

Q3. (This exercise is based on a question in a previous Test paper by Dr. W.K. Chan / CS2312 [2013-2014 Sem A])

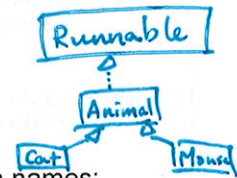
Given the class Animal, the interface Runnable, and the main() method as follows. Follow the requirements below to make the program successfully executed. The expected output of the program is Tom Catches Jerry.

<pre>public class Animal {     private String name;     public Animal(String n) {name=n;}     public String getName() {return name;} }  interface Runnable {     public int getRunSpeed();     public String getMyName(); }</pre>	<pre>public class Main {     public static void main(String[] args)     {         Cat Tom = new Cat("Tom");         Mouse Jerry = new Mouse("Jerry");         Tom.chase(Jerry);     } }</pre>
---	---

Output:  
Tom Catches Jerry

Your tasks:

1. Create two new subclasses Cat and Mouse of Animal.
2. Change Animal to an abstract class
3. Revise the Animal class to implement the interface Runnable
4. Implement the method getMyName() in Cat and Mouse to return their own names;
5. Implement the method getRunSpeed() in Cat to return a speed of 5.  
Implement the method getRunSpeed() in Mouse to return a speed of 2.
6. Implement the method chase(Runnable target) in Cat to print corresponding message based on the following conditions:



If the run speed of the cat (e.g. Tom) is faster than the run speed of the target (e.g. Jerry), then print the message "[Cat] Catches [Target]", otherwise print "[Cat] Cannot Catch [Target]". [Cat] and [Target] should be replaced by their own names (e.g. the message is "Tom Catches Jerry").

The classes in the final program:

<pre>public <u>abstract</u> class Animal <u>implements Runnable</u> {     private String name;     public Animal(String n) {name=n;}     public String getName() {return name;} }  interface Runnable {     public int getRunSpeed();     public String getMyName(); }</pre>	<pre>public class Main {     public static void main(String[] args)     {         Cat Tom = new Cat("Tom");         Mouse Jerry = new Mouse("Jerry");         Tom.chase(Jerry);     } }</pre>
<pre>public class Cat <u>extends Animal</u> {     public Cat (String n) {super (n);}     public String getMyName() {return getName;}     public int getRunSpeed() {return 5;}     public void chase (Runnable t)     {         if (.....)             System.out.println (...);         else ...     } }</pre>	<pre>public class Mouse -----     -&gt; similar     -&gt; similar     -&gt; similar</pre>

Output:  
Tom Catches Jerry