Compiler Design

Exp–4b Left Factoring

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CODE:

#Left Factoring

from itertools import takewhile

*def* groupby(*ls*):

    d = {}

*ls* = [ y[0] for y in rules ]

    initial = list(set(*ls*))

    for y in initial:

        for i in rules:

            if i.startswith(y):

                if y not in d:

                    d[y] = []

                d[y].append(i)

    return d

*def* prefix(*x*):

    return len(set(*x*)) == 1

starting=""

rules=[]

common=[]

alphabetset=["A'","B'","C'","D'","E'","F'","G'","H'","I'","J'","K'","L'","M'","N'","O'","P'","Q'","R'","S'","T'","U'","V'","W'","X'","Y'","Z'"]

s= "A->aAB|aBc|aAc"

while(True):

    rules=[]

    common=[]

    split=s.split("->")

    starting=split[0]

    for i in split[1].split("|"):

        rules.append(i)

    for k, l in groupby(rules).items():

        r = [l[0] for l in takewhile(prefix, zip(\*l))]

        common.append(''.join(r))

    for i in common:

        newalphabet=alphabetset.pop()

        print(starting+"->"+i+newalphabet)

        index=[]

        for k in rules:

            if(k.startswith(i)):

                index.append(k)

        print(newalphabet+"->",*end*="")

        for j in index[:-1]:

            stringtoprint=j.replace(i,"", 1)+"|"

            if stringtoprint=="|":

                print("\u03B5","|",*end*="")

            else:

                print(j.replace(i,"", 1)+"|",*end*="")

        stringtoprint=index[-1].replace(i,"", 1)+"|"

        if stringtoprint=="|":

            print("\u03B5","",*end*="")

        else:

            print(index[-1].replace(i,"", 1)+"",*end*="")

        print("")

    break

OUTPUT:

