

Q2. (This exercise is based on a question in a previous Test paper by Dr. W.K. Chan / CS2312 [2013-2014 Sem A])

The program below models Footballs and Pianos as playables which are played by persons.

<pre>public class Football {     public void play()     {         System.out.println("Play football");     } }</pre>	<pre>public class Piano {     public void play()     {         System.out.println("Play piano");     } }</pre>
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<pre>public class Person {     public Football getFootball(String toyName)     {         if (toyName.equals("Football"))             return new Football();         else             return null;     }     public Piano getPiano(String toyName)     {         if (toyName.equals("Piano"))             return new Piano();         else             return null;     } }</pre>	<pre>public class Main {     public static void main(String[] args)     {         Person person = new Person();         String[] playables = { "Football",                                "Piano",                                "Piano",                                "Football"};          for (int i=0;i&lt;playables.length;i++)         {             if (playables[i].equals("Football"))                 person.getFootball(playables[i]).play();             else if (playables[i].equals("Piano"))                 person.getPiano(playables[i]).play();         }     } }</pre>
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**Output:**  
 Play football  
 Play piano  
 Play piano  
 Play football



step 3.

step 4. implements Playable

Playable getPlay

```
interface Playable
{
    void play();
}
```

for (String s: playables) person.getPlay(s).play();

```
public static void main(String[] args)
{
    Person person = new Person();
    String[] playables = { "Football",
                           "Piano",
                           "Piano",
                           "Football"};

    for (int i=0;i<playables.length;i++)
        person.getPlay(playables[i]).play();
}
```

**Output (no change):**  
 Play football  
 Play piano  
 Play piano  
 Play football

step 4

Your task:

1. Replace the code in the main() method as →
2. Rewrite the for-loop in main() using for-each loop.
3. Merge the two methods getPiano(String toyName) and getFootball(String toyName) into only one method getPlay(String toyName) in the Person class, which returns an object of type Playable.
4. Create the Playable interface (and adjust the declarations of some other classes correspondingly) to make the new main() method successfully executed.
5. Extend the program with Chess as an added playable. The list of playables in main() should be revised as:

<pre>String[] playables = { "Football",                        "Piano",                        "Piano",                        "Football",                        "Chess"};</pre>	<p><b>Output:</b>              Play football              Play piano              Play piano              Play football              Play chess</p>
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Do not need to change Playable, Football, Piano.