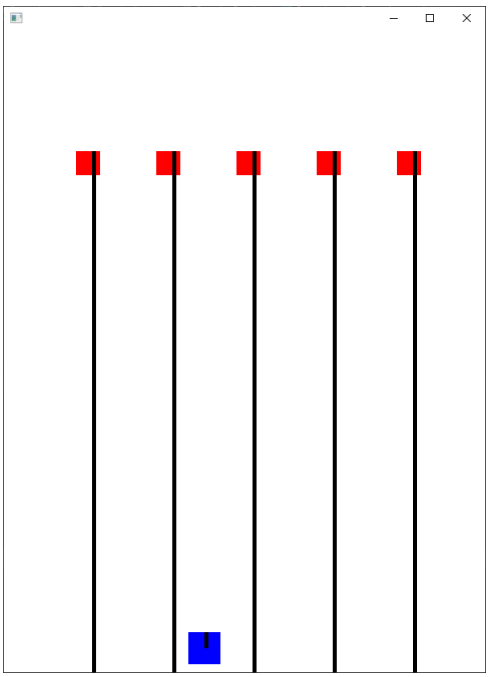
Practice 9

In this practice, we'll get familiar with JavaFX by executing and fixing a SpaceInvader game written in JavaFX.

First, you need to configure JavaFX in IntelliJ as we explained in the tutorial. If everything goes well, you should be able to execute `SpaceInvaderGame.java` that is available on Sakai.

In this game, the player is the blue rectangle, which could move to four direction by typing the corresponding arrow keys on your keyboard. In addition, by pressing `space`, the player could shoot bullets to the red enemies. Yet, the red enemies could also shoot bullets to the player. Whoever gets shot will disappear (the bullet also disappears).

Unfortunately, `SpaceInvaderGame.java` has some obvious flaws: enemies bullets keep coming while the player cannot shoot any bullet.



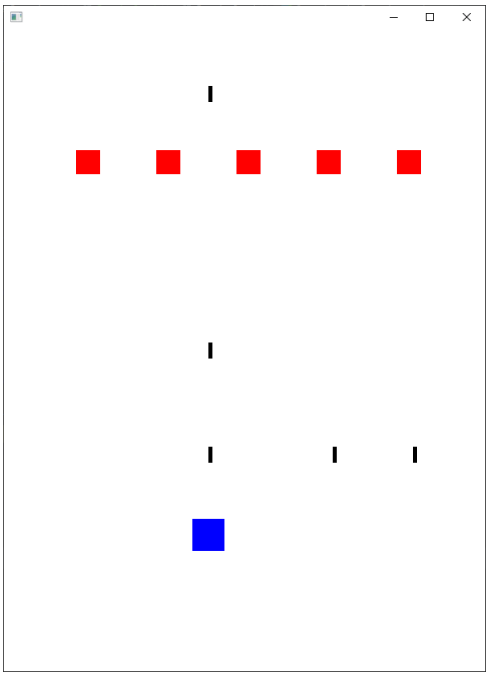
Your task is to fix `SpaceInvaderGame.java` so that:

- The player can shoot bullet to enemies, which will disappear when got shot.
- The enemies should shoot bullets with certain random intervals.

Note that JavaFX's `AnimationTimer` allows us to create a timer that is called in each `frame` while it is active. Since `AnimationTimer` is an abstract class; we need to create a custom class which extends it and override its `handle` method, **which is called in every frame**. `AnimationTimer`'s `start()` method starts the timer and the `stop()` method stops it.

Typically, the Animation Timer's speed is ~60 fps (frames per second), meaning that in every second, frames will be rendered ~60 times, therefore `handle` method will be invoked ~60 times. That's why we observe the animation, which is in fact different frames being rendered fast.

The expected result:



Evaluation

The practice will be checked before Nov.23 by teachers or SAs. What will be tested:

1. That you understand every line of your own code, not just copy from somewhere
2. That your program compiles correctly (javac)
3. Correctness of the program logic
4. That the result is obtained in a reasonable time

Late submissions after Nov.23 will incur a 20% penalty, meaning that you can only get 80% of this practice's score.