Name:_____ Date: ___/___/___ Period: ____

Objective: The student will be able to write a simple program to perform basic arithmetic operations.

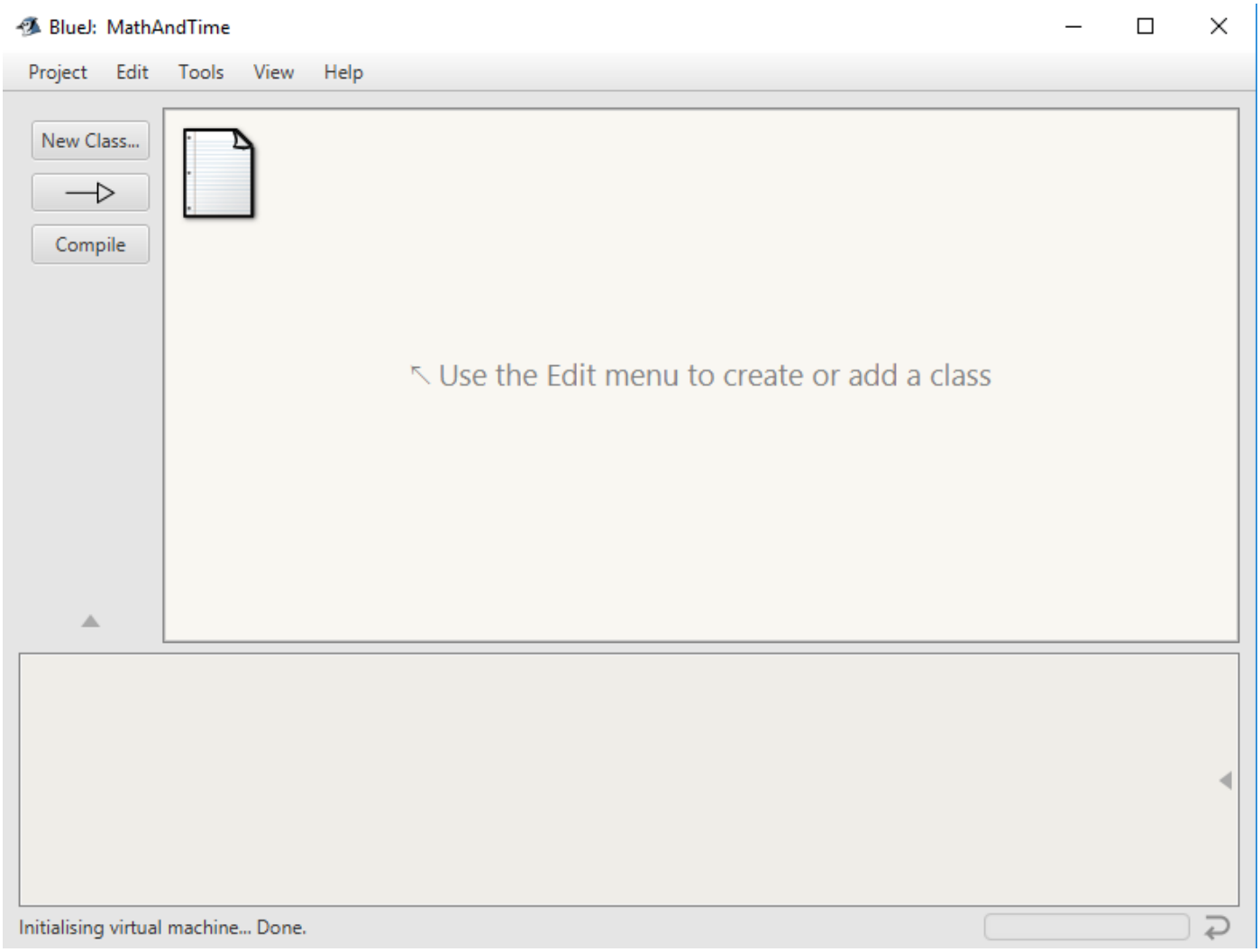
Directions: Perform the following steps.

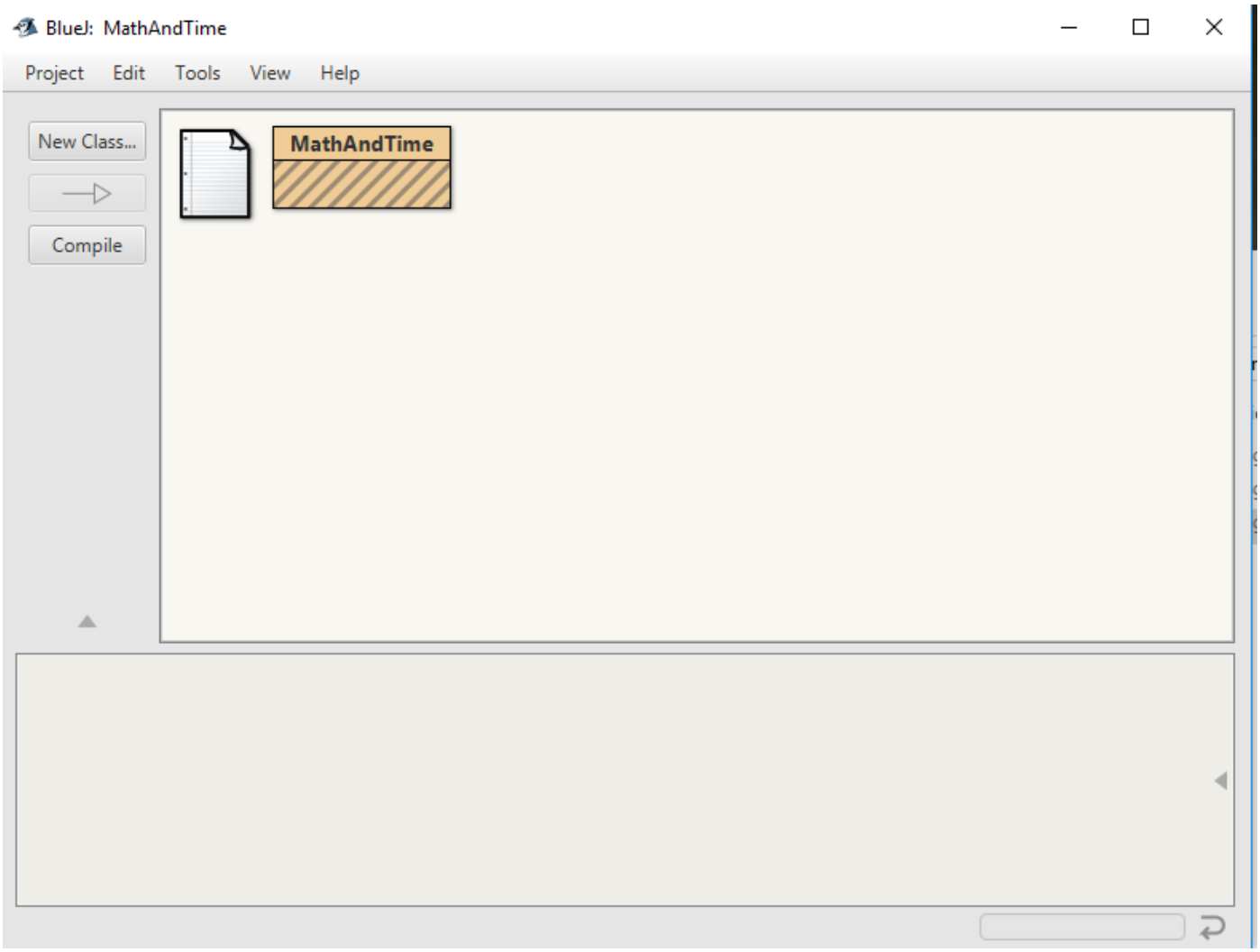
Step 1: Start BlueJ.

Step 2: Click on New Project.

Step 3: Enter a Project Name. In this case MathAndTime. The project name and the class name will be the same so the first letter should be a capital letter.

Step 4: Click on New Class and enter MathAndTime.





Step 5: Double click on the MathAndTime box to start the editor.

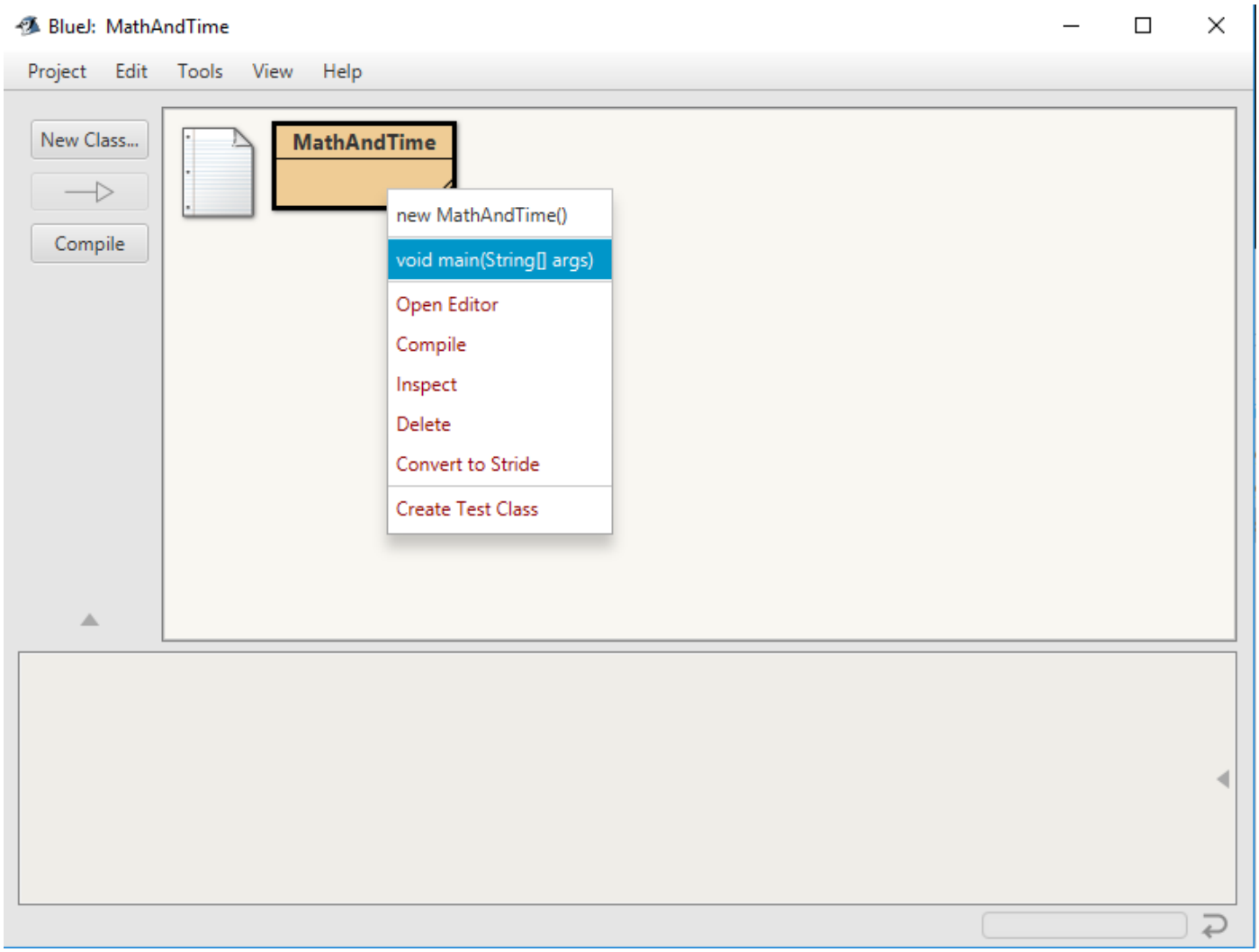
Step 6: Press Control-A to select all text in the editor screen. Press the Backspace key to remove this text.

Step7: Enter the program code shown. When declaring public class MathAndTime do not press the backspace key after entering the closing brace "}", this will lock the editor. Once you put in the closing brace and hit the enter key you can go back and edit any errors without any problems. (It is a program bug with BlueJ).

```
// Java Tutorial 3  Math and Time

// This program performs some mathematical computations and displays the
// results. It also displays the value of the constant Math.PI. It then
// reports the number of seconds that the computer spent on this task
```

```
// Mr. Ellsworth   Period: 0   November 1, 2017

public class MathAndTime
{
   public static void main(String[] args)
   {
      // Declare Variables

      long startTime;              // Starting time of program, in ms
      long endTime;                // Time when computations are done, in ms
      double time;                 // Time difference, in seconds
      double width;                // Sides of a triangle
      double height;
      double hypotenuse;

      // get system time
      startTime = System.currentTimeMillis();

      // calculate the hypotenuse of a rigth triangle
      width = 42.0;
      height = 17.0;
      hypotenuse = Math.sqrt(width * width + height * height);

      System.out.print("\nA triangle with sides 42 and 17 has hypotenuse ");
      System.out.println(hypotenuse);

      // test sin x and cos x
      System.out.println("\nMathematically, sin(x) * sin(x) + "
                  + "cos(x) * cos(x) - 1 should be 0.");
      System.out.println("\nLet's check this for x = 1:");
      System.out.print("      sin(1) * sin(1) + cos(1) * cos(1) - 1 is ");
      System.out.println(Math.sin(1) * Math.sin(1) + Math.cos(1) * Math.cos(1) - 1);
```

```
        System.out.println("There can be round-off errors when computing with real numbers!");

        // Get a random number
        System.out.print("\nHere is a random number: ");
        System.out.println(Math.random());

        // The constant value for PI
        System.out.print("\nThe value of Math.PI is ");
        System.out.println(Math.PI);

        // Calculate processing time
        endTime = System.currentTimeMillis();
        time = (endTime - startTime);

        System.out.print("\nRun time in milliseconds was: ");
        System.out.println(time);

    } // end of method main
} // end of class MathAndTime
```



Step 8: Click on the Compile button and the program will be compiled. If there are any errors correct the errors and compile the program again.

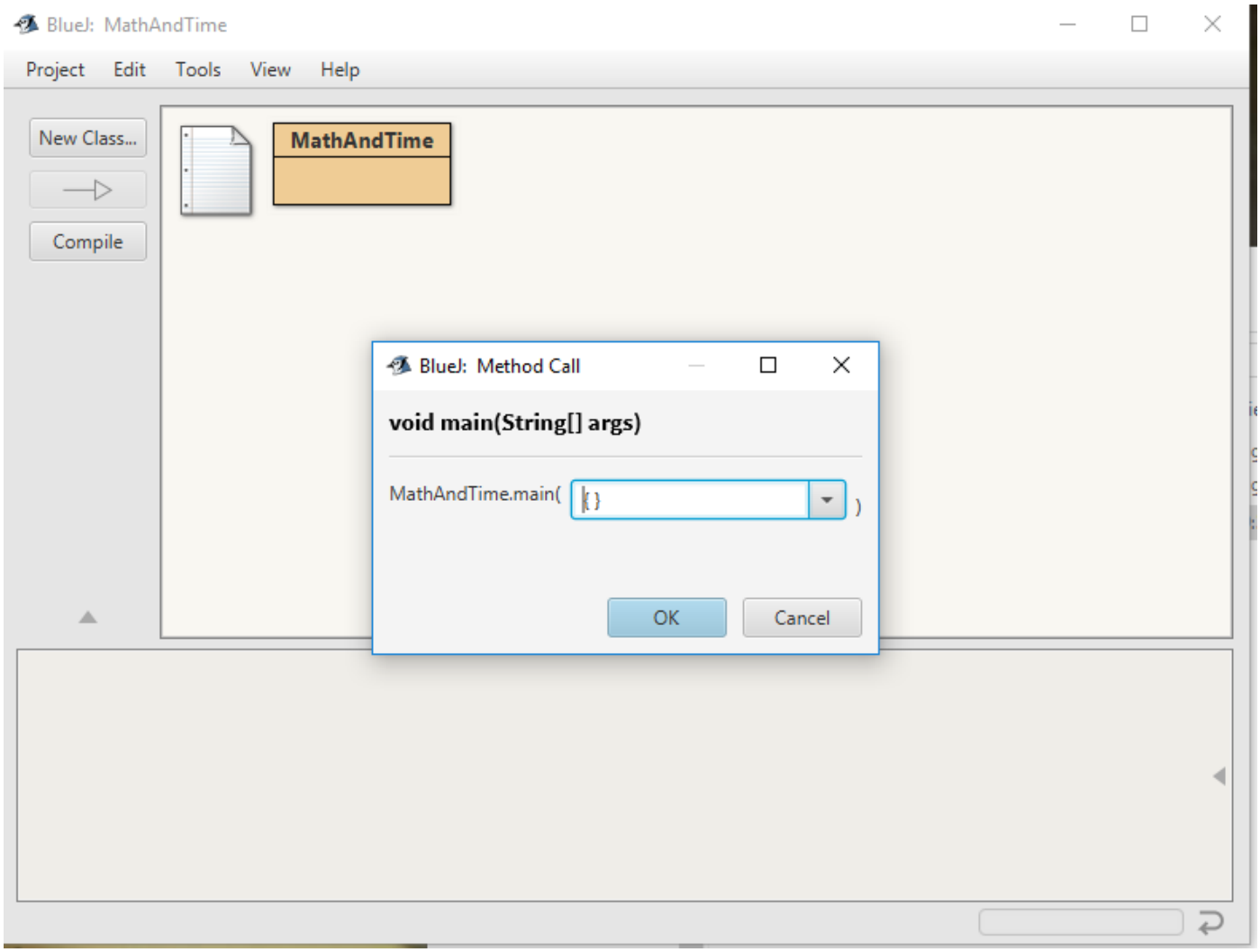
Step 9: Minimize the editor by click on the "_" button in the upper right hand corner of the screen.

Step 10: Right click on the MathAndTime box and a drop down menu will appear.

Step 11: Click on void main(String[] args) to start the program.

Step 12: Click on the OK button to run the program.

Step 13: A BlueJ Terminal Window will open and you will see the output displayed.



A triangle with sides 42 and 17 has hypotenuse 45.31004303683677

Mathematically, sin(x) * sin(x) + cos(x) * cos(x) - 1 should be 0.
Let's check this for x = 1:

sin(1) * sin(1) + cos(1) * cos(1) - 1 is 0.0

There can be round-off errors when computing with real numbers!

Here is a random number: 0.10349055527021911

The value of Math.PI is 3.141592653589793

Run time in milliseconds was: 1.0