# Maths Game – in Java

Firstly we need to open an IDE (Integrated Development Environment). This enables you to enter the code and run it. We are using Eclipse for this exercise. Instrcutions on downloading and installing Eclipse if you want to try this at home are at : http://www.eclipse.org

Create a **project** > and then a **Java class** (a class is where you will type the Java code) – as shown here …
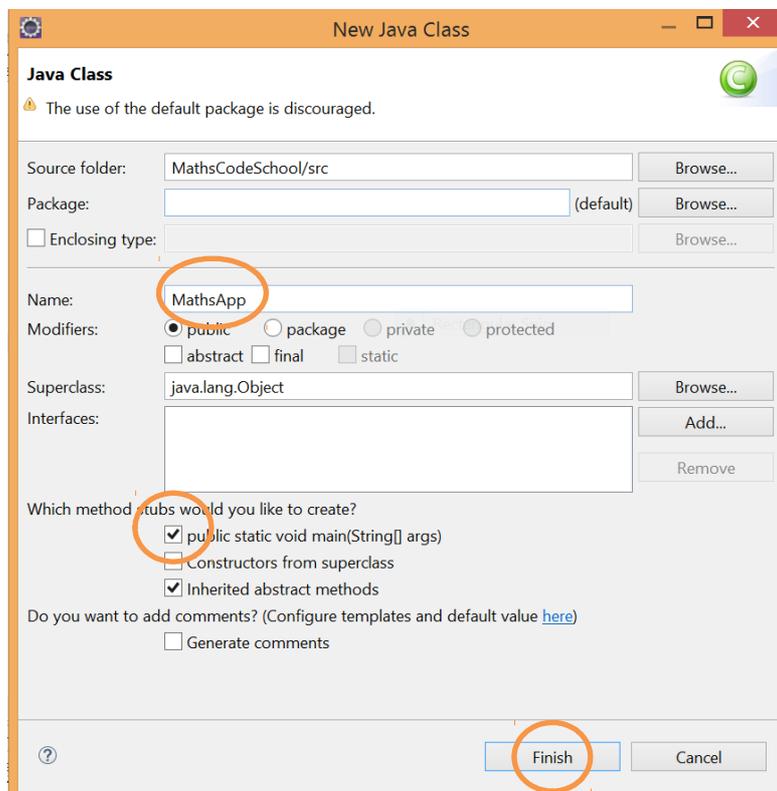
Entering the code…

The class should now look like this…

```java
public class MathsApp {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

    }

}
```

Your code will be entered here – this is called the main method

Creating variables

We need to have several variables to hold the game score, the numbers used in the multiplication sum and the user's answer.

```java
public static void main(String[] args) {
    // creating variable to hold the game score
    int score, num1, num2, userAnswer;

    // setting the variables to initial values
    score = 0;
    num1=0;
    num2=0;
    userAnswer=0;



}
```

Enter the following code – Java is case sensitive so you'll have to enter it as it appears here

Getting input from the user

To ask the user for the answer to a sum we need to use some functionality that's already available in the Java langauage

```java
import java.util.Scanner;


public class MathsApp {

    public static void main(String[] args) {
        // creating variable to hold the game score
        int score, num1, num2, userAnswer;

        // setting the variables to initial values
        score = 0;
        num1=0;
        num2=0;
        userAnswer=0;

        Scanner scanner = new Scanner(System.in);

    }
}
```

Enter the following code – to use the Java Scanner class.

Some output to the user …

```java
    public static void main(String[] args) {
        // creating variable to hold the game score
        int score, num1, num2, userAnswer;

        // setting the variables to initial values
        score = 0;
        num1=0;
        num2=0;
        userAnswer=0;

        Scanner scanner = new Scanner(System.in);
        System.out.println("Starting the game");
        System.out.println("10 multipication sums... ");
```

These lines will output text to screen. Enter these and run your program....

TRY IT

Now the game – we need something to get a random numbers and a loop to run 10 times

```java
import java.util.Scanner;
import java.util.Random;

public class MathsApp {

    public static void main(String[] args) {
        // creating variable to hold the game score
        int score, num1, num2, userAnswer;

        // setting the variables to initial values
        score = 0;
        num1=0;
        num2=0;
        userAnswer=0;

        Scanner scanner = new Scanner(System.in);
        System.out.println("Starting the game");
        System.out.println("10 multipication sums... ");

        // need this to source the random numbers
        Random random = new Random();

        // the game loop - runs 10 times
        for (int loop = 1; loop <= 10; loop++) {
            // all lines of code in here will run ten times
        }
    }
}
```

Enter these new lines

TRY IT

Let's now generate the sum and ask the user for the answer

```java
import java.util.Scanner;
import java.util.Random;

public class MathsApp {

    public static void main(String[] args) {
        // creating variable to hold the game score
        int score, num1, num2, userAnswer;

        // setting the variables to initial values
        score = 0;
        num1=0;
        num2=0;
        userAnswer=0;

        Scanner scanner = new Scanner(System.in);
        System.out.println("Starting the game");
        System.out.println("10 multipication sums... ");

        // need this to source the random numbers
        Random random = new Random();

        // the game loop - runs 10 times
        for (int loop = 1; loop <= 10; loop++) {
            // get the first random  number between 1 and 10
            num1 = random.nextInt(10) + 1;
            // get the second random  number between 1 and 10
            num2 = random.nextInt(10) + 1;
            System.out.println(num1 +" * "+num2 +" =");
            // get the user's answer
            userAnswer = scanner.nextInt();
        }
    }
}
```

Get each number (both of which are randomly generated from 1 to 10).

Show the sum to the user.

Then get the user's guess.

TRY IT

Checking the user's answer

```java
// the game loop - runs 10 times
for (int loop = 1; loop <= 10; loop++) {
    // get the first random  number between 1 and 10
    num1 = random.nextInt(10) + 1;
    // get the second random  number between 1 and 10
    num2 = random.nextInt(10) + 1;
    System.out.println(num1 +" * "+num2 +" =");
    // get the user's answer
    userAnswer = scanner.nextInt();

    // check if correct
    if (userAnswer == num1*num2){
        // answer correct
        System.out.println("Right");
        // update the score
        score++;
    } else {
        System.out.println("Wrong");
    }
}
```

Using an IF ELSE to check the answer and output an appropriate message

TRY IT

```java
import java.util.Scanner;
import java.util.Random;

public class MathsApp {

    public static void main(String[] args) {
        // creating variable to hold the game score
        int score, num1, num2, userAnswer;

        // setting the variables to initial values
        score = 0;
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        Scanner scanner = new Scanner(System.in);
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            System.out.println(num1 +" * "+num2 +" =");
            // get the user's answer
            userAnswer = scanner.nextInt();




            // check if correct
            if (userAnswer == num1*num2){
                // answer correct
                System.out.println("Right");
                // update the score
                score++;
            } else {
                System.out.println("Wrong");
            }
        }
        //game over
        System.out.println("You got : "+score);
        System.out.println("Game over");
    }
}
```

```
Starting the game
10 multipication sums...
8 * 2 =
16
Right
2 * 6 =
12
Right
5 * 6 =
30
Right
7 * 8 =
56
Right
3 * 7 =
21
Right
2 * 6 =
12
Right
4 * 3 =
12
Right
7 * 2 =
14
Right
8 * 9 =
44
Wrong
5 * 9 =
45
Right
You got : 9
Game over
```

```java
        // check if correct
        if (userAnswer == num1*num2){
            // answer correct
            System.out.println("Right");
            // update the score
            score++;
        } else {
            System.out.println("Wrong");
        }
    }
    //game over
    System.out.println("You got : "+score);
    System.out.println("Game over");
    }
}
```

TRY IT
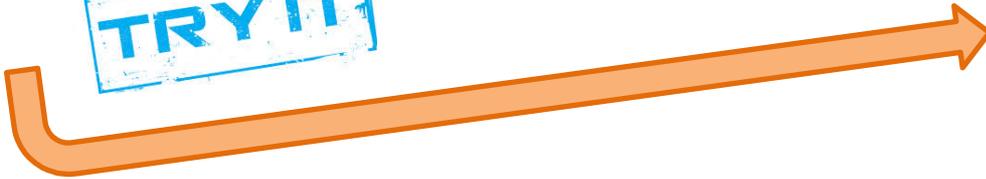
Possible updates …

1. If the user gets a sum incorrect – show then the right answer.

2. When the game starts prompt the user to enter his / her name. Then output a message at the end of the game saying something like … "You scored **5** out of **10** *<username>*".   You will need to user scanner.next() to read the name from the user and store it in a String var eg. **String username**

3. Grade the user score… add a message to the score given to the user

Score	Graded message
0 - 2	You really need to go to after schools Maths classes
3- 6	Not great – keeping working
7 -9	Great stuff Einstein
10	You must have really great Maths teachers!