Practice Problem 11: Pick A Series

Problem statement: The GUI for an app to find out the n^{th} number in a series is provided to you (Fig.1). This app currently supports three series: Prime numbers, Fibonaccis, and Factorials. User enters the number n, clicks on one of the three choices on the buttons, and the app displays the nth number in that series (Fig.2, 3, 4). You need to **create the Series classes and the event-handlers** to complete the app.

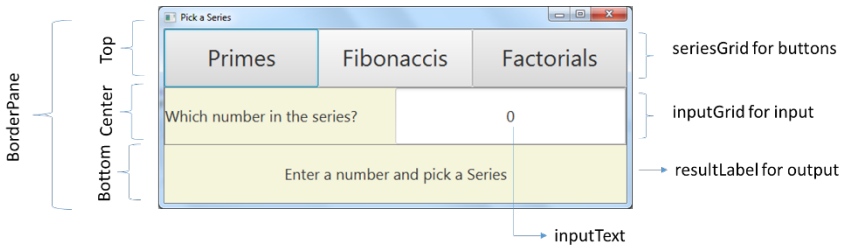


Figure 1: GUI components in opening screen

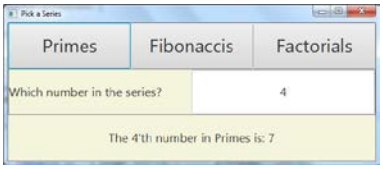


Figure 2: (2, 3, 5, 7, ...)
User entered 4 and pressed Primes button

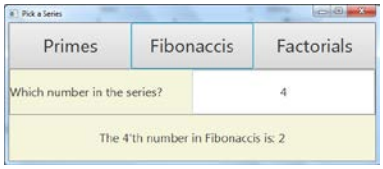


Figure 3: (0, 1, 1, 2, 3, ...)
User entered 4 and pressed Fibonaccis

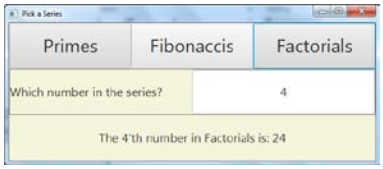
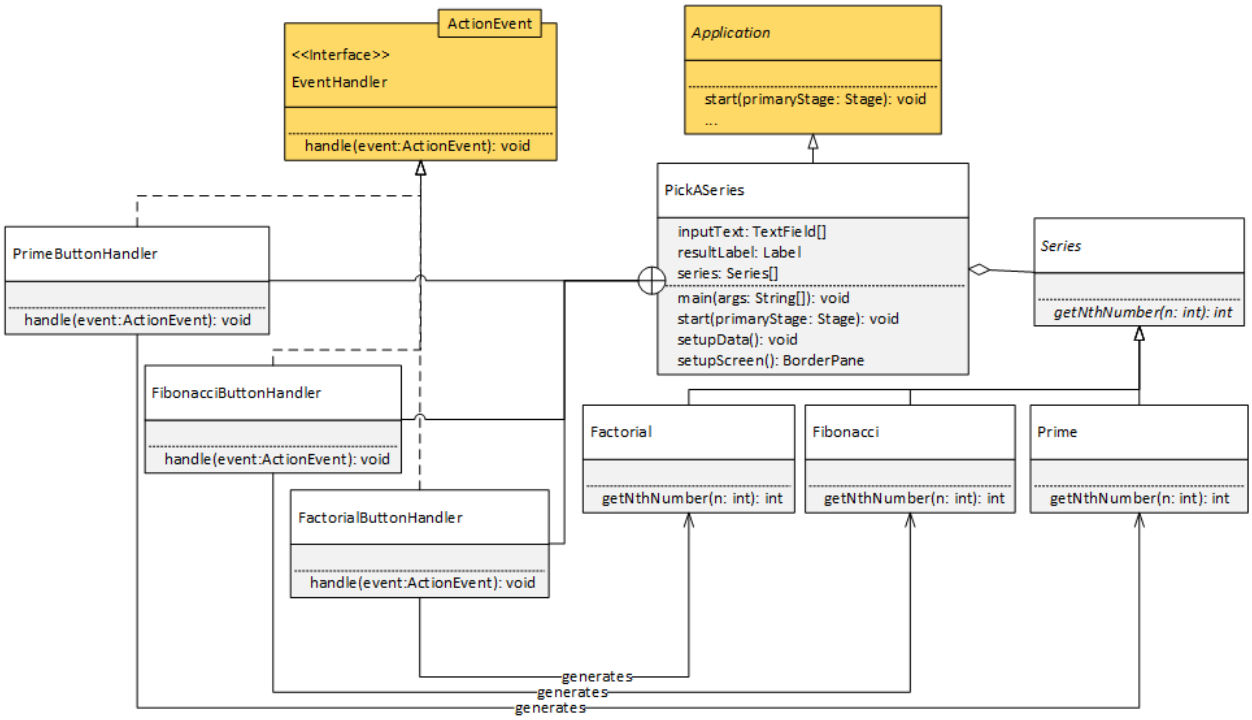


Figure 4: (1, 1, 2, 6, 24, 120, ...)
User entered 4 and pressed Factorials

Solution Design: The UML shows the classes and their methods and variables. You can add or change methods or variables, if needed. The program is launched from PickASeries.java. Its GUI has three buttons as shown in Fig.1. These buttons are tied to SeriesHandler. You need to do the following



1. Create an abstract **Series** class with abstract getNthNumber() method.
2. Create **Prime**, **Fibonacci**, and **Factorial** classes that extend Series and implement getNthNumber() that returns the n^{th} number in that series.
    - Primes: The count n starts from 1. The 1^{st} Prime is 2.
    - Fibonaccis: The count n starts from 0. The 0^{th} Fibonacci is 0.
    - Factorial: The count n starts from 0. The 0^{th} Factorial is 1.
3. Fill in **SeriesHandler** in PickASeries.java that updates the resultLabel as shown in Figure 2, Figure 3, Figure 4. Note that each series should be instantiated only once in your program.