Assumptions

- -> In the order of statements, Edefinetype strits) were bloced after (type definitions)
- Records and Unions can how have sucords Junions as their fields (nesting)
- Added semicolous to funcaustrat and define typestrat for uniformity
 - -> Binded colon with global-or-not
 - -) Read function must be called only with TK-10 as argument and not TK-NOM of TK-RNUM constants.
- -> Records lunions fields can be also now be weithen with weather
- -> (strot) (otherstrots) was suploced with (atherstrots)
- -> Added TK-OP arel TK-CL in conditional Statements.
- -> Rumored ambiguity forom anotheratic Expansion
- -> Inumposated baccoonce order in on threatic Expension
- Introduced firstop and secondop instead of using approxime to facilitate precedence
- -> Made negation of boolean Expression more intuitive by adolling borranthasis obseund the negated bodeon Expression

| Good | Jatin Aggarwal-201884470884P |
|------|--|
| Gray | N Company of the Comp |
| 5 | kush mehta — 201885A70956P |
| | Harsh Thurghanuala-2018BSA70691P |
| | Makel Donesh Royleigh - 7018B4A70532P |
| | Porushoroth Armout - 201885 A 70897 D |

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1)  / (program) ==> (other Functions) <main Function)</pre>
?> < main Fondion> ==> TK_ MAIN < stmts> TK_ END.
3> (other Functions) = = => (function) (other Functions) (E
    (function) === > TK_FUNID (injut-pas) Coutput_pas) TK_SEM (SHINTS) TK_END
5) (input-par) ==> TK_INPUT TK_PARAMETER TK_LIST TK_SQL (parameter_list)
     (output_par) = ==> TK_OUTPUT TK_PARAMETER TK_LIST TK_SØL (parameter_list)
    (parameter_list) ===> (data Type) TX_10 (granaining_list)
8> (dataType) ===> (primitiveData type) (constauted Datatype)
    (polimittie Datotype) ===> TK_INT | TK_REAL
(constanted Datotype) ===> TK_RECORD TK_RUID | TK_UNION TK_RUID
      (stroits) = == > (type Definitions) (dedications) (definetype stroits)
      ( somaining-list) ===> TK_ comma (parameter list) I &
     ( type of initions) ===> < type of inition) < type of initions) | E
      (type ofinition) === ) TK_UNION TK_RUID (field definitions) TK_ENDRECORD
      (type againstian) ===> The union The Part (field against thous) (more fields)
      ( Brew odinitions) ===> < freed ofinition) (field ofinition) (more Figlds)
14.
      ( field depirition) ===> TK_TYPE (dataType) TK_colon TK_FIELDID TK_SEM
157
 16.7
       (more Fields) ===> ( field Definition) (more Fields) ( E
 17)
       (declaration) ===> (declarations) (declarations) (t
       Lateration > === > TK_TYPE (data Type) TK_(OLON TK_ID (global - OY_rot) TK-SEM.
 187
  19.7
       Lglobal LOT-not) ===> TK_(OLON TK-GLOBAL | E
 207
       Latert) ===> (assignment 9+m+) (theyathre 5+m+) [ (conditional strot) (to strot) | (to coul strot)
 217
 227
```

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24) (assignmentstrat) = 22 (Single Or RecId) TK_ASSIGNOP (on through Expression) PK_SEM
25) (sigle or RecId) ===> TK_10 (signle or RecPrime)
      Largle Or RecOrNum) ===> (single Or Rec Id) 1(TK_NUM | TK_RNUM
    ( Single On Rec Princ) === ) TK_DOT TK_FIELDID ( Single Or Rec Prince) | E
21.)
28) Lfuncall 9mt> ===> (output formerers) TK_CALL TK-find TK_with
     TK_PARAMETERS Linbut Pomameters > TK_SEM
29) Coutput bonometers ==> TK_SQL (IdLIST) TK_SQR TK_ASSIGNOPIE
      (input possometers) = ==> TK-50L (ialist) TK-50R.
      (iterative Start) ===> TK_WHILE TK_OP (boolean Expression) TK_CL (other starts)
307
37) (unditional strit) ===> TK_IF TK_OP (buoloon Exprassion) TK_CL TK_THEN (other strits)
33) (conditional Paince) ===> TK_ELSE (Otherstrip) TK_ENDIF | TK_ENDIF
34) ( losant) ===> TKREAD TK_OP TK_ID TK_CL TK_SEM/TK_WRITE TK_OP (single Or Recor Mun)
5) (an timetic Exposession) ===> (as the estic frime) (aperator) (an threat Exposession) | TK-0P
     (and the Exposition) TK_CL (var) < multiplicate) < add or Sub)
    (arithmetic Prime) = = = = > (var)
    ( operator > = ===> TK_PLUS | TK_MUL) TK_MINUS | TK-DIV
36.
     (budgen Expossion) == > TK_OP (boolean Exposusion> TK_CL (bodgen Extension> | TK_NOT
37)
      TK_OP ( boolean Expression > TK_CL ( boolean Expression > 1 ( boolean Prime >
38
     ( boolean Extension) === > < logical OP> TK_OP < boolean Extraor> TK_CK ( t
397
     (bus lean Pointe) ===> (vor) ( suplational of) (vor)
40)
      (var) ===> TK_ID | TK_NUM | TK_RHUM
     (Invital OP) ===> TK_ANDITK_OR
Creditional OP) ===> TK_LT | TK_LE | TK_EO | TK_GT | TK_GE | TK_NE
417
42
43
     ( networstand) ===> TK_RETURN ( optional Ration) TK_SEM
447
      Loptional Return > ===> TK_SOL ( MIGH) TK_SOPIE
Hay
```

46) (iduat) ===> TKIDL mose_idu) the Longetus ===>TK-comma Liability + 48) (definetype strots) ===> (definitype strot) (definitype strots) (t 40 (definelyte stat) = ==> TK_DEFINETYPE (A) TK_RUD TK_AS TK_RUD TK_SEM 50) (A) ==> TK-RELORD | TK-UNION 51) (addassib) ===> (secondolp) (arithmetic Expression) (E 52) (mulpiv Adth) ===> (power Adth) (mulorally) 54) < powerstaith >= ===> TK-OP (ON THATICAL EXPRESSIONS > TK-CLITK-ID | TK-NUM | TK-RNUM

55? < (Mestop) ===> TK-MWL|TK-DIV 56.> < se wordop > ===> TK-PLUS | TK_MINUS

```
1) First (Lpagrows) = FTK_FUND, TK_MAIN }
3 First ((main function)) = { TX_MAIN}
3) First ((ether Functions?) = {TK-FUNID, E}
( First ((fundion)) = { TK_FUNIO}
                                                                      extra RUID in txt file
57 First (Linput-pox)) = & TK-INPUT3
First (( output_box) = { TN_OUTPUT, t}
7) First ((tomometer List))= 9 TK_INT, TK_REAL, TK_REIORD, TK_CAHON )
B) First (LADATUPE) = & TK_INT, TK, REAL, TK_RECORD, TK_UNION )
9) 1985 (( Lpainitire Doubthbe) = { TK-INT, TK-REAL}
10) First (Lionstructed Datatype) = { TK-RECORD, TK-UNION}
12) Flost ((stmts)) = { TK-RECORD, TR-UNION, TK-TYPE, TK-ID, TK-WHILE, TK-IF,
(13) First (Ltyle definitions)) = { TK-RECORD, TK-UNION, E}
(Lytendinition)) = { TK-RECORD, TK_ONION }
15) Prost (Light Spiriture) = {TK-RETORD, TR-UNION}
16.) Prost ((field ofinitions)) = { TK_TYPE}
17) Prost ((field adjointhin)) = { TK-TYPE}
     First ((more Fields)) = { TX-TYPETE)
     Pirot (Laudonations)) = {TK_TYPE, E}
18.7
      First (L distoration)) = { TX-TYPE}
19:
132/ First ((Stobal-or-not)) = { TX_colon, 6}
First (( other state)) = { TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE,
TK_SOL, TK_CALLE, LZ
Prost (story) = { TK-10, TK-WHILE, TK-IR, TK_READ, TK-WRITE,
TK-SOL, TK-(RIL)
```

SHY First (Cassignment Strot) = {TK-10} 25.) First ((single Or Rec-Td)) = { TK-OB} First ((fingle 0 x Rec Num)) = { TR-NUM, TR-RNUM, TK-ID} First (& Single Or Rec Poline) = {6, TR-DOT} 28) First (/ funcaustrat) = ETK_60L, TK_CALL) 39) First ((authors motors))= { TK-SOL, t} 30> First (Linkut parameters)) = {TK 502} 31) First ((iterative strut)) = } TK_WHILE} 32) Flost ((conditional strat)) = {TK_IF} Prist ((conditional Poince)) = { TN-ELSE, TK_ENDIP} elsePart === conditional Prime (34) First (Liosmot))= { TK-READ, TK-WRITE) 35.7 First (Lanthmetic Expression)) = { Tk-OF, Tk-ID, Tk-NOM, Tk-RNOM} 36) First ((anthornal time)) = { TK_ID, TK_NUM, TK_RNUM} First (Leperator) = { TK_PLUS, TK_MUL, TK_MINUS, TK_DIV} First ((bodean Expression)) = { TK-OP, TK-NOT, TK-NOT, TK-ID, TK-NUM, TK-RNUM) First (Lloolean Brotension))= {e,TK-AND, TK-OR) 397 First (boolean Prime) = { TK-10, TK-NUM, TK-RNUM} 41) First (LVar) = { TK-10, TK-NUM, TK-RNUM) 47 First ((lugical up)) = { Tk-AND, Tk-OR) 437 Flast (Literational op)) = { TR-LT, TK, LE, TK-EB, TK-GT, TK-GE, TK-NE} YHY Frost (Loudon stmt)) = { TK- RETURN?

First ((optimal Ration)) = 2 TK = SQL8, E3 First (LidList?) = { TK-10} 47) First ((more ids)) = & TK-comma, +) (48) Trust ((definetype strats)) = {e,TK-DEPINETYPE} 497 First (Confinally the start)) = 5 TK-DEFINETYPE) SON FIRST (LAY) = ETW- RECORD, TK-UNION } 51> ~ Long Div Anith >= ETN_OP, TK_ID, TK_NUM, TK_RNUM'S

52> ~ Londorsub) = E E, TK_PLUS, TK_MINUS } 53.> 1 (MUI ORDIV) = EE, TK-MUL, TK-DIV } 54) Frest (K poventAnth)) = {TK_OP, IK_ID, TK_NUM, TK_RNUM} 55.) First ((firstop?) = ETK_MUL, TK_DW? First ((second Op))= { TK_PLUS, TK_MINUS}

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i·
      Follow ((program)) = {$3
 2)
      Follow (LmainFurction) = { $3
      Follow (( other Functions >) = {TK_MAIN}
 3.7
      Follow ( (function ) = ETK_FUNID , TK_MAIN3
47
     Fellow ( (toput fox)) = { TK-OUTPUT, TK-SEM}
5.7
    Follow (Loutput pas)) = 8 Th-sem3
6)
     Fellow ((parameter List)) = ETK-SOR3
7)
     Follow (LalatoType)) = {TK-108, TK-10LON3
     Follow ((pointitive partity be)) = {TK_108, TK_colons
87
     Fallow (( anstructed Data type)) = {TR-10}, TX _ COLONS
9.7
     Forent ( remaining 43+7) = {TK-SOR}
                               ETK-TYPE, BORD, TK-ID, TK-WHILE, TX-IF, TX-READ,
117
     Follow ((stmts)) = &TK-EMO}
                                TY_WRITE, TK-SQL, TK-CAIL, TK-DEFINETYPE, TK-RETURNS
127
                               STK-REIORD, TK-UNION . TK-TYPE, TK- RETURN, TK-10,
     Follow (Ltyle Definitions) =
                                TH_WHILE, TK-IF, TK-READ, TK-WRITE, TK, SOL, TK-CALLS
137
     Form (Lype definition) =
14.)
                               { TK - RECORD , TK - UNION , TK - TYPE , TK - RETURN , TK-ID ,
                                TX_WAILE, TK-TF, TK-READ & TK-WRITE, TK-SOL, TK-CALLS
     Fottom (Lyperfinition) 2
157
                                { TK- ENDRECORD, TK- ENDINIONS
    FOLLOW (1 field Definitions?) =
    FOLLOW ( { field Definition >) = { TX-TYPE, TX-ENDRECORD, TX-ENDRIUM }
16.7
    Follow (LmoreFields) = { TX-ENDRECORD, TX-ENDUNION}
17)
Pollow (Laborations)) = STR-DEFINETUPE, TK-IF, TK-READ,
                              TK-WRITE, TK-SOL, TK-CALLY, TK-RETURNS, TK-RETURNS
                             { TK-TYPE , TK-RETURN, TK-ID, TK-WHILE , TK-IF,
207 Fallow (Landonation) =
                               TK-READ, TK-WRITE, TR-SOL, TK-CALL, TK-DEFINETYPES
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21) Follow ((globool-or-not)) = &TK_SEM3
22) Follow (( Other States))= & TK-RETURN, TK-END WHILE, TK-ELSE, TK-ENDIP)
                       & TK-ID, TK-WHILE , TK-IF, TK-READ, TK-WRITE ,
                         TK_SOL, TK-LALLY, TK_ RETURN, TK-ENDWHILE, TK-ELSE,
 23) Fallow (15tmt)) =
24) FOCIOUS (Lossignment strot) = {TKID, TK. WHILE, TK-IF, TK-READ, TK-WRITE, TK-SQL,
                              TK CALL, TK - RETURN, TK - ENDWHILE, TK - ESE, TK - ENDIPS
 25) Follow ((single Or RecId)) = {TK-ASSIGNOPS, TK_CL}
 26) Follow (Lengte or Rection) = {TK-CL}
27) FOLLOW (LSingle Or RecPoints) = {TK-ASSIGNOPETK_CL}
                               { TK-ID, TK-WHILE, TK-IF, TK-READ, TK- WRITE,
POLICIE (L fun call strat)) = TK-SAL, TK-GALL, TK-RETURN, TK-ENDWHILE, TK-ELSE,
TWENDIE?
201) Follow (Louthet parameters))= {Tx-cALL}
30) Follow (Linkut paramaters))= §TK-SEM3
                             ETK-10, TK-WHILE, TK-IF, TK-READ, TK-WRITE,
31) Follow ((Herative Strati)= TK_SQL, TK_CALL, TR_RETURN, TK_ENOWHILE,
                              TK-ELSE, TK-EMAR)
32) Follow ((conditional Strat))= {TK-10, TK-WHILE, TK-IF, TK-READ, TK-WRITE,
                              TK-SOL, TK-CALL, TK-RETURN, TK-ENDWHILE, TK, ELSE
33) Fallow ((conditional Poince))= & TK-ID, TK-WHILE, TK-IF, TK-READ, TK-WRITE,
                               THEAL, THE CALL, THERETURN, THE END WHILE, THE LISE,
34) Follow (Libstont)) = { TK-ID, TK-WHILE, TK-IP, TK-READ, TK-WAITE,
                                                                           TK_RNO IP }
                           TK-SAL, TK- CALL, TK- RETURN, TK- ENDWHILE , TK-BLSE, TK-BHOLP)
357 FOLLOW ( ( Carolth metic Expression ) = {TK_CL, TK_SEM}
36) Follow ( Carithmetic Prime) = & TK_AUS, TK_MUL, TK_MINUS, TK_DIVS
377 Follow (Copontor) = {TN OP, TK-10, TK-NOM, TK-RNOM}
    Fellow (( bodean Expression)) = ETK-CL3
```

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397 Follow ((booleon Extension))= & TK,CL}
 40.> Factor ((boolean Poime) = { TK-CL}
 41) Fellow (( vois) = & TK-PUS, TK-MUL, TK-MINUS, TR-DIV, TK-CL, TK-SEM,
                            TK-10, TK-HOM, TK-RNOW 3
4:2> FOLLOW ((logislop))= } Th-UP3
43:> Follow ((gelational op)) = { TK-IP, TK-NUM, TK-RHUM}
44) FOLIOU (( xolukn smot)) = { TK-END}
45> Follow ({aptional Retuan))={ TK_SEM}
46> Follow ((idust))= { TK-50 R}
47> Foron (Lmoretes)) = { TK-59R}
(48) Follow (Laginotype Strats)) = 5 TX-RETURN, TX-DEFINETYPE STX_TYPE, TX-10,
TX-IF, TX-CALL, TX-SOL, TX-WHILE, TX-READ,
49) Follow (( affinelyte strat)) = { TK-DEFINETYPE, TK-RETURN), TK, TYPE, TK-10,
                                                                      TK-WEITE 3.
     FOLLOW (LAX) = 8 TK-RUIO3
     Pollow ((addorsub)) = & TK_CL, TK_SEM3
     Follow ((muldiv Arith)) = & TK. Plus, TK. minus, TK_CL, TK_SEM }
53) Follow ((molosoly)) = fTk_Plus, Tk_Minus, Tk_CL, TK_SEM)
54) Follow ((powerd AdM))= ? TK_MUL, TK_DIV, TK_PWSB, TK_MINUS, TK_CL, TK_SEM?
     Follow ( L friestop?) = & TK_OP, TK-ID, TK_NOM, TX-RNOM?
      Follow ((secondOp)) = & TK-OP, TK-ID, TK-NUM, TK-RNUM)
      FOILDER (LYON)) = { TK_LT, TK_LE, TK_EB, TK_GT, TK_GE, TK_NE,
96)
                         TX-a3
577
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