Innea Classes

```
-> Sometimes we can declare a class inside another class, Such type of
                                                             defficult or doubther
     Classes agre Called Innerclasses.
 -> Ennearclasses Concept Entroduced in Javal. 1 version to fix Guz bugs
    as the past of Eventhandling.
 ) -> But Because of powerfull features & benefits of annex classes Slowly
     Paragonammers Started using even in Diegulasi coding also.
  -> Without existing one type of object of there is no chance of existing
      another type object, then we should go for Inner class Concept
    Epul!-
    Without existing Can object, if there is no change of existing wheel
        Object then we should go for Inner classes.
)
)
   (2) we have to declasse wheel class with in the Casa class.
-)
       class Can
)
        class Wheel
   @:- without existing Bank object there is no chance of existing account
        Object, Hence coe have to define account class inside Bank class.
\bigcirc
         class Bank
```

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class Account

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(3) - A map is a Collection of Key value pairs and each Key-value	
pain is called Entay. Without existing map object there is no	
Chance of existing Entry object. hence interface Entry is define	
•	,
inside Map interface.	
Interface Map	<i>2</i> :
) k
interface Entry	:),
	145
k	,)
	•
)
Note:	.)
-> The Relationship b/w Outer & Poneo classes is not pasient to child	
Relationship. 21 is has-A Relationship.)
Treation of the state of the st)
→ Based on the puopose & position of declaration all inneaclasses)
	•.)
atre divided into 4 types	·)
1) Noormal 1000 Regulan Innen classes.	Э Э
	<i>و</i>
3) Method Local Znnesi classes)
3) Annoymous Inner classes (without class name))
4) Static Nested Classes)
	•
جيد ماهن عاهن	Q
Note:)
from Static Nested Class we an access only static members of outer	O
Class disrectly. But in Normal anner classes we can access both Statie (O
NoN-static members of outer class despectly	O

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Noormal on Regular Inner class:

→ If we declare any named class directly Inside a class without Static modifier, Such type of class is called "Normal on regular Inneral

```
EXUJ:-
    Class Outer
                                    Javac Outer. Java
      Class Inneg
                                                        Outer & Innex. class
                                  Outer-class
                        Java Outer 41
                           R.E: NoSuchMethodEanoa: main
                        Java Outer$Inner
                            R.E. NOSuch Method Expros main.
Ex@] :-
   Class Outer
     Class Inner
     Public Static void main (String [] args)
       S.o.pin ("Outer class main method");
  Javac Outes. Java
  Java Outer L
```

92! Outer Class main method.

Java Outer & Inner <1

%P:- NoSuch Method Esasa: man.

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```
En(3) '.
 -> Boside Bonea Classes we Capit declare Static Members hence
   It is not possible to declase mainumentod & hence we Can't invoke
    inner Class directly from Command powmpic.
       class Outea
        Class Inner
          P. S. V. M (Strong [] ange)
           So pln ("inner class method");
   Javac Outer java
    C.E. - Enner Classes Carit have Static declarations
                                                                          .)
3/02/11:-
                                                                          )
Accessing Inner class Code from Static area of Outer Class:
 E91-
           Class Outer
                                                                          )
             Class Inner
                                                                          )
               P. & V. m1()
                                                                          )
                S.o.pln (" Innea Class method").
                                                                         Ð
                                                                         ()
            p-s.v.m (Storing [] args)
                                                                         1
                                                                         0
                     0 = New Outers;
                                                                         0
              Other Inner & = 0. new 2n New Mayabynataraj. blogspot.com
```

```
i. m1(1)
               Javac Outer · java +
               Java Outer <
               Ennea class method.
     Outer 0 = New Outer();
                                         _ Outer. Inner i = new Outex (). new Inner()
     Outer-Enner i= 0. new Inner1);
       1.m,();
                                         -> New Outer(). New Inner. MIL);
    Accessing Ennew class Code From Enstance Asiea of Outer Class:
       Class Outer
 \Rightarrow
        d
 ٦)
          class Innea
            P. V. mI()
-)
 )
              S. o pln ("Innea Class method");
        G
        P.V.M2()
           Innea i = new Innea ();
           in mill;
()
         P.S.V.M (Storing [] angs)
0
0
           Outer 0 = New Outer();
\mathbb{C}
         4 0. m2():
                                                http://javabynataraj.blogspot.com 286 of 401.
C
```

```
Accessing annea class Code from Outside of outer class &
   1.
            Class Outer
                                                    Class Test
               Class Inner
                                                      P-S-V.M (String [1 args)
                P. v. mi U
                                                        Outer o = New Outer();
                 S-o-pin (" Ennear Class method'),
                                                       Outer. Inner 1 = O. Dew
                                                                Inner();
                                                     1. m1()
                                                                            )
                      According Proper Class Code
Form Static area of Outer class
                                              from Enstance are of
from outside of outer class
                                                   outer class
                                                Innest i = new Inner();
 Outer 0 = New Outer();
                                                i-m,();
Outer. Erner i = 0. new Ennorly
 in mico;
                                               outen o = new Outer();
                                                                            O
                                                                           0
                                                                            http://javabynataraj.blogspot.com 287.of 401.
```

```
- From the Ennear class we Can access all members of outer class
   (both Static & non-static) distrectly.
             class Outer
  <u>- العرك</u>
              Ĵ
                 Static Pot x=10;
                  int y = 20;
                 Class Innea
                    public void mil)
                        3.0.pln (x);
                       S-0. pln(y);
             P-S.v.m (Storing [] args)
               New Outed (). New Enneal). m1();
             10
             20
  With in the 2nner class this always pointing to Cuspent Inner class
  Object.
TO Defen Cunnent Outor class object we have to use "Outer class name.
          Outer class name. This
```

)

0

()

0

0

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```
Class Outer
 81,-
                     int x=10;
                     class Innea
                     þ
                        Pot x=100;
                        Public void mil).
                           int x = 1009;
                          S-0.PIn(x); 1000
                           8.0.pm (this .x); 100
                          Sopho (outer. this.x); 10
                    P. S. v. m (String [] args)
                     new Outer (). new Ennea (1. m, ();
                                                                              )
                                                                              9
                                                                              .)
                                                                              )
-> - too The Outer classes (Top-level classes) The applicable modificers
                                                                              •
  ane
            Public, rdefault, final, abstract, Storictip.
                                                                              )
                                                                              )
   But for the Enner classes &n addition to above the following
                                                                              .)
   Modifiers are also applicable
                                                                             \mathbf{c}
                                                                             0
                                     private
                    Public
                                                                             ()
                                                    = anner classes
                                     protected
                                                                             0
                                      Static
                                                                             http://javabynataraj.blogspot.com
                                                                          289 of 401.
                     Strickfr
```

2) Method Local Ennear classes: -

- → Some-times we can declare a class inside a method such type of classes are called Method Local Ennes classes.
- The main puorpose of method local anner class is to define method Specific functionality.
- The scope of method Local Ennear class is the method in which we declared it. That is from outside of the method we anit access method Local Ennear classes.
-) -> AS The Scope is very Less. This type of Enner classes are most ... Drawely used Enner classes.

```
Exi
          Class Test
∌
              Public void mill
                 Class Znnea
• )
                   public void sum (int x, int y)
                     S. o. pln ("Sum is:"+ (x+4)),
                Innea : = New Innea ();
                 1. Sum (10, 20);
                 1. Sum (100, 200).
i. Sum (1000,2000);
\bigcirc
                 i. Som (10000, 20000);
()
```

0

```
P.S. V. m (Storing [] args)
          Dew Test () · mi();
  9/1- Sum 98 30,
        Sum 15 300
        Sum 36 3000
        SUM 15 30000
-> We Can declasse Inner class either in Instance method or in Static-
   method.
-> If we declare Inner class inside. Instance method then we Can access)
   Both Static & NON-Static Vasciables of outexclass disnectly from that
   Innes class.
                                                                          3
-> 2f we declade Inner class inside Static method then we an access
  Only Static members of Outer Class discelly from that Inner class.
                                                                          9
  والعظ
          class Test
                                                                          .)
          { int x=10;
                                                                          )
                                                                          )
                                  Static is there
            Static int 4=20;
             Public void mil
               class annum?
                                             OID!- 30
                 P. void m2()
                                                                          .
                   S.o. Pln (x)
                    8.0. Pln (y);
                                                                         0
               Pones 1 = new Znner U;
                                                                         0
                 10 m2 ();
                                             http://javabynataraj.blogspot.com
                                                                       291 of 401.
```

```
P.S.v.m (String 17 args)
             new Test(). m1();
            10,20
→ from method Local annex class we Can't access Local variables of
 The method in which we declared it. But if That local vasuable declared
 as the final Then we can access.
 Epi,
             class Test
               PDF 2=10;
                                       if we declare final
                Public void mI()
                 int y=20;
                 Class Ennex®
                  Aublic void mal)
                    System.out.paintin(a);
                    System.out.pointln(y);
                Zonea 1 = new Innea ();
                1. m2();
                                               9p!
                                                    Lo Cal vasuiable y is
             P. S. v. m (Storing or args)
                                                  accessed from with inner
              new Test (). m 1().
                                                  class, needs to be declared
                                                 tina.
```

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```
-> If we declare y as final then we won't get any Compiletime
    Eorose
    % P1. X= 10
       y= 20
24/02/11:
 Consider The following Code
      Class Test
        int x = to;
        Static int y = 20;
        Public void mis
          9n+ i = 80;
          final inti=40;
        Class Inner
         Public void mal)
                                                                        (٠)
                                                                        )
               -> Line O
   )
-> At linea which Vastiables we can access 0 x c
                                                                       1
                                                                       0
  Neater- of declare mic) as Static Then at line O which variables
                                                                       \bigcup
                                                                       \bigcirc
         We an aceass as y, j.
                                            http://javabynataraj.blogspot.com
                                                                     293 of 401.
```

```
3 2f we declare m2() as Static, Then which variable access Lineo we will get C.E. because Phside Inner classes we Can't have Static declarations.
```

```
The only applicable modifiers for method Local Enner classes are 
final, abstract, structfp,
```

```
(3) Annonymus Innear Class:
```

```
→ Some times we Can declare a class without name also. Such
type of nameloss Enner classes abre colled Annoymus Enner classes.
```

This type of Proper classes are most Commonly used type of Proper classes.

```
There are 3 types of Annonymus Ennear classes.
```

- 1. Annonymus Enner class that extends a class.
- a. u " implements an Enterface.

3. " u defined inside method assignements.

Annonymus Enner class that extends a closs:-

```
Public Void taster)

Soph ("faity");

I no more mentiods

Class Test

P-S. V-M (Storing [] anss)
```

)

```
Poplarin p = new Poplarin

{

Public void taste ()

S.o.pln ("sweety");

};

Praste (); Sweety

Poplarin p, = new poplarin);

p. taste (); Saify

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```

- Test\$1.class.
- Dependent class deference Can be used to hold child class object but by osing that deference we can call only methods available in the Padient class & we can't can child specific methods. In the annoyous inner classes also we can define new methods but we can't can these method from outside of the class because, these size we are depending on padient dieference. This methods Just for internal Pudipose only.

Analysis: -

popcosin p = new popcosin();

- -> Just we are Coreating an object of pop Coon class.
- Pop Coan p = new pop Coan ()

4;

We one Creating child class from the popconn & for that Child class we are Creating an object with parient reference.

e u

)

)

Э

()

Ú

```
220
```

```
Class Test
 p.s.v.m (Storing [] args)
   Thosead t = new Thosead()
     P. Y. YUN()
      for (int 1=0; 1<10;1++)
       Sopin ("child thread");
    t. Start 1);
    for (int i=0; i<10) i++)
      S. o. Pln ("main Thread");
```

إلحق إ

Executed Simultaneously & Hence we can't Executed Caract output.

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```
(b) Anonymous Bronzer Class That Poplements an Intexface!
```

```
Class Test
P·S·V·m (Stowing [] angs)
   Runnable of = new Runnable()
    Public void sund
     toa (int 1=0 , K10, 1++)
      S.o.pln ("child thread");
                                is an object of Runnable
                                                          .)
 Thread t = new Thosead (a);
                                                          )
  t. Start();
 for (int i=0; ix to; i++)
                                                         (-
   (S-o.ph (" main Thouad");
                                                         9
                                                          )
                                                          )
                                                         •
                                                         0
                                                         \odot
```

```
(c) Anonymous Inner class that define Enside method assignment.
   Gog -
        Class Test
           Public Static Void main (Stowing [] angs)
                  Thoread (new Runnable)
                             Public void sun()
                              for (int i=0; K90; i++)
                              Soph ("child thread-1");
                               . startu;
            for (90t 1=0; K10; 1++)
              S.o.pln (" main thread -i);
-
```

General class Vs - Anathrymus Inner class:

- -> A General Class Can extend Only one Class at a time, where as Annoymos Ennesiciass also Can extend only one Class at a time.
- -> A General class can implement any no of Interfaces where as Annoymus Ennesiclass Can implement only one interface at a time.
- → A Genesial Class Can Extend another Class & Can implement an interfale Simultaneously. Where as Annonymus Enner class Can extend another on Can implement an interface but not both Simultaneously.

) Static Nested classes: -

- -> Some times we an declara Inner class with Static modifier Such type of Three classes are called Static Nested classes.
- → In the nonmal Inner class, Inner class object always associated With outer class object.
- -> ie, with out existing outer class object, There is no chance of existing) annes class object.
- -> But Static Mested Class object is not associated with Outerclass object, • The with out existing outen class object there may be a chance of ુ Oxisting Static Nested class object. 9

Ep! class Outen Static Class Nested

Public Void mil)

S.o. pin ('Static Nested class method');

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)

)

)

```
Public Static void main (Storing [] args)
               Outen. Nested n = new Outer. Nested ();
                D-101()
  -> With in the Static Nested Class we Can declasse Static Members
     including main() also. Hence it is possible to invoke Dested Class
     disjectly from Command perompt.
     CAI.
             Class Outer
-)
               Static Class Nested
                 Public static void main (Staing [] args)
 )
                   8-0-pin ("Static Nested class main method");
\mathbf{C}
-)
               Public void main (Storing [] args)
                S. o. pln (" Outer crass main method");
)
-_)
      Javac Outer Java &
       Java Outer +1
         Outer class man metted
()
\bigcirc
      Java Outer$Nested
C
          Static Nesked Class main method
                                              http://javabynataraj.blogspot.com 300 of 401.
```

U

```
-> from the Noomal Znnes class both Static & NOW-Static members
     but from, Static Nested class we can access only static members
     other class disrectly.
 Cx1_
         class Outer
           int x=10;
          Static inty = 20,
           Static class Nested
             P. V. MI U
              S.o.pln(x); * ----> C.E .- Non-Static variable x can't be
               S.o.pln (y); -
                                        The fever Ced from Statis Content
                                          Static Nested Class?
            Normal Ennearciass
             Zonesiciass
                                             Static Nested Class
   Ennear class object is always
                                        D Static Nested Class Object is not
   associated with Outerclass Object.
                                         associated with Outer class object,
                                         i.e, without existing Outer class object
   ive without existing outcrows object
  There is no chang of existing Emperchase
                                         these may be a chance of existing
                                                                            ٦)
                                         Static Nested class object.
                                                                            ( ا
3 Enside Noamou Ennea class we Can't
                                         2) Enside Static Nested Class we
                                                                            ()
 declare Static members
                                                                            ٩
                                           Can declasse Static members.
                                                                            O
3) Enside noormal Ennea class we can't
                                         3) Enside Static Nested Class we Can
                                                                            0
                                          dectatre manc) & hence we can invoke
   declare main () and hence 9th 15 not
```

Possible to invoke innocuous directly from

States Nested Class directly from http://javabynataraj.blogspot.copp.om/21 of 401.