

Student Number: x23285508
Module Name: Software Development (HDSDEV JAN24)
Week 7 Lab Submission
Question 2 and then 1

File - /Users/seanwelch/programming/labs/Week7Lab/src/guessing/Guessing.java

```
1 package guessing;
2
3 import java.util.Arrays;
4 import java.util.Scanner;
5
6 public class Guessing {
7     private final Scanner scanner;
8
9     public Guessing(Scanner scanner) {
10         this.scanner = scanner;
11     }
12
13     private int generateRandomNumber() {
14         return (int) (Math.random() * 10) + 1;
15     }
16
17     private int generateUserGuess() {
18         int userGuess;
19
20         while (true) {
21             userGuess = scanner.nextInt();
22             scanner.nextLine();
23
24             if (userGuess > 0 && userGuess < 11) {
25                 break;
26             } else {
27                 System.out.println("Invalid Guess, must be greater than 0 and less than 10.");
28             }
29         }
30
31         return userGuess;
32     }
33
34     private boolean checkResult(int userGuess, int generatedNumber) {
35         if (userGuess == generatedNumber) {
36             System.out.println("Correct, You Win");
37         } else {
38             System.out.println("Incorrect, try again!");
39             if (userGuess > generatedNumber) {
40                 System.out.println("Hint: Your guess was too high.");
41             } else {
42                 System.out.println("Hint: Your guess was too low.");
43             }
44         }
45
46         return userGuess == generatedNumber;
47     }
48
49     private int[] checkFinalResults(int[] userGuesses) {
50         int length = userGuesses.length;
51
52         for (int guess: userGuesses) {
53             if (guess == 0) length--;
54         }
55
56         int[] finalResults = new int[length];
57
58         System.arraycopy(userGuesses, 0, finalResults, 0, finalResults.length);
59
60         return finalResults;
61     }
62
63     // public constructor method for private fields
64     public void initGuessingGame() {
65         int maxAttempt = 5;
66         int currAttempt = 1;
67
68     }
```

```
69     int randomNumber = generateRandomNumber();
70
71     boolean guessCorrect = false;
72     int[] userGuesses = new int[maxAttempt];
73
74     while (currAttempt <= maxAttempt) {
75         System.out.println("Attempt " + currAttempt + " of " + 5);
76         System.out.println("-----");
77
78         int userGuess = generateUserGuess();
79         userGuesses[currAttempt - 1] = userGuess;
80
81         boolean result = checkResult(userGuess, randomNumber);
82
83         if (result) {
84             guessCorrect = true;
85             break;
86         } else {
87             currAttempt++;
88         }
89     }
90
91     if (!guessCorrect) {
92         System.out.println("-----");
93         System.out.printf("You ran out of attempts! The number was: %s\n", randomNumber);
94         System.out.println("-----");
95     }
96
97     int[] finalResults = checkFinalResults(userGuesses);
98
99     System.out.println("-----");
100    System.out.printf("User Guesses: %s\n", Arrays.toString(finalResults));
101    System.out.println("-----");
102 }
103 }
```

File - /Users/seanwelch/programming/labs/Week7Lab/src/guessing/GuessingApp.java

```
1 package guessing;
2
3 /*
4  Question 2
5  Alter the guessing game application so that every time it plays the user is asked do they want to play again.
6  Depending on what the user enters the application should keep going until they wish to stop.
7  Bonus: store the user guesses and return them to the user when they finish or win.
8  Note this may necessitate the creation of a large blank array
9  */
10
11 import java.util.InputMismatchException;
12 import java.util.Scanner;
13
14 public class GuessingApp {
15     public static void main(String[] args) {
16         try (Scanner scanner = new Scanner(System.in)) {
17             Guessing guessing = new Guessing(scanner);
18
19             boolean playAgain = true;
20             System.out.println("Try guess the same number as the computer... " +
21                 "Pick a random number between 1 and 10: ");
22
23             while (playAgain) {
24                 guessing.initGuessingGame();
25
26                 boolean validInput = false;
27                 while (!validInput) {
28                     System.out.println("Would you like to play again? (y/n): ");
29                     System.out.println("-----");
30                     String userInput = scanner.nextLine().toLowerCase();
31
32                     if (userInput.equals("n") || userInput.equals("no")) {
33                         System.out.println("-----");
34                         System.out.println("Okay, bye!");
35                         playAgain = false;
36                         validInput = true;
37                     } else if (userInput.equals("y") || userInput.equals("yes")) {
38                         validInput = true;
39                     } else {
40                         System.out.println("Input is not valid. Please confirm with (y/n)!");
41                     }
42                 }
43             }
44         } catch (InputMismatchException err) {
45             System.out.println("An error was made along the way, please try again: " + err);
46         }
47     }
48 }
```

```
1 package subjects;
2
3 import java.util.Arrays;
4 import java.util.Scanner;
5
6 public class Subjects {
7     private final Scanner scanner;
8
9     public Subjects(Scanner scanner) {
10         this.scanner = scanner;
11     }
12
13     public enum SubjectOptions{
14         MATH, PHYSICS, BIOLOGY, HISTORY, RELIGION, PROGRAMMING, ACCOUNTING, FINANCE
15     }
16
17     private int chooseSubjectsNumber() {
18         int chosenSubjects;
19
20         while (true) {
21             System.out.println("How many subjects do you take?");
22             chosenSubjects = scanner.nextInt();
23
24             if (chosenSubjects > 0 && chosenSubjects < 9) {
25                 scanner.nextLine();
26                 break;
27             } else {
28                 System.out.println("Error: please choose from 1-8 subjects, try again!");
29             }
30         }
31         return chosenSubjects;
32     }
33
34     private boolean validateSubjectOptions(String input) {
35         for (SubjectOptions option: SubjectOptions.values()) {
36             if (option.name().equalsIgnoreCase(input)) {
37                 return true;
38             }
39         }
40         return false;
41     }
42
43     private String[] chooseSubjectOptions(int numberSubjects) {
44         System.out.printf("You're currently enrolled in %s subjects. Please list them below: %n", numberSubjects);
45         System.out.println("-----");
46
47         for (SubjectOptions subjectOptions: SubjectOptions.values()) {
48             System.out.println(subjectOptions.name());
49         }
50         System.out.println("-----");
51
52         String[] chosenSubjects = new String[numberSubjects];
53
54         for(int i = 0; i < numberSubjects; i++) {
55             System.out.println("Enter Subject " + (i + 1) + ": ");
56             String input = scanner.nextLine();
57
58             while (!validateSubjectOptions(input)) {
59                 System.out.println("Invalid Subject, please choose from an option in the aforementioned list");
60                 System.out.println("Enter Subject" + (i + 1) + ": ");
61                 input = scanner.nextLine();
62             }
63
64             chosenSubjects[i] = input;
65         }
66
67         return chosenSubjects;
68     }
69 }
```

```

69
70     private boolean confirmSubjectChoices(String[] chosenSubjects) {
71         System.out.println("You're enrolled in: " + Arrays.toString(chosenSubjects) + " Is this correct?: (y/n)");
72
73         while (true) {
74             String input = scanner.nextLine().toLowerCase();
75             if (input.equals("y") || input.equals("yes")) {
76                 return true;
77             } else if (input.equals("n") || input.equals("no")) {
78                 return false;
79             } else System.out.println("Input is not valid. Please confirm with (y/n)!");
80         }
81     }
82
83     private int[] getSubjectResults(String[] chosenSubjects) {
84         System.out.println("-----");
85         System.out.println("Enter your results for each subject...");
86         int[] subjectResults = new int[chosenSubjects.length];
87
88         for (int i = 0; i < chosenSubjects.length; i++) {
89             System.out.println("What Grade did you get in: " + chosenSubjects[i]);
90             while (true) {
91                 int grade = scanner.nextInt();
92                 scanner.nextLine();
93
94                 if (grade >= 0 && grade <= 100) {
95                     subjectResults[i] = grade;
96                     break;
97                 } else {
98                     System.out.println("Please enter a valid grade between 0-100!");
99                 }
100             }
101         }
102
103         return subjectResults;
104     }
105
106     private void displaySubjectsAndGrades(String[] chosenSubjects, int[] subjectResults) {
107         if (chosenSubjects.length != subjectResults.length) {
108             System.out.println("Mismatch in results and subjects data: length is not equal!");
109             return;
110         }
111
112         System.out.println("-----");
113         System.out.printf("Here are your final results: %n");
114
115
116         for (int i = 0; i < chosenSubjects.length; i++)
117             System.out.printf("(Subject: %s, Result: %s) %n", chosenSubjects[i], subjectResults[i]);
118     }
119
120     private int getSubjectAverage(int[] subjectResults) {
121         int sum = 0;
122
123         for (int result: subjectResults) {
124             sum += result;
125         }
126
127         return sum / subjectResults.length;
128     }
129
130     public int collectSubjectsData() {
131         int averageGrade;
132
133         while (true) {
134             int numSubjects = chooseSubjectsNumber();
135             System.out.println("-----");
136             String[] chosenSubjects = chooseSubjectOptions(numSubjects);

```

File - /Users/seanwelch/programming/labs/Week7Lab/src/subjects/Subjects.java

```
137         System.out.println("-----");
138
139         if (confirmSubjectChoices(chosenSubjects)) {
140             int[] subjectResults = getSubjectResults(chosenSubjects);
141             System.out.println("-----");
142             displaySubjectsAndGrades(chosenSubjects, subjectResults);
143
144             averageGrade = getSubjectAverage(subjectResults);
145             break;
146         } else {
147             System.out.println("Let's restart the subject selection process.");
148         }
149     }
150
151     return averageGrade;
152 }
153 }
```

File - /Users/seanwelch/programming/labs/Week7Lab/src/subjects/SubjectsApp.java

```
1 package subjects;
2
3 /*
4  Question 1:
5  Create an application that asks a user to enter how many subjects they have.
6  The application should then ask the user to enter the results for each subject.
7  Store these results in an array and print them back to the user
8  along with their overall average and grade for each module.
9  */
10
11 import java.util.InputMismatchException;
12 import java.util.Scanner;
13
14 public class SubjectsApp {
15     public static void main(String[] args) {
16         try (Scanner scanner = new Scanner(System.in)) {
17             Subjects subjects = new Subjects(scanner);
18
19             int maxRetries = 3;
20             boolean success = false;
21
22             while (!success && maxRetries > 0) {
23                 try {
24                     int averageGrade = subjects.collectSubjectsData();
25                     System.out.println("-----");
26                     System.out.printf("Average Grade: %s\n", averageGrade);
27                     success = true;
28                 } catch (Exception err) {
29                     System.out.println("Error: " + err.getMessage());
30                     System.out.println("Try again!");
31                     maxRetries--;
32                 }
33             }
34
35             } catch (InputMismatchException err) {
36                 System.out.println("An error was made along the way, please try again: " + err);
37             }
38         }
39     }
40
41 }
```