**Assignment 1: Employee Management System**

**Problem Statement**

You are tasked with creating an **Employee Management System** using inheritance and abstract classes. The system should:

1. Store a list of employees in an array.
2. Differentiate between **FullTimeEmployee** and **PartTimeEmployee** using inheritance.
3. Calculate the monthly salary based on the type of employee.

Implement the following:

* An **abstract class** Employee with:
  + name (String), employeeId (int), and baseSalary (double) fields.
  + An abstract method double calculateSalary() to calculate the monthly salary.
  + A concrete method String getDetails() to display employee details.
* A **FullTimeEmployee** class that:
  + Inherits from Employee.
  + Includes an additional double bonus field.
  + Overrides calculateSalary() to return baseSalary + bonus.
* A **PartTimeEmployee** class that:
  + Inherits from Employee.
  + Includes an additional int hoursWorked and double hourlyRate fields.
  + Overrides calculateSalary() to return hoursWorked \* hourlyRate.
* A Main class to:
  + Create an array of Employee objects.
  + Populate the array with a mix of full-time and part-time employees.
  + Display the details and salary of each employee.

**Input**

* Full-time employee details: name, employeeId, baseSalary, and bonus.
* Part-time employee details: name, employeeId, hoursWorked, and hourlyRate.

**Sample Input**

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John, 101, 5000.0, 1000.0 (FullTime)

Jane, 102, 20, 50.0 (PartTime)

Mike, 103, 3000.0, 500.0 (FullTime)

**Sample Output**

Name: John, ID: 101, Type: FullTime, Salary: 6000.0

Name: Jane, ID: 102, Type: PartTime, Salary: 1000.0

Name: Mike, ID: 103, Type: FullTime, Salary: 3500.0

**Assignment 2: Shape Area Calculator**

**Problem Statement**

You are tasked with designing a **Shape Area Calculator** using inheritance and abstract classes. The program should:

1. Store shapes in an array.
2. Differentiate between **Rectangle** and **Circle** using inheritance.
3. Calculate the area of each shape based on its type.

Implement the following:

* An **abstract class** Shape with:
  + A String shapeName field.
  + An abstract method double calculateArea() to calculate the area.
  + A concrete method String getDetails() to display shape details.
* A **Rectangle** class that:
  + Inherits from Shape.
  + Includes double length and double width fields.
  + Overrides calculateArea() to return length \* width.
* A **Circle** class that:
  + Inherits from Shape.
  + Includes double radius field.
  + Overrides calculateArea() to return Math.PI \* radius \* radius.
* A Main class to:
  + Create an array of Shape objects.
  + Populate the array with a mix of rectangles and circles.
  + Display the details and area of each shape.

**Input**

* Rectangle details: length, width.
* Circle details: radius.

**Sample Input**

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Rectangle, 10.0, 5.0

Circle, 7.0

Rectangle, 8.0, 4.0

Circle, 3.0

**Sample Output**

Shape: Rectangle, Area: 50.0

Shape: Circle, Area: 153.94

Shape: Rectangle, Area: 32.0

Shape: Circle, Area: 28.27

**Key Features for Both Assignments**

1. Use an **abstract class** to define common behavior for subclasses.
2. Use **inheritance** to extend functionality for specific types.
3. Store objects in an **array** and process them using loops.
4. Focus on **method overriding** to provide custom implementations.