LRE TRE : LRec RE not closed under Complementation? d (>Eaccepted L > RE T / RE

P₁ Algo P₂ P₁ Algo P₂ O If P₂ is having an algo (P₂ is duidalate) it mans P₁ will also have on algo (P₃ will be decidable) If P₂ is declarate then P₁ is also decidable Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: Convert P₁ → P₂ + Colve P₁ Algo for P₁: P₂ will be undecidable.

State Entry Problem of Th is undecideble. Given a TM, a state of EQ and WEZ^t Decide whether or not state 'q' is ever entered when 'w' is given to Th.

 $\underline{\mathsf{TM}}: \longrightarrow Q_0 \xrightarrow{(a,a,P)} (a_1) \xrightarrow{(b,b,L)} (q_2)$

q: qi), aba 2

Post Correspondence Problem

Given 2 Sequences of a Strings on Some alphabet Σ Say $A = W_1 W_2 W_3 \cdots W_n$ and $B = V_1 V_2 \cdots V_n$, we say that there exist a PC solution for pair (A,B) if there is a non empty sequence of integers i,j,k. Such that $W_i W_j \cdots W_k = V_i V_j \cdots V_k$

v=3

٩	ω,	w2	NB	В	∨,	V2	N3
	٥	ab	bba		baa	aa	ьр

You need to find out some sequence of integers in such a worf that wiwj ... Wh = Vi Nj ... Nk Sequence: 3231 PC Solution $\omega_3 \ \omega_2 \ \omega_3 \ \omega_1 = v_3 \ v_2 \ v_3 \ v_1$

bba ab bba a = bb aa bb baa

If you are able to find a sequence then it is called as PC Solution.

PCP is to device an algorithm that will tell us for any (A,B) whether or not there exist a PC Solution.

$$\omega_3 \omega_2 \omega_3 \omega_1 = v_3 v_2 v_3 v_1$$

bba ab bba a = bbaa bbbaa

Relate it to ambiguity problems in CFG.

You can derive this string is 2 news from start symbol is such a very that final string is same but intermediate I steps are different.

PC problem is converted to ambiguity problem and PCP is undecidable, So, ambiguity problem will also be undecidable.

Madified PCP

First String from A and first string from B has to be present at starting of Solution. WI WI WJ ... Wk = NI VI VJ ... VR

DECIDABILITY TABLE:

Problem	RL	DCFL	CFL	CSL	Recursive Longuage	REL
1. Does wel?	D	D	D	D	D	UD
(Mumbership Problem)						

2. IS L= \$? (Emperieurs Problem)	D	D	D	UD	UD	OD
3. Is L= E*? (completences problem)	D	UD	UD	UD	UD	UD
4. Is Li= La ? (Equality Problem)	D	UD	UD	UD	U D	00
5. IS LISL2? (Subset Problem)	D	UD	UP	90	90	90
6 Is $L_1 \cap L_2 = \varphi$	D	UD	UD	VD	UD	00
7. Is L fnite or not? (finitenise)	D	D	D	OD	פט	00
8. IS complement of L a language of Same type or not?	D	D	UD	D	D	םט
9. Is intersection of two languages of same type	D	UD	90	۵۵	۵	SD
10. Is L'regular longuage.	D	D	UP	UP	υD	VD