

# SdPd/java Lab Exam 4

## Objective: Pay As Go, Bill Pay and Employer Pay Mobile Phones

Tribes Phones operates a variety of mobile phone contracts. Design an OO inheritance based class structure to model a collection of ordinary, EmployerPay, PayAsGo and BillPay phone plans.

1. **Download** the lab exam 4 starter **zip** file and extract the folder, **Save** on the desktop (**not** your Network account, local C drive or USB)
  - Rename the **SurnameFirstNameLabEx4** folder as per your own name  
E.g. **AgnewGerryLabEx4** folder
  - Rename the **SurnameFirstNameLabEx4Test** test/driver classes as per your own name  
E.g. **AgnewGerryLabEx4Test1, 2 and 3**
  - To be **verified** by your lab supervisor
2. Examine/verify the existing empty/partial class files provided to be coded/implemented
  - Add your **Program Id, Name** and **Description** as **comments** at the top of each class
3. **Warning:** Marks will be deducted for **poor programming practices** such as:
  - Lacking meaningful variable names, white-space, indentation, etc.
  - Ensure redundant code is deleted prior to program submission
  - Code that is not tested - ensure that all methods are called/exercised at least once
4. **Country** class (embedded as an inner class):

private Member Variables	countryId (integer)	countryName (String)
Member Methods	Default Constructor	All Parameter Constructor
	setCountry	toString
	setCountryId	getCountryId
	setCountryName	getCountryName
– setCountry ( ) changes existing Country object details		

5. **MobilePhone** super class with inner **Country** class instance:

private Member Variables	mobileNumber (int) mobileProvider (String) country (Country)	mobileName (String) mobile4G (boolean)
Member Methods	Default Constructor	All Parameter Constructor
		Mobile Phone Param Constructor
	setMobilePhone	toString
	setMobileNumber	getMobileNumber
	setMobileName	getMobileName
	setMobileProvider	getMobileProvider
	setMobile4G	getMobile4G
	setCountry	getCountry
– setMobilePhone ( ) only changes existing Mobile Phone object details (excluding Country details)		

6. Sub class **EmployerPay** inherits or is derived from the Super class **MobilePhone**:

private Member Variables	employerId (int)	
Member Methods	Default Constructor	All Parameter Constructor
		toString
	setEmployerId	getEmployerId

7. Sub class **PayAsGo** inherits or is derived from the Super class **MobilePhone**:

private Member Variables	creditBalance (double)	
Member Methods	Default Constructor	All Parameter Constructor
		toString
	setCreditBalance	getCreditBalance
	setCreditBalance (int)	
– Overloaded setCreditBalance (int) increases the credit balance by the integer amount provided e.g. €15		

8. Sub class **BillPay** inherits or is derived from the Super class **MobilePhone**:

private Member Variables	textsLeft (int)	DEFAULT_MINUTES (double) = 100.00 minutesLeft (double)
Member Methods	Default Constructor	All Parameter Constructor
	setBillPay	toString
	setTextsLeft	getTextsLeft
	setMinutesLeft	getMinutesLeft
– setBillPay ( ) only changes existing Bill Pay object details		
– Default minutesLeft is 100 if not provided and should be defined as a class constant		

9. **SurnameFirstNameLabEx4Test1 driver class (without an object array):**

- Code a test/driver class that creates 2 simple object instances of each of the above classes (without object arrays) using the sample data provided (3 Mobile Phone instances)
- Which calls both default and parameter descriptors and the associated setMobilePhone/ setCountry/setEmployerId/setCreditBalance or setBillPay methods as appropriate to update default/blank objects as indicated
- Then output the associated toString ( ) method to verify the object contents
- Match the attached page 4 **Screenshot 1** output

10. **SurnameFirstNameLabEx4Test2 driver class (with an object array):**

- Declare an object array of mixed ordinary, EmployerPay, PayAsGo and BillPay mobile phone object instances using the sample data already provided
- Interrogate each object and output the class name before each line output
- Then output the object array contents using the toString ( ) method on the same line within a **for loop**
- Match the attached page 4 **Screenshot 2** output

11. **SurnameFirstNameLabEx4Test3 driver class (with an object array and menu):**

- Declare an object array of mixed ordinary, EmployerPay, PayAsGo and BillPay mobile phone object instances using the sample data already provided

- Display the Tribes Phones Menu (code provided) – see page 4 **Screenshot 3**
  - Then call selected methods as required from the while loop/switch statement provided
12. **List All Mobile Phones** (menu option 1/see page 4 **Screenshot 4**)
    - List details for all Mobile Phone objects prefixed by the class name (same as Test 2)
  13. **List Employer Pay Phones** (menu option 2/see page 5 **Screenshot 5**)
    - List details for all Employer Pay objects prefixed by the class name
  14. **List Pay As Go Phones** (menu option 3/see page 5 **Screenshot 6**)
    - List details for all Pay As Go objects prefixed by the class name
  15. **List Bill Pay Phones** (menu option 4/see page 5 **Screenshot 7**)
    - List details for all Bill Pay objects prefixed by the class name
  16. **List Only Mobile Phones** (menu option 5/see page 5 **Screenshot 8**)
    - List details for Mobile Phone objects only prefixed by the class name
    - i.e. qualifying ordinary Mobile Phones but **not** Employer Pay, Pay As Go or Bill Pay objects
  17. **Query Employer Pay Phones** (menu option 6/see page 5 **Screenshot 9**)
    - Prompt/input a mobile phone Employer Id
    - Query/list all Employer Pay objects for the specified employer Id prefixed by the class name
    - Otherwise, display an appropriate warning message if no qualifying objects discovered
  18. **Increase Mobile Provider Texts** (menu option 7/see page 5 **Screenshot 10**)
    - Prompt/input a mobile phone Provider name
    - Then using existing methods and without coding any new methods
    - Increase all Bill Pay object Texts Left by 75% (\* 1.75) for the provider specified
    - Showing both the before and after (toString) object contents (i.e. before/after Texts)
    - Otherwise, display an appropriate warning message if no qualifying objects discovered
  19. **Rename Mobile Phone Country** (menu option 8/see page 6 **Screenshot 11**)
    - Prompt/input a mobile phone number
    - Search for that mobile number using a while loop and standard search functionality
    - Prompt/input and update a new Country Id and Name using an existing method
    - Showing both the before and after (toString) object contents
    - Otherwise, display a Mobile Phone Number not found – try again error message
  20. **Increase Pay As Go Credit** (menu option 9/see page 6 **Screenshot 12**)
    - Prompt/input a mobile phone number
    - Search for that mobile number using a while loop and standard search functionality
    - Prompt/Enter (int + double) and update either:
      - a new double Credit value (eg. 0 33.9) or alternatively an integer Credit increase (eg. 50 0.0)
    - Showing both the before and after (toString) object contents
    - Otherwise, display a Mobile Phone Number not found – try again error message
    - Otherwise, display a Mobile Phone is not Pay As Go – try again error message
  21. **The End:** when finished Save and Exit TextPad
    - Zip (R/click: Send Compressed) your **SurnameFirstNameLabEx4** folder
    - Upload your **SurnameFirstNameLabEx4** zip file to the Moodle link provided
    - To be **verified** by your supervisor **before** you **submit** the zip file
    - Save a backup copy of the **SurnameFirstNameLabEx4** folder to your network account

### Test Mobile Phones 1 Screenshot 1

Ref	Number	Name	Provider	4G	Country	Id/Name	
c1:					0	noCountry	
c1:					353	Ireland	
c2:					44	Britain	
m1:	0	noName	noProv	false	0	noCountry	
m1:	1111111	Red fone	Vodafone	true	353	Ireland	
m2:	2222222	Green fone	Orange	false	44	Britain	
m3:	3333333	Blue fone	02	false	0	noCountry	
m3:	3333333	Blue fone	02	false	234	Spain	
e1:	0	noName	noProv	false	0	noCountry	Emp: 0
e1:	4444444	Grey fone	Talk Talk	false	353	Ireland	Emp: 1234
e2:	5555555	Brown fone	02	false	1	USA	Emp: 3456
g1:	0	noName	noProv	false	0	noCountry	Cred: 0.0
g1:	6666666	Grey fone	Vodafone	true	353	Ireland	Cred: 99.99
g2:	7777777	White fone	02	true	44	Britain	Cred: 88.88
b1:	0	noName	noProv	false	0	noCountry	Txt: 0 Min: 100.0
b1:	8888888	Navy fone	02	false	1	USA	Txt: 50 Min: 55.55
b2:	9999999	Black fone	Metear	true	353	Ireland	Txt: 300 Min: 300.0

### Test Mobile Phones 2 Screenshot 2

Class Name	Number	Phone Name	Provider	4G	Country	Name	
MobilePhone	1111111	Red fone	Vodafone	true	353	Ireland	
MobilePhone	2222222	Green fone	Orange	false	44	Britain	
MobilePhone	3333333	Blue fone	02	false	234	Spain	
EmployerPay	4444444	Grey fone	TalkTalk	false	353	Ireland	Em: 1234
EmployerPay	5555555	Brown fone	02	false	1	USA	Em: 3456
PayAsGo	6666666	Grey fone	Vodafone	true	353	Ireland	Cr: 99.99
PayAsGo	7777777	White fone	02	true	44	Britain	Cr: 88.88
BillPay	8888888	Navy fone	02	false	1	USA	Tx: 50 Mi: 55.55
BillPay	9999999	Black fone	Metear	true	353	Ireland	Tx: 300 Mi: 300.0

### Mobile Phones Menu Screenshot 3

Tribes Mobile Phone Menu Options							
1:	List All Mobile Phones	2:	List Employer Pay Phones				
3:	List Pay As Go Phones	4:	List Bill Pay Phones				
5:	List Only Mobile Phones	6:	Query Employer Pay Phones				
7:	Inc Mobile Provider Texts	8:	Rename Mobile Phone Country				
9:	Increase Pay As Go Credit	0:	Quit				
Enter option:							

### Menu Option 1: List All Mobile Phones Screenshot 4

Enter option: 1							
Class Name	Number	Phone Name	Provider	4G	Country	Name	
MobilePhone	1111111	Red fone	Vodafone	true	353	Ireland	
MobilePhone	2222222	Green fone	Orange	false	44	Britain	
MobilePhone	3333333	Blue fone	02	false	234	Spain	
EmployerPay	4444444	Grey fone	TalkTalk	false	353	Ireland	Em: 1234
EmployerPay	5555555	Brown fone	02	false	1	USA	Em: 3456
PayAsGo	6666666	Grey fone	Vodafone	true	353	Ireland	Cr: 99.99
PayAsGo	7777777	White fone	02	true	44	Britain	Cr: 88.88
BillPay	8888888	Navy fone	02	false	1	USA	Tx: 50 Mi: 55.55
BillPay	9999999	Black fone	Metear	true	353	Ireland	Tx: 300 Mi: 300.0

### Menu Option 2: List Employer Pay Phones Screenshot 5

Enter option: 2

Class Name	Number	Phone Name	Provider	4G	Country Name	
EmployerPay	4444444	Grey fone	TalkTalk	false	353 Ireland	Em: 1234
EmployerPay	5555555	Brown fone	O2	false	1 USA	Em: 3456

### Menu Option 3: List Pay As Go Phones Screenshot 6

Enter option: 3

Class Name	Number	Phone Name	Provider	4G	Country Name	
PayAsGo	6666666	Grey fone	Vodafone	true	353 Ireland	Cr: 99.99
PayAsGo	7777777	White fone	O2	true	44 Britain	Cr: 88.88

### Menu Option 4: List Bill Pay Phones Screenshot 7

Enter option: 4

Class Name	Number	Phone Name	Provider	4G	Country Name	
BillPay	8888888	Navy fone	O2	false	1 USA	Tx: 50 Mi: 55.55
BillPay	9999999	Black fone	Metear	true	353 Ireland	Tx: 300 Mi: 300.0

### Menu Option 5: List Only Mobile Phones Screenshot 8

Enter option: 5

Class Name	Number	Phone Name	Provider	4G	Country Name	
MobilePhone	1111111	Red fone	Vodafone	true	353 Ireland	
MobilePhone	2222222	Green fone	Orange	false	44 Britain	
MobilePhone	3333333	Blue fone	O2	false	234 Spain	

### Menu Option 6: Employer Pay Phones by Id Screenshot 9

Enter option: 6

Enter Employer Id: 1111

No qualifying Mobile Phones selected - try again

Enter option: 6

Enter Employer Id: 1234

Class Name	Number	Phone Name	Provider	4G	Country Name	
EmployerPay	4444444	Grey fone	TalkTalk	false	353 Ireland	Em: 1234

### Menu Option 7: Increase Mobile Provider Texts Screenshot 10

Enter option: 7

Enter Provider Name: Orange

No qualifying Mobile Phones selected - try again

Enter option: 7

Enter Provider Name: O2

Class Name	Number	Phone Name	Provider	4G	Country Name	
BillPay	8888888	Navy fone	O2	false	1 USA	Tx: 50 Mi: 55.55
BillPay	8888888	Navy fone	O2	false	1 USA	Tx: 87 Mi: 55.55

## Menu Option 8: Rename Mobile Country Screenshot 11

Enter option: 8

Enter Mobile Number: 12345

Mobile Number not found - try again

Enter option: 8

Enter Mobile Number: 3333333

Class Name	Number	Phone Name	Provider	4G	Country Name
MobilePhone	3333333	Blue fone	02	false	234 Spain

Enter new Country Id & Name (int & String): 777 NewSpain

MobilePhone	3333333	Blue fone	02	false	777 NewSpain
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## Menu Option 9: Increase Pay As Go Credit Screenshot 12

Enter option: 9

Enter Mobile Number: 1234

Mobile Number not found - try again

Enter option: 9

Enter Mobile Number: 1111111

Mobile Phone not a Pay as Go phone - try again

Enter option: 9

Enter Mobile Number: 6666666

Class Name	Number	Phone Name	Provider	4G	Country Name
PayAsGo	6666666	Grey fone	Vodafone	true	353 Ireland

Enter new Credit or Credit increase (double & int): 12.34 0

PayAsGo	6666666	Grey fone	Vodafone	true	353 Ireland	Cr: 12.34
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Enter option: 9

Enter Mobile Number: 7777777

Class Name	Number	Phone Name	Provider	4G	Country Name
PayAsGo	7777777	White fone	02	true	44 Britain

Enter new Credit or Credit increase (double & int): 0.0 11

PayAsGo	7777777	White fone	02	true	44 Britain	Cr: 99.88
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