->~E', 'T^S', 'M']
['~TvMvE', '~Sv~E', 'T', 'S', '~M']
6 MvE ~TvMvE T
7 ~E ~Sv~E S
8 MvE ~M
9 ~E ~E
```

There exist an extra clause ''.

: 0

example - 9

```
112 | checkClauses()  
    | ['L->A', 'E->~I', 'A->E', 'L->~I']  
    | ['~LvA', '~Ev~I', '~AvE', 'L', 'I']  
    | 6 ~LvE ~LvA ~AvE  
    | 7 ~E ~Ev~I I  
    | 8 ~L ~LvE ~E  
    | 9 ~L L  
    |  
    | empty clause exist
```

Out[19]: 1