**Definitions CFGs**

**Old Class CFG**

**class ki**

**Class Definiton CFG**

**Note:-**

**Return statement SST me nhi rkhana or return st optional h**

**<class\_def> → <class\_header> class ID <extend\_st> <implement\_st> : ( <class\_body> ) Not used after left factoring**

**Agar AM kch bhi nhi h to bydefault public hoga**

**<class\_header> AM <ch2> | final | €**

**<ch2> -> final**

**<ch2> -> €**

**<extend\_st> → extends ID**

**<extend\_st> -> €**

**<implement\_st> → implements ID <interface\_rec>**

**<implement\_st> -> €**

**<interface\_rec> → , ID <interface\_rec>**

**<interface\_rec> -> €**

**<class\_body> → AM <cb3>**

**<class\_body> → static <amh3> <cb2>**

**<class\_body> → final <cb2>**

**<class\_body> → <cb2>**

**<class\_body> → €**

**<cb2> -> DT <cb2a>**

**<cb2> -> String <cb2a>**

**<cb2> -> dict <cb2b>**

**<cb2> -> ID <cb2c>**

**<cb2> -> void ID { <params\_list> } : <body1> <class\_body>**

**<cb2a> -> ID <cb2a1>**

**<cb2a> -> [ ] <arr\_mul> ID { <params\_list> } : <body1> <class\_body>**

**<cb2a1> -> <dec1> <class\_body>**

**<cb2a1> -> { <params\_list> } : <body1> <class\_body>**

**<cb2b> -> ID <cb2b1>**

**<cb2b> -> [ ] <arr\_mul> ID { <params\_list> } : <body1> <class\_body>**

**<cb2b1> -> dec3> <class\_body>**

**<cb2b1> -> { <params\_list> } : <body1> <class\_body>**

**<cb2c> -> ID <cb2c1>**

**<cb2c> -> [ ] <arr\_mul> ID { <params\_list> } : <body1> <class\_body>**

**<cb2c1> -> <dec2> <class\_body>**

**<cb2c1> -> { <params\_list> } :<body1> <class\_body>**

**<cb3> -> DT <cb2a>**

**<cb3> -> String <cb2a>**

**<cb3> -> dict <cb2b>**

**<cb3> -> ID <cb3a>**

**<cb3> -> void ID { <params\_list> } : <body1> <class\_body>**

**<cb3> -> static <amh2a> <cb2>**

**<cb3> -> final <cb2>**

**<cb3a> -> <cb2c>**

**<cb3a> -> { <params\_list> } : ( <constr\_body> ) <class\_body>**

**<amh2> -> € | static <amh2a> | final**

**<amh2a> -> final**

**<amh2a> -> €**

**<amh3> -> final**

**<amh3> -> €**

**<dec1> -> <init\_var> <list\_var>**

**<dec1> -> [ <OE> ] <arr\_size> <init \_arr> <list\_arr>**

**<dec2> -> <init> <list>**

**<dec2> -> [ <OE> ]<arr\_size> <init\_arr> <list\_arr>**

**<dec3> -> <init\_dict> <list\_dict>**

**<dec3> -> [ <OE> ]<arr\_size> <init\_arr> <list\_arr>**

**<constr\_body> -> <pointer\_st> <MST>**

**<pointer\_st> -> TS { <args\_list> } <pointer\_st>**

**~~<pointer\_st> -> €~~**

**<pointer\_st> -> ln**

**<args\_list> -> <OE> <list\_args>**

**<args\_list> -> ∈**

**<list\_args> -> , <OE> <list\_args>**

**<list\_args> -> ∈**

**Yahan class body ki khtm**

**Class Definiton CFG New**

**Note:-**

**Return statement SST me nhi rkhana or return st optional h**

<class\_def> → <class\_header> class ID <extend\_st> <implement\_st> : ( <class\_body> ) Not used after left factoring

**Agar AM kch bhi nhi h to bydefault public hoga**

<class\_header> 🡪 AM <ch2> | final | €

<ch2> -> final

<ch2> -> €

<extend\_st> → extends ID

<extend\_st> -> €

<implement\_st> → implements ID <interface\_rec>

<implement\_st> -> €

<interface\_rec> → , ID <interface\_rec>

<interface\_rec> ->  €

<class\_body> → AM <cb3>

<class\_body> → static <amh3> <cb2>

<class\_body> → final <cb2>

<class\_body> → <cb2>

<class\_body> → €

<cb2> -> DT <cb2a>

<cb2> -> String <cb2a>

<cb2> -> dict <cb2b>

<cb2> -> ID <cb2c>

<cb2> -> void ID { <params\_list> } : <body> <class\_body>

<cb2a> -> ID <cb2a1>

<cb2a> -> [ ] <arr\_mul> ID { <params\_list> } : <body> <class\_body>

<cb2a1> -> <dec1> ln <class\_body>

<cb2a1> -> { <params\_list> } : <body> <class\_body>

<cb2b> -> ID <cb2b1>

<cb2b> -> [ ] <arr\_mul> ID { <params\_list> } : <body> <class\_body>

<cb2b1> -> dec3> ln <class\_body>

<cb2b1> -> { <params\_list> } : <body> <class\_body>

<cb2c> -> ID <cb2c1>

<cb2c> -> [ ] <arr\_mul> ID { <params\_list> } : <body> <class\_body>

<cb2c1> -> <dec2> ln <class\_body>

<cb2c1> -> { <params\_list> } : <body> <class\_body>

<cb3> -> DT <cb2a>

<cb3> -> String <cb2a>

<cb3> -> dict <cb2b>

<cb3> -> ID <cb3a>

<cb3> -> void ID { <params\_list> } : <body> <class\_body>

<cb3> -> static <amh2a> <cb2>

<cb3> -> final <cb2>

<cb3a> -> <cb2c>

<cb3a> -> { <params\_list> } : ( <constr\_body> ) <class\_body>

<amh2> 🡪 € | static <amh2a> | final

<amh2a> -> final

<amh2a> -> €

<amh3> -> final

<amh3> -> €

<dec1> -> <init\_var> <list\_var>

<dec1> -> [ <OE> ] <arr\_size> <init \_arr> <list\_arr>

<dec2> -> <init> <list>

<dec2> -> [ <OE> ]<arr\_size> <init\_arr> <list\_arr>

<dec3> -> <init\_dict> <list\_dict>

<dec3> -> [ <OE> ]<arr\_size> <init\_arr> <list\_arr>

<constr\_body> -> TS <constr\_body2>

<constr\_body> -> DT ID <dec1> ln <MST>

<constr\_body> -> String ID <dec1> ln <MST>

<constr\_body> -> dict ID <dec3> ln <MST>

<constr\_body> -> ID <SST’> <MST>

<constr\_body> -> <ifelse\_st> <MST>

<constr\_body> -> <while\_st> <MST>

<constr\_body> -> flowcontrol <MST>

<constr\_body> -> <trycatch\_st> <MST>

<constr\_body> -> <throw\_st> <MST>

<constr\_body> -> ∈

<constr\_body2> -> . ID <OPTION> <SST2> <MST>

<constr\_body2> -> { <args\_list> } ln <MST>

<args\_list> -> <OE> <list\_args>

<args\_list> -> ∈

<list\_args> -> , <OE> <list\_args>

<list\_args> -> ∈

Yahan class body ki khtm

**Interface CFG**

**Note:-**

**Interface Defintion CFG syntax java based:**

interface InterfaceName {

// Constant variables (optional)

int CONSTANT\_VARIABLE = 100; // By default, variables in interfaces are public, static, and final

// Abstract methods (method declaration without implementation)

void method1();

int method2(String param);  
  
syntax 2:  
  
interface Calculator {

// Method with parameters

int add(int a, int b);

int subtract(int x, int y);

}  
  
hmari language syntax:   
public interface Calculator extends plus , minus , multiply : (  
int var = 100

int add{int a, int b}

int subtract{int x, int y}

void print{}

)

**CFG:**

<interface\_def> → <interface\_header> interface ID <extend\_st\_interface> : ( <interface\_body> ) Not used after left factoring

<interface\_header> 🡪 AM | ∈ Not used now  
  
<extend\_st\_interface> --> extends ID <interface\_rec>

<extend\_st\_interface> -> ∈  
  
<interface\_rec> --> , ID <interface\_rec> | ∈

<interface\_body> → AM <ifb2>

<interface\_body> → DT <ifb3>

<interface\_body> → String <ifb3>

<interface\_body> → ID <ifb4>

<interface\_body> → dict <ifb5>

<ifb2> -> static final <dec> ln <interface\_body>

<ifb2> -> <func\_def\_interface> <interface\_body>

<ifb3> -> ID <ifb3a>

<ifb3> -> [ ] <arr\_mul> ID { <params\_list> } ln

<ifb3a> -> <dec1> ln <interface\_body>

<ifb3a> -> { <params\_list> } ln

<interface\_body>

<ifb4> -> ID <ifb4a>

<ifb4> -> [ ] <arr\_mul> ID { <params\_list> } ln

<ifb4a> -> <dec2> ln <interface\_body>

<ifb4a> -> { <params\_list> } ln

<interface\_body>

<ifb5> -> ID <ifb5a>

<ifb5> -> [ ] <arr\_mul> ID { <params\_list> } ln

<ifb5a> -> <dec3> ln <interface\_body>

<ifb5a> -> { <params\_list> } ln <interface\_body>

<func\_def\_interface>--> DT <fn\_def\_inter2>

<func\_def\_interface>-->String <fn\_def\_inter2>

<func\_def\_interface>--> ID <fn\_def\_inter2>

<func\_def\_interface>--> dict <fn\_def\_inter2>

<fn\_def\_inter2 > -> ID { <params\_list> } ln

<fn\_def\_inter2> -> [ ] <arr\_mul> ID { <params\_list> } ln

<dec> 🡪 DT ID <dec1>

<dec> 🡪 String ID <dec1>

<dec> 🡪 ID ID <dec2>

<dec> 🡪 dict ID <dec3>

<dec1> 🡪 <init\_var> <list\_var> | [ <OE> ] <arr\_size> <init \_arr> <list\_arr>

<dec2> 🡪 <init> <list> | [ <OE> ]<arr\_size> <init\_arr> <list\_arr>

<dec3> 🡪 <init\_dict> <list\_dict> | [ <OE> ]<arr\_size> <init\_arr> <list\_arr>

**Methods of our interface will never be static**

**Func def**

Syntax

Returntype ID { int a,char b, bool c }: (

SST

…

)

<func\_def> 🡪 DT <fnd2>

<func\_def> 🡪 String <fnd2>

<func\_def> 🡪 void ID { <params\_list> } : <body>

<func\_def> 🡪 ID <fnd2>

<func\_def> 🡪 dict <fnd2>

<fnd2> 🡪 ID { <params\_list> } : <body>

<fnd2> 🡪 [ ] <arr\_mul> ID { <params\_list> } : <body>

<params\_list> 🡪 <params> | €

<params> → DT <params2>

<params> → ID <params2>

<params> → String <params2>

<params> 🡪 dict <params2>

<params2> 🡪 ID <list2> | [ ] <arr\_mul> ID <list>

<list2> → , <params> | €

<arr\_mul> -> [ ] <arr\_mul>

<arr\_mul -> €

<body> → ( <MST> <return\_st> )

<SST> → <while\_st> | <dec\_st> | <if\_st> | …

<MST> <SST>  <MST> | €

<return\_st> → € | return <OE>

**Enum Def**

Syntaxes:

enum Direction : (

North,

South,

East,

West

)  
  
enum Direction : (

North = 11,

South =33,

East =56,

West=89

)

CFG

**Old enum\_def**

CFG

<enum\_def> --> Enum ID : ( ID <enum\_list> )

<enum\_list> -> , ID <init\_enum\_def> <enum\_list>

<enum\_list> -> €

<init\_enum\_def> -> = <OE> <enum\_list>

<init\_enum\_def> ->  €

**Final Enum\_def**

<enum\_def> --> Enum ID : ( ID <init\_enum\_def> <enum\_list> )

<enum\_list> -> , ID <init\_enum\_def> <enum\_list>

<enum\_list> -> €

<init\_enum\_def> -> = <OE> <init\_enum\_def> -> €