Installation Guide to Twin Primes (1.0.0)

Developer: Esha Adhawade

Project: Twin Primes: Hexagon Crosses

Project Description:

- The goal of this project is to create an application for math professors to get a list of twin primes and hexagon crosses when they input a number of N's.

Required Software:

- For this project, the user must download the latest version of Eclipse, along with JavaFX and SceneBuilder. This is the foundation to run the GUI and the program.

Tutorials to Setup Required Software:

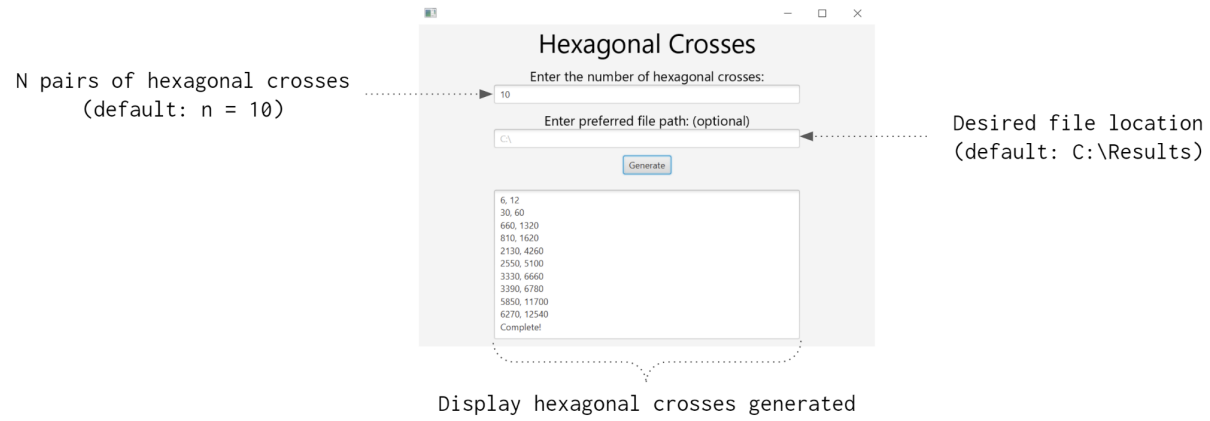
- Download Eclipse from (may differ based on your OS): https://www.eclipse.org/downloads/
- Download JavaFX from: https://gluonhq.com/products/javafx/
- Setting up JavaFX: https://www.youtube.com/watch?v=bk28ytggz7E&feature=youtu.be
- Download SceneBuilder from: https://gluonhq.com/products/scene-builder/#download
- Setting up SceneBuilder: https://youtu.be/yngO5WwfZCY?t=84

Required Files: Driver.java, Prime.java, TwinPrimes.java, FileIO.java, Main.java

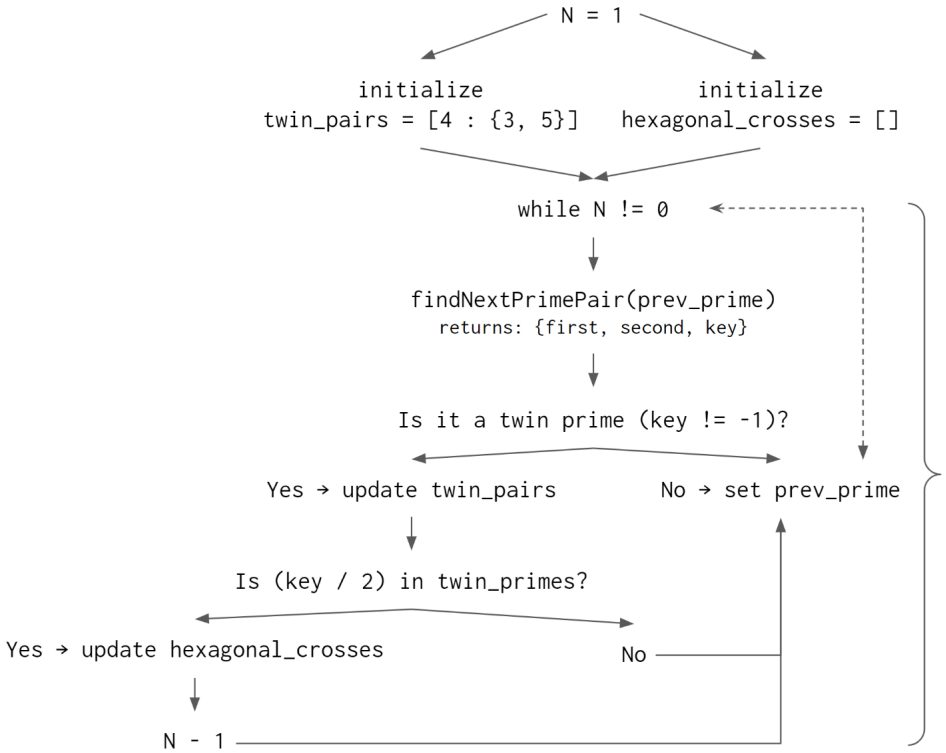
How to Run:

- TwinPrime > src > application > Main.java > Main
- Right click on main(String[]): void > Run As > Java Application
- Keyboard shortcut: (Alt + Shift + X, J)

GUI Sample:



Example Test Cases:



Sample: N = 1

<1> findNextPrimPair(5) → {5, 7, 6}
    <1.1> It is a prime pair → [4: {3,5}, 6: {5,7}]
    <1.2> 6/2 (3) is not in twin_primes
    <1.3> prev_prime = 7

<2> findNextPrimPair(7) → {7, 11, -1}
    <2.1> It is NOT a prime pair
    <2.2> prev_prime = 11

<3> findNextPrimPair(11) → {11, 13, 12}
    <3.1> It is a prime pair → [4: {3,5}, 6: {5,7}, 12: {11, 13}]
    <3.2> 12/2 (6) is in twin_primes
    <3.3> hexagonal_crosses = [6, 12]
    <3.4> N - 1
    <3.5> prev_prime = 13

<4> N == 0 → break loop
<5> return hexagonal_crosses = [6, 12]

Format of Results:

- The hexagonal crosses will appear on the GUI as shown in the image of the GUI above. However, there will also be a file that is created and saved in your computer called “results.txt” that will contain the hexagonal crosses. You can specify a file location to save this file to. If you don’t, the program will automatically create a new folder called “Results” in your local drive (C:\Results\) if it doesn’t already exist. Then it will create and save “results.txt” in that folder.

Sample Requests and Expected Results:

1. N = 2
   - [{6, 12}, {30, 60}]

2. N = 5
   - [{6, 12}, {30, 60}, {660, 1320}, {810, 1620}, {2130, 4260}]

3. N = 10
   - [{6, 12}, {30, 60}, {660, 1320}, {810, 1620}, {2130, 4260}, {2550, 5100}, {3330, 6660}, {3390, 6780}, {5850, 11700}, {6270, 12540}]

4. N = 50
   - [{6, 12}, {30, 60}, {660, 1320}, {810, 1620}, {2130, 4260}, {2550, 5100}, {3330, 6660}, {3390, 6780}, {5850, 11700}, {6270, 12540}, {10530, 21060}, {33180, 66360}, {41610, 83220}, {44130, 88260}, {53550, 107100},

```
{55440, 110880}, {57330, 114660}, {63840, 127680}, {65100, 130200},
{70380, 140760}, {70980, 141960}, {72270, 144540}, {74100, 148200},
{74760, 149520}, {78780, 157560}, {80670, 161340}, {81930, 163860},
{87540, 175080}, {93240, 186480}, {102300, 204600}, {115470, 230940},
{124770, 249540}, {133980, 267960}, {136950, 273900}, {156420, 312840},
{161460, 322920}, {168450, 336900}, {183510, 367020}, {184830, 369660},
{196770, 393540}, {211050, 422100}, {211890, 423780}, {220470, 440940},
{224070, 448140}, {233940, 467880}, {237690, 475380}, {241050, 482100},
{245520, 491040}, {248640, 497280}, {253680, 507360}]
```