Unit-3, Context force Crocamman * Grovaması Language generator. components 1. Vasiables 2. Terminals 3. Production 4. Start State 1. Variables To store data and can be replaced. Represented with capital letters. End faint of readuction. Represented with small letters 3 Peroduction give neu value l'state. Represented with ->! 4. Start state First peroduction. Represented with 'S' Representation of Grammasi G= (V, T, P, S) Note: Tearninals - Keywoods (if, else If, lox, while, do while) digits (0-9) Symbols (+, -, x, /) Louveroose Litters (a-2) Chomsky hierarchy of Generative gramman / Types of gramman Noam Chomsky - founder 1. Type O grammari (Phorase stoucture) Type I gramması (Context sensitive gramması) Type 2 grammas (Contex free grammas) Type 3 goamman (Regulan goamman

1. Type Ogoramması the fire of bise discovery are an enciloused after the grant are an enciloused after the sear and subscript after the sear and are form of the search and a search a search and a search and a search and a search a search a search and a search a search a search a search a search a search and a search a ('Example -CE (VUT) and BE(VUT)* 3->aAble Agnel no croitsisteer on aA >bAA bA→a Pican Lave E, E can appear on RHS. · O cannot have E, LHS cannot be E, 2. Type I grammar with lot you A grammar G = (V,T,P,S) is said to be type ! if the , exerting of the form of or B where, account and pecount length of B must be obleast the length of a. 1B121a1 · E cannot be at LHS as well as RHS => E-free rommarg RHS DO Example -S->aAb aA -> bAA bA → 9aa A grammar Ge(V,T,P,2) is said to be type 2 if all 2. Type 2 goramması productions were of the form A-> a where ∝6 CVUT)* LHI should be variables or Non-Terminals RHS can be E. Example-3-a BIBALE A -> aB B -> b Al G

Type 3 goramması A grammar a= CV,TPS) is said to be types if gramm reserve the son reserve belgive set of biod is Example -A > B (exight linear)

A > B w (left linear) Right linear - II NT (non-terminals) or voruables is 2HA set abrovat tracery S> aaBlobAle A > aAlb B-bBlale Left linear-IJ NT or variables offerers towars LHS. Example -S->BaalAbble A-> Aalb B->BblalE * Design Language from CFG 1. G = CV, T,P,S) V2 { 8 } T= {a,b} P= {3->as |b3 5 = 2 3 3 -> as 0000 $d \leftarrow e$ s->as Sa aas s->ab 3->aaas S→aaab 3-> a*b L(a)=a*blab

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G=(VT,P,S)
   V= 283
  T= {a}
   S = 2 9 %
   P2 {3-> as 1 & }
                         S=ast - month del
> S -> as
              s-as
                         S \rightarrow aas
S \rightarrow aaas
S \rightarrow aaa - - - aa
   s->a€
              s->aas
              S → oa €
   g->a
              s->aa
                              Flyleria.
    1.e., 9 → a*e

→a*
                      List of Canal ( G for the Kor Will )
                        · Mariantina
    ~ L(a) 2 d
                                     All W. . 1
 3. V= 293
                                   311119 -
   T={a}
    3= 20%
                        the broad spraint and
    PES-aas laas
                                       (31711)
   S->aas
                s->aas
                  -> aaaas
      → aaaa
                   >aaaaaas
                  \rightarrowaaaaaaaa
    i.e, s -> (a a)+
       L(Cr) = (aa)+
                                         - 110 6.
4. G=(ES,T3, Ea, b, c3, P,S)
    Pz {S->aTIT->bbT/C3
-> S->aT
                    S->aT
    -> abbT
                     ->abbT
     ->abb C
                      -> abbbbT
                      -> abbbbbbbT
                      ->abbbbbbc
   ie,s -> a (bb) to
      1. L(b) =a(b)tc
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5. S -> a Ca c->acalb s -> aCa S->aca ->aba →aa Caa →aaaCaaa → aaabaaa i.e., s → atbat :, L(a) = atbat * Design CFG forom FA <u>→</u>\$\text{\$\ext{\$\exitt{\$\exitt{\$\exitt{\$\ext{\$\exitt{\$\exititt{\$\ex > Teransitions! s(s,a)=s of Mad Moera, Adlera Sogrammosi: 9>aS : 'S is final state S->€ G=(V,T,P,S) V = 853 Tzgaz P=93->asle3 ८ =१८५ The igrammar is defined as, Transitions: G=(V, T, P,S) 8(s,a)=A V={S, A} S(A,a)=A Tz {a} gerammas: P= {S->aA, A->aAle} s->aA S={9} A->aA ". A is find state A>E

3. X a Brank Teransitions: Grammar: SCS,a)=A S->aA S(g,b)°5 S->bs S(Aja) = A A->aA S(A, b) = A $A \rightarrow bA$ A-SE " A is final state tratte e com The grammaris defined cas: Ga(V,T,PS) N= 6 3.45 to mention T= Earb& P= {S->aAlbs, A->aAlbAlES 1. Promy ries 3=898 did a bolish run Transitions, eyrammar: 8(A,0)2A A 0<- A S (AID2B A->IB S (B10)2C B->0 C 8 (B11) 2 B B->IB S (C10)2A C->OA s (cop) = B C>IB .'C is the final C>E The Igrammon is defined as: Barbara Same G=WTP,SB V= {A,B F} T= {0,13 P= {A ->OA | IB, B->IB | OC, C->OA | IB | E'S SESAS

5. -35 a x B a x B D a A 1 15 - 1 -> Toransitions! Igiammar: S(s,a)=A s->aA 1111 A-ZaB S(A,a) - B B->aB S(B,a)=B BJE : Bs final state The igrammaries defined as: G=(V,T,P,S) 40, V= { S, A, B} T= { a3 P= {3 > aA, A > aB, B > aBle's 3 = 2 2 3 * Passing / Desvivation The sequence of substitutions used to altain a portional resident strains is called passing! description. $S \rightarrow \times \propto Y$ $\infty \rightarrow \beta$:, S->XBY Note: yelno cellaiser sof etitelul. Types of Bulistitution. 1. Left most devivation 2. Right most devivation team that aft mout beiltho era anoitoubored 1. LMD production. Example -8->X1X x->a y ->a to desine aba

```
z \rightarrow \overline{x} \lambda x
                               in the
   ->ayx
    ->abx
                               11.19.19
    ->aba
                              181 / 1 A
 RMD
2.
                            and elling from
  S→xyx; x→a, y > b
                            MALE WALLES
  S->xya
    → ×ba
                             (2,1,7,1/)
   -> aba
                             Au, A, 2 1 1
 S->AB
  ALSOANE
                         - A, Athan my wy
  B->Bble
  To desive: aab
                       recolaring solly
         of home and the side while to some
> LMD:
     → AB B CA → aaA) (A→ E)
  S-> AB
     →aa Bb (B->E)
                                Y WX C - "
     -> aab
                                 - 4x-10
                               roxx - -
  RMD!
             (B->Bb)
    S->AB
              (B→E)
    S -> ABb
              CA-saaA)
    S -> Ab
              (A-> E)
    s->aaAb
    S->aab
  S-> aBlbA
  A-> a las | bAA
   B-> blbSlaBB
   To desive: aaabbabbba
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- 1

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LMD:
 ~
                 (B-> aBB)
    s -> a B
                 (B->aBB
     -> a aBB
                 (B-> bs
      -> aaaBB
                  Ad <- e)
      -> aaabs
                  (20<-4)
      -> aaabBA
                   (S->6A)
      → aaabbas
      -> aaabbabA (A -> bAA)
     →aaabbabbAA
     →aaabbabbbA
     -> aaabbabbba
   RMD:
             (B->aBB)
    s->aB
     -> aabb (B->abb)
     ->aaBaBB (B->bS)
     -> aaBaBbs (3->bA)
     -> aa Ba BbbA (A->a)
     →aaBaBbba (B→b)
     → aa Babbba (B→aBB)
     -> aaaBBbbba (B->b)
     -> aaaBbabbba (B->6)
     ->aaabbabbba
3. 3 > a AB
  A->bBb
  B->ALE
  To desive: abbbb
> LMD!
  S->aAB (A-> bBb)
    -abbbb (B->A)
    -> abAbB (A -> aBb)
    →abbBbbB (B→E)
    →abbbbB (B→E)
    -> abbbb
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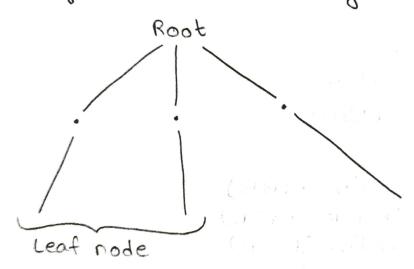
RMD: S-> a ABB->A) HOND OF -> aAA (A->bBb) >aAbBb(B>€) The Part of the -> aAbb (A->bBb) > a bBbbb (B>E) -> abbbb AAddadajas 4. G= (3, B3, 6c, d2, P, S) Addadadani. endaledation n P= 93-> cBSIC To desive: ccd cdd cc (22 ~ 8) S>CBS (B->SdB) 0000 >csabs (s>c) Son Bally -> ccdBs (B->SdB) >ccdsdBB (S>c) ddare >ccdcdBS (B->dc) Co->c) o'ndanne -> ccdcddcs -> ccdcddcc (ROD: S-XCB& 3-XCB6B8 >CBCBQ CBCCC CCBS cdec

* Passe Toree / Desiration Tree

The obscious are form of a tree.

Root which habilited as '3'.
Lakel of witernal vertex is 'vosuable'.

Each vertex can be either variable o Terminal (E The deaf node should always be in terminal.



Parise tree.

BUD:

→19+EXE →19+E

>12 +14 x d

Buse tree's

2. S->aBlbA

A-PalaSlbAA

B-> bl bslaBB

N= aaabbabbba

> LMD:

(Basea) Basea

-> aabb (B-> abb)

→aaaBBB (B→b)

→ aaabBB (B > b)

PaaabbB (B→aBB)

-> aaabbaBB(B->b)

-> a a a b b a b B (B-> b9)

→ aaabbabbs (Ba>bA)

->aaabbabbbb (A->a)

-> aaabbabbba

Parse Tree!

