DN 2: Differences between static fields, find fields and methods in Java:

area we are	2 to pull of	
Static fields	Final fields	Meho ds
Belong to the class,	value connot be	Desine actions pentorme
sharud by all instances	Change d once assigned	bjobjects.
Accessed using	Must be initialized at	Called Object. me hod Nams ()
className. fieldName on	declaration on in	or, class Name. metro d Name ()
Object, field name	Constructor mos	(if static)
can be modified	Cannot be changed after initialization	an' be over rudden
		(unless final)
Stored in class memory, not pen object	Exists per Instance (unless static films)	Stored in metrod area
Shared among all Objects	Final Static makes it a constant	final method connot be overridden.
		be overriden.
	Exists per instance	Can be Static, final, on
	gast usa di	overru den
	[93]	

What happens when we access a static tield/metrod Using an Object:

Static fields and methods belong to the class.

Not to individual Objects. However, Java allows

accessing them through an Object, but it

internally rudiructs the call to the class.

There is no difference in execution.

Ho Weather we call Obj. Static Method(); on

Class Name. Static Method(); Jave treats them the

Same interinally. There is no

But if multiple objects exist, calling a Static field / method was an object might mis load others in to twinking it's tied to the object. able it's actually shared across all instances.

Cole:

classed Brample floiting of tout griev bossons A

Static in count = 10; 1 static field months to topolo

Static void displayor some boilbour some System. out. printin ("static method called");

Final static makes it a final notice of corne Public class test Static ? static

Aublic static void main (Strong[] arros) {

(host sides warn

Example obj = new Example();

System. out. prointly ("Count (via Object): "+ Obj. count);

2000 Obj. display(1)

System out prointin (" count (via class): " + Example, Count);

Frample display (); 10 Agrand grant (1) 22900 3 Output! J. Count (via Object): 10) with the Mornotti Static metrod called metrody est meet their

Count (via class): 10 les porte empresons

static metrod Called. May solve

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```
31 impord Java. Util. Samon;
Rblic class Factorion_3 {
```

Public Static long fact (int n) {

long f= 1;

for (int i= 1; iz= n; i++) {

f # = i;

tatunfind on allang.

3

Public Static boolean CheckFactorion (int mm) {

int Org Nom = num;

long sum = 0; while (num > 0) {

int te = nom 1.10;

sum = sum + fact(n);

num = + mi num /10;

Jeturn sum == Org Num;

3

Public static void mark (Strong args []) {

Scannere 30 = new Scanner (System. in);

System. at. print ("Enter the lover bound of the Mange:"); int 16 = SC. Mext Int (1);

System. at. Proht ("Endere the Upper bound of the Mange: "); int Ub = sc. next Int();

boolean Cheth Check = false;

System. at Proitte ("Factorion numbers in the Mange: "); for lint felb; iz= ub ; iet) for nound and each of it (Checkfactorum (i)) Sprol skote side System - out - print In (i); = = } gral 2 Check = trug in the (NEXI LE) This) That (i= # } if () Check) f System. out . Prohatin ("No factorion numbers found in the given Mange . "); Public static boolean checkfactorism (in more se. close (1); int orgnon = num. while (non 70) { int the win the wow = 101/ was rett = was

Puplic static ways analy (strong angs []) } Scanner Se - Man Scanner (Estim. 12); Stelen . Out . Pront ("Enten the land bord of the tra

int 16 = 50, MICH INT (1)

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41 Difference Among class, Local and Instance Variables;

Class Varciables (Static)	Instance Variables	Local Varuables
Declared with the Static key word inside a class.	Declared inside a class but outside inside methods / constructors.	Declared inside a method, constructon, on block
Shared among ell objects of the class	Franch Object. hat its own capy.	Only accessible within the method where it's die land
stored in class memory (Static area)	Stored in heap memory	Stored in stack memory
Com be accossed Using elassName. Variable on an object.		connot be accessed outsite the method.
Example: Static int Cht;	Frample: Int cyl;	Example 3 gift temp=5;

A significance of this regulardie must the state

The twis Key word reserves to the Convent object of a class. It is used to differentiate instance variables from local variables when they have the same name.

It improves cole readability and avoids variable shadowing, this keyworld makes object handling more chan and consistent in Jana. It is mainly used fore bettern object mederance management inside a class.

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· class Example & survey survey (such addition of early) im n; 11 Instance variable void setx (int x) {

Frank Object; had it's Dolf agocal

In the example 'twis. " referres to the instance variable 'x' is the local variable. memory (state ance)

import Jana . Util. #;

Public class Array_ Sum_ 5 {

Public Static int annay sum (int [] annay) {

int sum = 0;

forcint num: annay 18 824 sint to enorthurgis

The twis key word presents to the min Extense of all at a

returns sum; the distribute of born is to seed

Public Static void main (Strung[] arros) {

Sanner sc = new Scanner (System, in);

System out print (" Enter the sinze of the array: ")

bow theomist he sc. next Int (district 2000 6 mo mod)

int[] a= new int[n];

being brance some some toolde method mob

or chall

grand among all

Con be accepted with

deports of the class own copy

fore (int 1=0six nsitt) { O[i] = sc. next Int();

12/1/200

Local very ble : of Declerad Inside a forted

int result zarmay _ sum (a);

System - out · Probetto (M The sum of the armayis: " 4+ result); 10 Holy Sc. darce beind ab aldours of indivisor hard

number on constitution is called a local work tobe.

61 Access modifiens in Java desine the visibility and accessibility of classes, methods and to & Hoold with

There are to form of type of Java access modifiens: art want british the

Tet UNES allow for forestices.

1. Arivated

2. Public

3. Default soisal burnelson & side word anotent

Compatuson of Public, Pravato and profected modifiens. Accessible within Accessible by Accesible 1 Accessible everywhere Modifiem within class package subclus NO Private Yes NO Tes Priotected WO Yes tes-Yes public Tes Yes Yes.

Disserent type of variable in Java:

Loral Varuable: & Declared Inside a method/

Local variable: A variable defined within a block on muchod on constructor is called a local variable.

The scope of these variables exists only within the block on method. The Local variable is cruded at the time of declaration and destroyed after exiting from the block on when the call testurns from the function.

Instance variable: Doctored inside a class (but outside methods). The scope of these variables exists as long as the only with specific to an object. It exists as long as the object exists.

Static variable: declared inside a class, with static beautiful. Shared among all objects. Exists as long as the class 15 baded.

Frample:

class Examples

static int class van = 10; // static

int instance van = 20; // Instance

void metrod (15

int local vance = 30; // Local

System. out. prontln ("Local: " + local van);

?

Il import Java. util. +;

Public class Root-tind 72

Sanner (System

Scanner sc = new Scanner (595 temmin)

dable (a, b, c; to the note) mon. we made for

System. out. Prund ("Enten coesticients a, b, and c: ");

361 == (1) X (1) == (1) }

import : Jana, vtil #

Malic chara du 8 &

a = sc. met Darble (); 0= 100 0 mother to

b = sc. next Doublec 1;

C= Sc. next Double(1;

corble de Cb+d-4+a+c);

if(1)0){

double 100+1 = (-b+ Math. 99rt(d))/2; double 100+2 = (-b-math- 99rt(d))/2;

double rus = Mah min (roos, Most 2);

System. Out. Probable ("The smoothert positive teast is: " + mes). elu s 314455 (200) System at Auxilla ("No real proof exists,"); ing justones have seen the see Sc. dose (1) (or working) the 375 fem. out. proutly tiled: " I down to import. Java, vtil. +; Public class gn_8 { Import Jose Util. A; Public static vois main (strong[] arigs) 3 Scanner se = new Scanner (System. Th); System. OVA. Brint ("Enter the String: ") is don't Strong s= Sc. nexalize (1) more too motor

System. Ova. Print ("Enter the String; "); sides string s= Sc. nexalized intal") more that most and sides into letter = 0, digit = 0, Space = 0; other > 2 = 0

it (s. Charatli) = = ''') {

Space + +'',

3. else if (s. Charatleli) >= '0' (P) si chat At (i) | Zi='91) }

else if (s. Charatleli) >= '0' (P) si chat At (i) | Zi='91) }

digit + +';

else (letterset) dans de letors aldob

do ble rus - Mate min (roal, 12001 2);

System. Oct. pointh ("Lether: " + Lettern",

System. oct. pointh ("Whospan: " + spane);

System. oct. pointh ("b); sit: " + dry+);

sc: clotter;

7

10 Difference between Static and Non-Static Members;

Estem and we waster Costop - the most of &

I Belong to the class, sharred by all objects.

Static Members (Static)

2. Stored in class memory (static army

3. Does not require an object

4. Cannot use "twis" key world

5. Cannot be Overeri den (bt can be hidden)

6. Example: Static int count;

Non-Static Membery

2. Belong to individual Objects, each object has its own lopy.

e-Stoped in heap memory

3. Requires an object to access.

15. Can vie tus" be givord.

5. Canbe overridden in subclasses.

TURAUN

7. Example: intage

i bid in sit is

NON. ALTE ALL

Ja- 20,000

Example:

Class Example & Static int statiction = 10; 11 Static members int honstate Van= 20; 1 Nonstatic member

Static Void Static Method (18 Stitem out . Wintln (ds fatic Method "+ static van);

Void nonStatic Method (15 System - ort. print In C" Non- static method = 1'7 non Static

Adora to individual { Public class Text !

2 Belong to the class shorted Roblic Static void main (Strong[] eurogs) { System. at. Probath (Example. Static Vari); Example, Static Mehre d(1;

Example Obj = new Example (1) Søstem out. printa (Obj. non static Var); obj. ron Stube Mehrs 2 (2)

OUAPUT:

6 Francis Statis int county 16 Static Mehod: 10 Won- static mehrs: 20

Code:

import Java Wit. "

Public class pollindrome_10{

Ablic studie void main (Straing) arisi) ?

Samen se = new Scarmen (Systemin);

Statem. out. print (" Enten the strong: ");

Strong n = "";

for (int i=5, lengh(1=1;17=0', i--){

Fit = S. ChanAt (i) in lower of of corne to

booken cherk = true;

for (inti=0; izs.dougher; i++){

if (s. ChinAt (i)) = 17. chanAt(i)) {

chen = false;
3 3

to capsulation: In appealation is it (chick) system out prointly [" Padiharrome"); de Søsten of printe 1" Not Pallindrome");

Sc. dose ();

trace of Anstract clarges

Albert destruct double areall);

SAZYEW - ON THE BY IN IR W 24EBES

Abstraction: Abstraction is a process of hild hilling the implementation details and Shaving only functionality to the user.

Abstruct class: Java abstract class is a class that can not be instantiated by itself, it needs to be subclassed by another class to Use its Properties.

An abstract class is declared using the abstract reguond in its class desirition.

Encapsulation: Enapsulation is a process of binding data and method to gether in a single Unit, providing controlled access to data.

Example of Ahstract Classes:

Public abstruct class Share & Riblic abstract double area(); Public Void displayers System. out. Proint In ("This is a shape.");

Class Programmer & Pravale Straig name;

Roblic String gelName() { reform name; }

Roblic void setName() france; rume) { dws. name = name; }

3

Public class Encap {

Public static void mais (straig [] angs) {

Priogrammen P = new Priogrammen (1)

P. Set Name ("Mahmidul");

System at prutala ("Name => " + Pigetrame(1);

Chair Big Integer to chower (Big Integer in) & t

Abstract Class VS Intervace:

Abstract dass

1. Can have both abstract and concrete prehod

- 2. Supposets partial abstraction
- 3. lan have Constructors.
- 9. Allows instance variables
- 5. A class can extand only one abstract class
- C. Cun have Static and non-static
 - 7. Methods Canhane any access

Interface

1. con home only abstract

e-suprorts full abstraction

3. Cannot have constructors.

u-variables are public

Static, and Sthel by defelt.

5. A class can implement multiple intonfaces.

- 6 Can have only static methods
- 7. Methods are Ablic by

14 significance of BigInteger in Java;

The Big Integer Class in Java is Used to handle very large numbers that Connot be Stored in int or long. It supports anthmetic operation. It is

Sond in Java mah Big Integer.

Cole: Import. Jane. VIII. of Golf law of normangung import Jona-mach. Big Integer ; 10M2) with 102 9

Rusic eless Factorial-big Int-14 {

State Big Integer factorial (Big Integer n) { Big Integer fact = Big Integer. On E;

for (Big Integen i = Big Integer ONE; i. Compane To (h) <=0)

1 = 1. add (Big Integer + ONE)) { today of mo 1 = 1. ade (1995).

1 = 1. ade (1995).

Sact. mutiply(i) god way at anona.

gratures; return fact; Public Static void main (Stratg [] array 1

Schnen Sc - New Scannen (System-In)

System. Out PRINT ("Enten the non ben: ");

Big Integer nom = Sc. Next Big Integen(1) Solden , out . Printle ("Factor of "I nun + " is . In" + factorid (not)