

Ahsanullah University of Science and Technology	
Course Title: Object-Oriented Programming Lab	Course No: CSE1206
Spring 2020	Total Marks: 20

Submission Deadline: 21st March 11:59 PM

- All variables must be declared private.
- You can give any meaningful name to your Project.
- You should handle any exceptions in the main method only.
- Take user input in the main method.

<p>Researchers in NASA receive signals from the Mars Rover with different information and messages. The information is embedded only in positive numbers whose only prime factors are 2, 3, or 5. Any number that has prime factors other than 2,3 or 5 is discarded.</p> <p><i>For example, 10 is a positive number embedded with meaningful information because its prime factors are 2 and 5. But prime for 14 is 2 and 7. So, it is discarded.</i></p> <p>Now you are asked to develop a program that will be used to help the scientists to receive and decode the signal waves.</p>	
<p>Inside the project create a package named: exceptions. Inside this package create a user-defined <u>checked/compile-time</u> exception named NoInformationFoundException and override both the empty constructor and also the constructor which takes a String as a parameter.</p>	2
<p>Now you have to develop a checkSignal() method which will check if the received signal number follows the condition stated in the scenario or not. If not then it will give NoInformationFoundException with the message "Invalid Signal Received! Please Discard it." Otherwise, it will print "Signal Received with Information!"</p> <p>All classes and interfaces below should be created in the project-generated package.</p>	
Create an interface called Signal which has the void method checkSignal()	1
Create an abstract class called Receiver which implements Signal . This Receiver class has a private integer variable named code . Write the getter setter methods for this variable. No need to write the constructor. No need to override or implement the method from Signal here.	2
Create a class named Transceiver which inherits Receiver. Here you will have to override the checkSignal() method and do the checking for the number. Use the getcode() method from Receiver class as the value for the checking. <u>Do not handle the exception in this method.</u>	5

<p>Create a class named Decoder. This class contains a method decodeSignal(). This method decodes the received signal and prints the following statements under the given conditions.</p> <ul style="list-style-type: none"> • When the prime factor of the signal number is 2 it prints: "Water Found!" • When the prime factor of the signal number is 3 it prints: "Microorganism Found!" • When the prime factor of the signal number is 5 it prints: "Minerals Found!" 	5
<p>Take user input.</p> <p>Now in the main class inside the main method create an object of Transceiver, assign a number to the "code" variable using the setter method, and then call the checkSignal() method.</p> <p>If the signal fulfills the condition of being a meaningful signal and has embedded information then only you should call the decodeSignal() from the Decoder class to find out what information the signal prints.</p>	5