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Innea Classes

```
-> Sometimes we Can declare a class inside another class, Such type of
                                                            defficult or doubtree
     Classes agre Called Innegiclasses.
 Innericlasses Concept antroduced in Javal. 1 version to tix GUI bugs
    as the past of Eventhandling.
 ) -> But Because of powerfull features & benefits of annex classes Slowly
     Paragarammers Started Using even in Diegulaan coding also.
  -> without existing one type of object if there is no chance of existing
     another type object, then we should go foor 2nnes class Concept
   Epul!-
    without existing Casa object, if there is no change of existing wheel
       Object then we should go for Enner classes.
)
   @ we have to declase wheel class with in the Casa Class.
- )
       class Can
)
        class Wheel
  1: - without existing Bank object there is no chance of existing account
        Object, Hence coe have to define account class inside Bank class.
        class Bank
          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	
Chang of existing Entry object hence interface Entry is define	,
Poside Map interface.	. }
·	þ
interface Map	:. <i>y</i>
	Ì
interface Entry	()
9 1	,
b g	` } }
	<i>y</i>
Note:)
-> The Relationship blw Outer & Prones classes is not passent to child	
Relationship. 21 is has-A Relationship.	ુ
	9
Based on the purpose & position of declaration all innerclasses	•
alle divided into 4 types	•
1) Noormal 1000 Regulari Zonesi classes.	9
)
2) Method Local Inner classes	•
3) Annoymous Inner classes (without class name)	
4) Static Nested Classes	
	•
	9
Note:)
from Static Nested Class we an access only Static members of outer	O
Class districtly. But in normal annex classes we can access both Static (O
NON-static members of outer class despectly	O
Ĵ-	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 Innerly

```
EX(1):-
        Class Outer
                                          Javac Outer. Java
          Class Innea
                                        Outer-class
                                                               Outer & Innex. class
                              Java Outer -1
                                 R.E: NoSuchMethodEssaca: main
                             Java Outer$Inner
                                  R.E. Nosuch Method Easton : main .
\Rightarrow
   Ex@1 :-
       Class Outer
         Class Inner
         Public Static void main (Strong [] orgs)
           S. o. Pln ("Outer class main method");
      Javac Outes. Java
      Java Outer _
```

1/2! Outer class main method.

%P:- NoSuch Method Casaa: man.

Java Outer & Imes ~1

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```
En(3) 1,
-> Enside Ennea classes we can't declase Static members hence
   It is not possible to declare mainumethod & hence we Can't invoke
   inner Class directly from Command powmpt.
  class Outea
        Class Inner
          P. S. V. M (Strong [] angs)
          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 agree of Outer Class:
                                                                        -
 E01-
           Class Outer
             Class Innes
                                                                        •
               P. & V. m1()
                                                                        )
                S.o.pln (" Innea Class method").
                                                                        0
            p-S-v m (Storing [] args)
                                                                        ③
              Outer o = new Outers;
                                                                        0
              When Inner \pm = 0. New 2n New Mayabynataraj.blogspot.com
```

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```
1. m1(1)
               Javac Outer · java +
               Java Outer <
               Ennea class method.
     outer 0 = new outer();
                                         -> Outer. Innea i = new Outex().newInner().
     Outer . Enner i = 0. new Inner 1);
      1.m,();
                                            New Outer(). New Innest. MIL);
    Accessing Enner class Code From Enstance Agrea of Outer Class:
      Class Outer
3
 ٦)
         class Innea
 )
\odot
            p. v.mi()
-)
• )
              S. o pln ("Innea Class method");
        P. V. Ma()
          Innea : = new Ennea();
           i. mil);
()
()
         P.S.V.M (Storing [] angs)
\bigcirc
0
          Outer 0 = new Outer();
\mathbb{C}
         5 0. m2();
                                                http://javabynataraj.blogspot.com 286 of 401.
```

```
Accessing annea class Code from Outside of outen class &
   1.
            Class Outer
                                                  Class Test
              Class Inner
                                                    P.S.V.M (String [1 args)
                P. v. m1 ()
                                                      Outer 0 = Dew Outer();
                S-o-pin ( " Ennear Class method').
                                                     Outer. Inner 1 = O. Dew
                                                              Inner();
                                                    i. mil)
                      According Proper Class Code
form Static area of Over class
                                             from Enstance are of
         (01)
from outside of outer class
                                                  outer class
                                               Inned i = new Inner();
 Outer o = new Outer();
                                               1.m,();
Outer. anner i = 0. new annorly
                                                                          in mill;
                                                                         o = New Outer()
                                                                         1
```

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```
- From the Princer class we Can access all members of outer class
      (both Static & non-static) disrectly.
                class Outer
     - ال<u>انك</u>
                Ĺ
                    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 Outer (). New Enneal). m, ();
                10
                20
)
     With in the Zinner class this always pointing to Cuspient Inner class
    Object.
   To Diefeon Cuononient Outor class object we have to use "Outer class name.
            Outer classname. This
```

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)

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```
- اه
               Class Outen
                d
                  int &=10;
                  class Innea
                  ð
                     int x=100;
                     Public void MIU.
                        int x = 1000;
                        S-0-PIn(x); 1000
                        8.0.pm (this.x); 100
                        Sophowher. this.x); 10
                  P. S. v.M (String [] args)
                   new Outer (). new Prnea (1.m, ();
                                                                          9
                                                                          .)
                                                                          )
                                                                          )
  too The Outes classes (Top-level classes) The applicable modifiens
                                                                         a
ane
          Public, <default>, final, abstract, Strictfp.
                                                                          )
 But for the Enner classes &n addition to above the following
                                                                         .)
 Modifiers are also applicable
                                                                         0
      and only cross
                                                                         0
                                  porivate
                 Public
                                                = Inner classes
                                   protected
                                                                         0
                                   Static
                                            http://javabynataraj.blogspot.com
```

2) Method Local Ennear classes: -

- -> Some-times we can declare a class inside a method such type of classes are called Method Local Ennew classes.
- -> The main puorpose of mother 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 Can't access method Local Ennear classes.
-) -> AS The Scope is Very Less. This type of Enner classes are most) Granely used Enner classes.

```
Class Test
٥
_)
              Public void mIL)
)
)
                 Class Ennea
                   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();
  9P1-
        500 2° 0002
        Sum is 300
         Sum 35 3000
         SUM 15 30000
-> We Can declasse Ennes 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.
                                                                            7
-> If we declade Inner class inside Static method then we Can access
  Only Static members of Outer Class discelly from that Inner class.
                                                                           9
  والعظ
           class Test
                                                                            .)
                                                                            )
             int x=10;
                                                                            )
                                 , Static is there
            Static int y=20;
                                                                           •)
             Public void mil
                                                                            )
               class annum?
                                              old 1- 30
                 P. void m2()
                                                                           \dot{\phantom{a}}
                    S.o. Pln (x)?
                                                                           ()
                    8.0. Pln (y);
                                                                           0
                                                                           0
               Ponen i = new Znew U;
                                                                           10 m2 ();
                                              http://javabynataraj.blogspot.com
```

```
P.S. v.m (String 17 args)
               new Test (). mi();
-> from method Local Ennear Class we Con't access Local variables of
   The method in which we declared it. But if That local vasuable Gedared
   as the final Then we can access.
   Epi,
              class Test
                 Pot x=10;
                                        if we declare final
                 Public void mI()
                   int y=20;
                   Class Ennexe
                    Aublic voia mal)
                      System.out.paintin(2);
                      System.out.paintln(y);
                  Zonea 1 = new Innea ();
                  1. M2();
                                                 9p!
                                                       Lo Cal vaouable y is
              P. s.v.m (Storing 17 angs)
                                                     accessed from with inner
                New Test (), m 10.
                                                    class, needs to be declared
                                             http://javabynataraj.blogspot.com 292 of 401.
```

```
-> If we declarie y as final then we won't get any Compiletime
    Enron.
    9/P1. X= 10
        y= 20
24/02/11.
 Consider The following Code
       Class Test
         int x = to;
         Static int y = 20;
         Public void miss ()
           9n+ 1 = 80;
           final int 1=40;
         Class Inner
          Public void mal)
                                                                               ٦
                                                                               )
                 \longrightarrow Lneo
-> At linea which Vasiables we Can access
                                                                               ٦
                                                                               J
                                                                              \mathbf{O}
  Note: If declare mic) as Static Then at line O which variables
                                                                              \bigcirc
                                                                              \bigcirc
         We an access 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 Phride Inner classes we can't have Static declarations.
```

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

type of nameless Enner Classes able Called Annoymus Inner classes.

This type of Brness classes agre most Commonly used type of Brness classes.

There are 3 types of Annonymus Inner classes.

1. Annonymus Enner class that extends a class.

a. " implements an Enterface.

3. " u defined inside method assignments.

Annonymus Ennem class that extends a class:-

```
Exo. Class popcoon

Public void taster)

So pro ("falty");

// 100 more mentiods

Class Test

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

)

-)

)

```
Popcoan p = new Popcoan

Public void tasker

S.o.pln ("sweety");

y;

P-tasker; sweety

Popcoan p, = new popcoant;

p. tasker; saifullogspot.com 294 of 401.
```

Note:

- Test\$1.class.
- Pasient class steference Can be used to hold child cross object but by osing that she ference we can call only methods available in the Pasient 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 pasient steference. This methods Just for internal Pusipose only.

Analysis: -

popcosin p = new popcosin();

- → Just we are Coreating an object of Pop Coon class.
- PopCoan p = new popCoan()

زوا

We asso Careating Child class from the popcoun & for that Child class we asso Careating an object with parient dieference.

 \mathbf{O}

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)

```
2×1
```

```
class Test
إلحق.
             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");
   In the above Example both main & child threads will be
  Executed Simultaneously & Hence we can't Executed exact output.
```

```
(b) Anonymous Ennear Class That Poplements an Intexface!
 81-
           Class Test
          P·S·V·m (Stowing [] aurgs)
              Runnable of = new Runnable()
               Public void sunu
                for ("nt "=0 " K10", "++)
                 S. o. Pln ("child thread");
                                              - It is an object of Runnable
                                                                     .
            Thread t = New Thomead (91);
                                                                     )
             t. Start();
                                                                     .)
            for ("n+ 1=0; "x to; "++)
                                                                    (-
              S-o.ph (" main TKouad");
                                                                     -
                                                                     )
                                                                    (
                                                                    )
                                                                    0
                                                                    0
```

```
(c) -Anonymous Inner class that define Enside method associament
   Gpg -
          Class Test
            Public Static Void main (Stowing [] args)
               Dew
                     Thoread (new Runnable)
                                 Public void sun()
                                 for (int 1=0; K90; i++)
                                  Soph ("child thread-1");
                                  . startu;
             for (int i=0; K10; i++)
                S.o.pln (" main thread -i);
-)
\dot{\cdot}
-)
\dot{\mathbf{C}}
```

General class Vs Anathoymus anner class:

-> A General Class Can extend only one class at a time, where	
as Annonymos Enneschass also Can extend only one Class at a tin	se.
-> A General Class Can implement any no-of Interfaces where as	***
Annoymus Ennesiclass Can implement only one interface at a time	و الم
→ A Genesia Class Can Extend another Class & Can implement an	***
interfale Simultaneously. Where as Annonymus Enner class Can exten	d }
another on Can implement an interface but not both simultaneously	
)Static Nested classes:-)
-> Some times we an declara Toner class with static modifier)
Such-type of Three classes are called "Static Nested Classes".	.) a) :
→ In the notional Inner class, Inner class Object always associated)
Costh outer class object.) :)
- ie, with out existing outen class object, There is no chance of existing	9
anner class object.	C
-) But Static Nested Class object is not associated with Outer class obj	ect,
i.e with out existing outen class object there may be a chance of	9)
existing Static Nested class object.	3
Epi- class Outen	\mathcal{O}
d	9
Static Class Nested	ပ ပ
Public Void mill)	0
Sopin ('Static Nested class method'); http://javabynataraj.blogspot.com	0
http://javabynataraj.blogspot.com	299 of 401.

```
Public Static void main (Staing [] args)
            Outen-Nested n = Dew Outer-Nested ();
             りっろこ
-> With in the Static Nested Class we Can declase Static members
  including main() also. Hence it is possible to invoke Dested Class
  dissectly from Command perompt.
          Class Outer
           Static Class Nested
              Public state void main (Staing [] args)
                8-0-PIn ("Static Nested class main method");
            Public Watatic void main (Storing [] args)
             S. o. pln (" Outer crass main method");
   Javac Outer java &
    Java Outer +
```

Java Outer\$Nested & Static Nested Class main method

Outer class man method

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```
-> - From the Noomal Znner class both Static & NOW-Static members
     but from, Static nested class we can access only static members
     of outer class disrectly.
 CXI_
         class Outer
            int x=10)
           Static inty = 20,
           Static class Nested
             P. V. MI U
              8.0.pln(x); x ---
                                  -> C.E :- NON-Static Variable & Carit be
               S.o.pln(y); -
                                         The fever ced from Static Charles Needed.
                                           Static Nested Class?
             Normal Innerciass
              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, wiltout existing Outer class object
   ire without existing outerclassobject
  There is no chang of existing anner char
                                         these may be a chance of existing
                                                                              J
                                          Static Nested class object:
                                                                              ( ۽
& Enside Noamou Enneaclass we an't
                                          2) Enside Static Nested Class we
                                                                              1
 declare Static members
                                                                              ۹
                                            Can declare Static members.
                                                                              0
3) Enside noormal Ennea class we can't
                                         3) Enside Static Nested Class we Can
                                                                             0
                                           declare main () & hence we can invoke
   declare main () and hence it is not
                                           Static Nested Class directly from
 Possible to invoke inner class directly toom
```

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