

# Dynamic Web Development in JSP

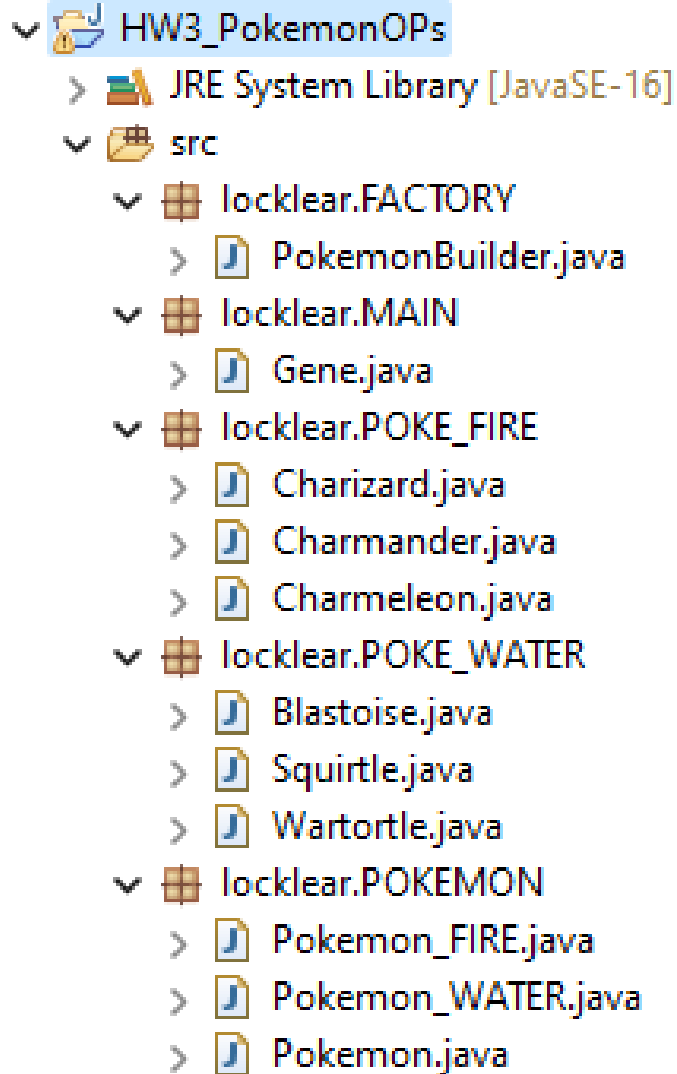
## Spring 2024



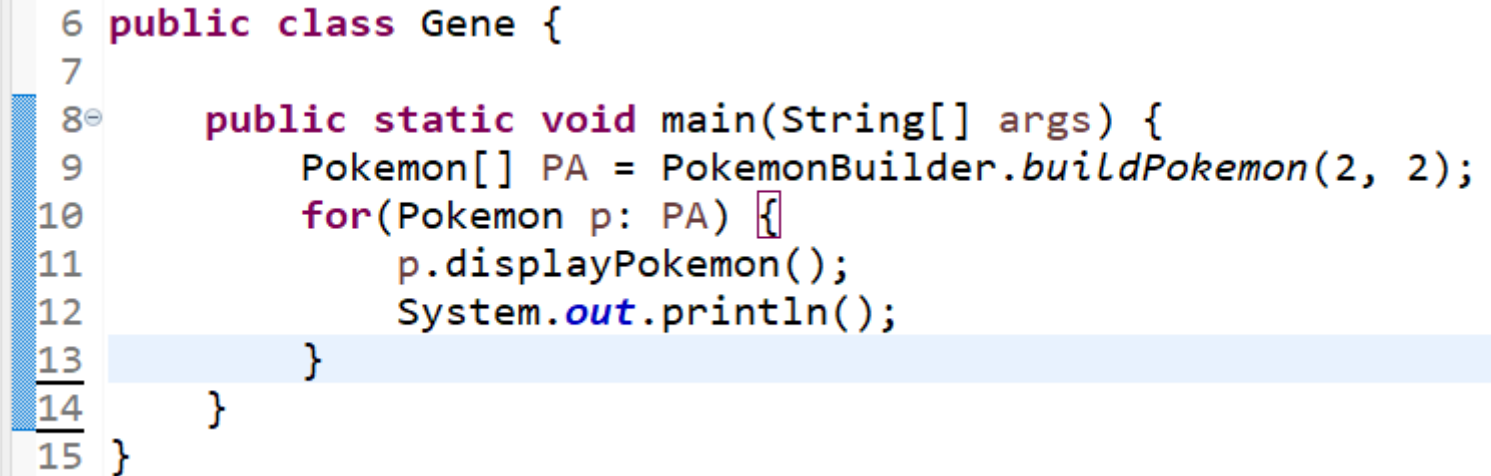
## EX 6: OOP Programming

Professor Gene Locklear

# Program Structure



```
HW3_PokemonOPs
├── JRE System Library [JavaSE-16]
├── src
│   ├── locklear.FACTORY
│   │   ├── PokemonBuilder.java
│   │   └── locklear.MAIN
│   │       ├── Gene.java
│   │       ├── locklear.POKE_FIRE
│   │       │   ├── Charizard.java
│   │       │   ├── Charmander.java
│   │       │   └── Charmeleon.java
│   │       ├── locklear.POKE_WATER
│   │       │   ├── Blastoise.java
│   │       │   ├── Squirtle.java
│   │       │   └── Wartortle.java
│   │       └── locklear.POKEMON
│   │           ├── Pokemon_FIRE.java
│   │           ├── Pokemon_WATER.java
│   │           └── Pokemon.java
```




```
6 public class Gene {
7
8     public static void main(String[] args) {
9         Pokemon[] PA = PokemonBuilder.buildPokemon(2, 2);
10        for(Pokemon p: PA) {
11            p.displayPokemon();
12            System.out.println();
13        }
14    }
15 }
```

Create your Program Structure and main method EXACTLY as shown.



Use the information shown on Slides 2 and 3 and your knowledge of inheritance and polymorphism to complete a solution that has an expected output formatted as shown on slide 10.

# Water Pokemon

Squirtle #0007



When it retracts its long neck into its shell, it squirts out water with vigorous force.

Versions:  

Height  
1' 08"

Weight  
19.8 lbs

Gender  
♂ ♀

Category  
Tiny Turtle

Abilities  
Torrent


Type  
Water

Weaknesses  
Grass Electric



Stats

HP	Attack	Defense	Special Attack	Special Defense	Speed
30	30	40	45	60	3

Wartortle #0008



It is recognized as a symbol of longevity. If its shell has algae on it, that Wartortle is very old.

Versions:  

Height  
3' 03"

Weight  
49.6 lbs

Gender  
♂ ♀

Category  
Turtle

Abilities  
Torrent


Type  
Water

Weaknesses  
Grass Electric



Stats

HP	Attack	Defense	Special Attack	Special Defense	Speed
40	40	50	60	75	4

Blastoise #0009



It crushes its foe under its heavy body to cause fainting. In a pinch, it will withdraw inside its shell.

Versions:  

Height  
5' 03"

Weight  
188.5 lbs

Gender  
♂ ♀

Category  
Shellfish

Abilities  
Torrent

Type  
Water

Weaknesses  
Grass Electric

Stats

HP	Attack	Defense	Special Attack	Special Defense	Speed
50	50	60	75	105	5


Squirtle Characteristics			
SP Number = #0007			
Height = 1.08		Hit Points = 30	
Weight = 19.8		Attack = 30	
Category = Tiny Turtle		Defense = 40	
Type = Water Pokemon		SP Attack = 45	
Weaknesses Grass, Electric		SP Defense = 60	
		Speed = 3	

Wartortle Characteristics			
SP Number = #0008			
Height = 3.03		Hit Points = 40	
Weight = 49.6		Attack = 40	
Category = Turtle		Defense = 50	
Type = Water Pokemon		SP Attack = 60	
Weaknesses Grass, Electric		SP Defense = 75	
		Speed = 4	



Blastoise Characteristics			
SP Number = #0009			
Height = 5.03		Hit Points = 50	
Weight = 188.5		Attack = 50	
Category = Shellfish		Defense = 60	
Type = Water Pokemon		SP Attack = 75	
Weaknesses Grass, Electric		SP Defense = 105	
		Speed = 5	

# Fire Pokemon

Charmander #0004



It has a preference for hot things. When it rains, steam is said to spout from the tip of its tail.

Versions:  

Height  
2' 00"

Weight  
18.7 lbs

Gender  
♂ ♀

Category  
Lizard

Abilities  
Blaze


Type  
Fire

Weaknesses  
Water Ground Rock



Stats

HP	Attack	Defense	Special Attack	Special Defense	Speed
30	35	30	60	45	40

Charmeleon #0005



It has a barbaric nature. In battle, it whips its fiery tail around and slashes away with sharp claws.

Versions:  

Height  
3' 07"

Weight  
41.9 lbs

Gender  
♂ ♀

Category  
Flame

Abilities  
Blaze

Type  
Fire


Weaknesses  
Water Ground Rock

Stats



HP	Attack	Defense	Special Attack	Special Defense	Speed
40	55	40	80	60	60

Charizard #0006

Charizard



It is said that Charizard's fire burns hotter if it has experienced harsh battles.

Versions:  

Height  
5' 07"

Weight  
199.5 lbs

Gender  
♂ ♀

Category  
Flame

Abilities  
Blaze

Type  
Fire Flying

Weaknesses  
Water Electric Rock

Stats

HP	Attack	Defense	Special Attack	Special Defense	Speed
50	85	60	105	75	80

Charmander Characteristics	
SP Number = #0004	
Height = 2.0	Hit Points = 30
Weight = 18.7	Attack = 40
Category = Lizard	Defense = 30
Type = Fire Pokemon	SP Attack = 60
Weaknesses Water, Ground, Rock	SP Defense = 45
	Speed = 4

Charmeleon Characteristics	
SP Number = #0005	
Height = 3.07	Hit Points = 40
Weight = 41.9	Attack = 40
Category = Flame	Defense = 40
Type= Fire Pokemon	SP Attack = 75
Weaknesses Water, Ground, Rock	SP Defense = 60
	Speed = 5

Charizard Characteristics	
SP Number = #0006	
Height = 5.07	Hit Points = 50
Weight = 199.5	Attack = 50
Category = Flame	Defense = 50
Type = Fire Pokemon	SP Attack = 105
Weaknesses Water, Ground, Rock	SP Defense = 75
	Speed = 6

# Pokemon Class

## Pokemon

-String species  
-String spNumber  
-String type  
-double height  
-double weight  
-String category

-int hitPoints  
-int attack  
-int defense  
-int spAttack  
-int spDefense  
-int speed

Pokemon(String species, String spNumber, String type, double height, double weight, String category, int hitPoints, int attack, int defense, int spAttack, int spDefense, int speed)

+ displayPokemon(): void

## Pokemon\_FIRE

See Slide for details

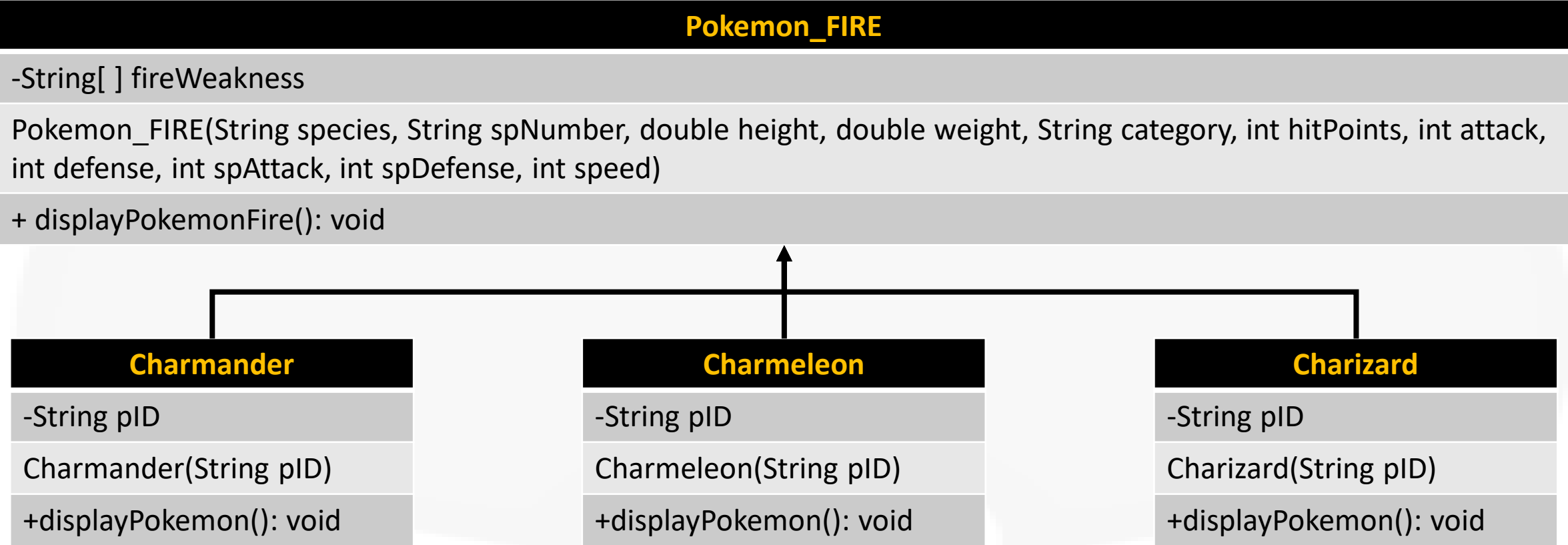
## Pokemon\_WATER

See Slide for details

## Pokemon Method Specification Chart

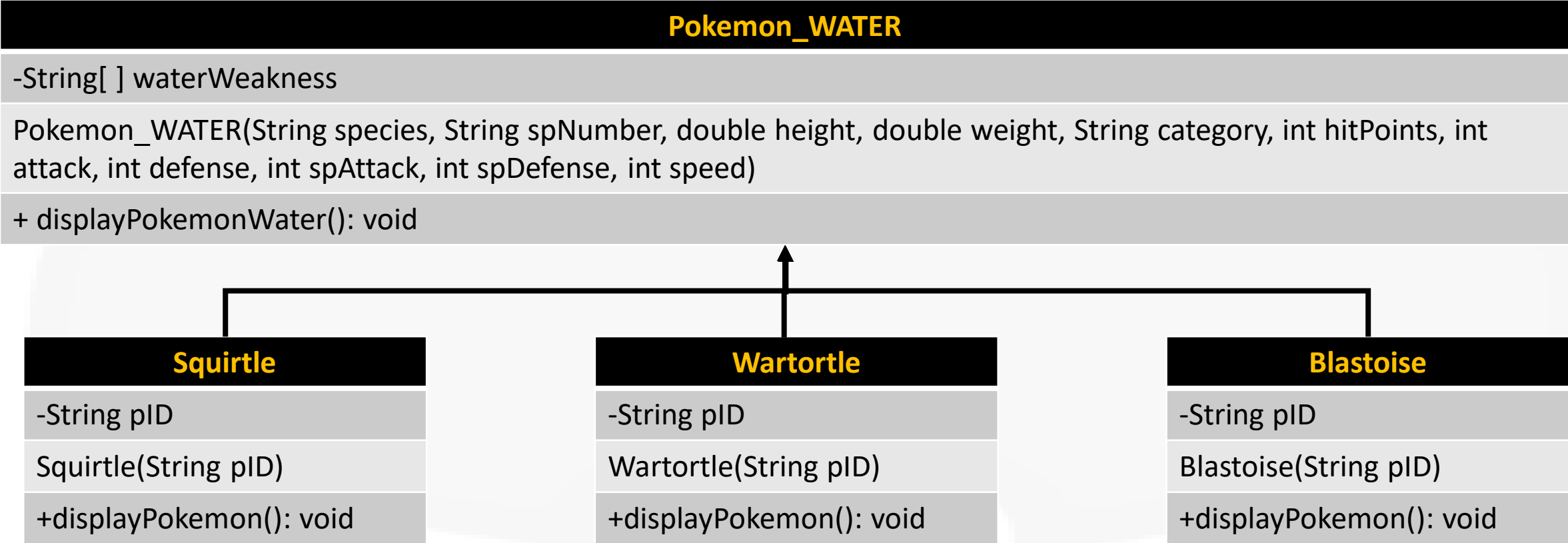
Method	Input	Processing	Output
displayPokemon	None	<u>prints to console</u> a String representation of the Pokemon object... <i>you may create this anyway you like as long as it is consistent with Expected Output slide</i>	String printed to console

# Pokemon\_FIRE Class



Pokemon_FIRE Method Specification Chart			
Method	Input	Processing	Output
displayPokemonFire	None	<u>prints to console</u> a String representation of the Pokemon_FIRE object... <i>you may create this anyway you like as long as it is consistent with Expected Output slide</i>	String printed to console

# Pokemon\_WATER Class



Pokemon_WATER Method Specification Chart			
Method	Input	Processing	Output
displayPokemonWater	None	<u>prints to console</u> a String representation of the Pokemon_WATER object... <i>you may create this anyway you like as long as it is consistent with Expected Output slide</i>	String printed to console

# Pokemon\_FIRE and Pokemon\_WATER Subclass Methods

**\*\*These Instruction apply to all subclasses of Pokemon\_WATER and Pokemon\_FIRE\*\***

Method	Input	Processing	Output
displayPokemon	None	<u>prints to console</u> a String representation of the object... <i>you may create this anyway you like as long as it is consistent with Expected Output slide</i>	String printed to console



# PokemonBuilder Class

## PokemonBuilder

+static randomFirePokemon(String p): Pokemon\_FIRE  
+static randomWaterPokemon(String p): Pokemon\_WATER  
+static buildPokemon(int water, int fire): Pokemon[ ]

## PokemonBuilder Method Specification Chart

Method	Input	Processing	Output
randomFirePokemon	<b>p</b> ID Number	Creates and returns any random Pokemon_FIRE subclass object	Pokemon_FIRE subclass object
randomWaterPokemon	<b>p</b> ID Number	Creates and returns any random Pokemon_WATER subclass object	Pokemon_WATER subclass object
buildPokemon	<b>water</b> number of Pokemon_WATER objects <b>fire</b> number of Pokemon_FIRE objects	Creates and returns the specified number of randomly generated Pokemon_WATER and Pokemon_FIRE subclass objects in an array	Pokemon array

# Expected Output

Your Pokemon may be different because they are randomly generated but the format should be EXACTLY as shown

```
Console X
<terminated> Gene (7) [Java Application] C:\Users\GeneLocklear_fea30p7\p2\pool\plugins\org.eclipse.just
```

CHARIZARD F-0

Fire Pokemon

Species: Charizard

SP Number: #0006                      Type: Fire Pokemon

Height: 5.07      Weight: 199.5

Category: Flame

Hit Points: 50    Attack: 50              Defense: 50

SP Attack: 105    SP Defense: 75

Speed: 6

**\*\*Weaknesses\*\***

Ground   Water   Rock                      \*\*\*\*\*

CHARMELEON F-1

Fire Pokemon

Species: Charmeleon

SP Number: #0005                      Type: Fire Pokemon

Height: 3.07      Weight: 41.9

Category: Flame

Hit Points: 40    Attack: 40              Defense: 40

SP Attack: 75    SP Defense: 60

Speed: 5

**\*\*Weaknesses\*\***

Ground   Water   Rock                      \*\*\*\*\*

BLASTOISE W-0

Water Pokemon

Species: Blastoise

SP Number: #0009                      Type: Water Pokemon

Height: 5.03      Weight: 188.5

Category: Shellfish

Hit Points: 50    Attack: 50              Defense: 60

SP Attack: 75    SP Defense: 105

Speed: 5

**\*\*Weaknesses\*\***

Grass    Electric                      ~~~~~

SQUIRTLE W-1

Water Pokemon

Species: Squirtle

SP Number: #0007                      Type: Water Pokemon

Height: 1.08      Weight: 19.8

Category: Tiny Turtle

Hit Points: 30    Attack: 30              Defense: 40

SP Attack: 45    SP Defense: 60

Speed: 3

**\*\*Weaknesses\*\***

Grass    Electric                      ~~~~~