

We will create a game which guesses a number between 1 and 100. The purpose of this project is to review the material from Savitch chapter 1 through 4. Create one directory called `P7_Guess` to store the `.java` files. Due Wednesday, September, 25, 2019, before 11:59 PM. Zip and send source code of all Java programs to via email to paul.bailey@basised.com. Please rename the zip file so it has your name on it. Also, put your name in a comment on the top of each program.

Program 1. Create a source file named `Guess0a.java`. Type in the following program which demonstrates the use of the standard library's `rand` function. Compile, run, and debug.

```
import java.util.Random;

public class Guess0a
{
    private static Random random = new Random();

    private static void play()
    {
        int n = random.nextInt(100) + 1;
        System.out.printf("I picked %d\n", n);
    }

    public static void main(String[] args)
    {
        play();
    }
}
```

Program 2. Copy `Guess0a.java` to `Guess0b.java` and modify it to the following program which demonstrates the use of the `while` statement. Compile, run, and debug.

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

public class Guess0b
{
    private static Random random = new Random();
    private static Scanner scanner = new Scanner(System.in);

    private static void play()
    {
        int n = random.nextInt(100) + 1;
        int k = 0;
        System.out.printf("I picked %d\n", n);
        while (++k <= 10)
        {
            int g = 0;
            System.out.printf("Guess: ");
            g = scanner.nextInt();
            System.out.printf("%2d) You guessed %d\n", k, g);
        }
    }

    public static void main(String[] args)
    {
        play();
    }
}
```

Program 3. Copy the `Guess0b.java` source file and rename it `Guess1.java`. Modify the program so that it becomes a guessing game as followings:

- (a) The computer thinks of a number between one and one hundred.
- (b) The human guesses a number.
- (c) The computer tells the human if the guess is high or low and returns to (b).
- (d) If the guess is correct, the computer tells the human the guess is correct and stops.

Program 4. Create a program `Guess2.java` which is a guessing game in which the human writes a number between 1 and 100 on a piece of paper, and the computer guesses the number by a series of guesses. For each guess, the human tells the computer if it is high, low, or correct. Begin by typing, compiling, and debugging the following code.

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

public class Guess2
{
    private static Scanner scanner = new Scanner(System.in);

    private static void help()
    {
        System.out.printf("Enter H for High\n");
        System.out.printf("      L for Low\n");
        System.out.printf("      C for Correct\n");
        System.out.printf("      Q to Quit\n");
    }

    private static void play()
    {
        String s = "";
        int a = 1;          // n >= a
        int b = 100;       // n <= b

        while (true)
        {
            char c = '@';
            int g = 1;
            // Set g to be a guess between a and b
            System.out.printf("Guess %d: ", g);
            s = scanner.next();
            c = (char)s.charAt(0);
            // If c is '?' help
            if (c == '?') help();
            // If c is 'Q' quit
            if (c == 'Q') break;
            // If c is 'C' say "You won!" and quit
            // If c is 'L' adjust a
            // If c is 'H' adjust b
        }
    }

    public static void main(String[] args)
    {
        System.out.printf("Select a number between 1 and 100.\n");
        help();
        play();
    }
}
```