

Code-Writing Quiz 2

The goal of code-writing quizzes is to help students gain fluency and confidence in their code-writing.

During the quiz students will be given 1 – 3 very short problems and about 15 min. to implement the solution with a pencil/pen on a piece of paper. Then each student will be randomly paired with a peer and the peers will assess each-other's work. All the errors must be marked with a red pen and the quiz will be graded according to a simple rubric. The rubric will be provided. Instructor will collect all the quizzes to quickly check on the works and to post grades in the gradebook.

Students are expected to write syntactically and logically correct Java code. Import statements and main() method heading will not be needed though.

The quiz is closed-book, no-computer-access type of exercise. Students are encouraged to prepare notes on a 3x5 inch index card using both sides. That card is the only reference students can use during the quiz and eventually during the midterm and final exams. It is necessary to spend time practicing for the quiz. It's close to impossible to do well on such a quiz without prior practice. Problems provided below are very similar to the one(s) that will be appearing on the quiz.

If the student missed the quiz and wants to get credit for it, he/she must submit to the instructor hand-written code solutions to all the sample problems listed in the quiz preparation guide.

Topics to Review

- Exceptions basics – how to catch an exception of specified type.
- User input validation
 - Validating the range of values
 - Validating the TYPE of value with the help of try/catch block and exceptions
- File I/O
 - Opening text file for reading, reading from a text file all the lines using a loop, closing the text file
 - Opening text file for writing, writing into the file using a loop, closing the text file
 - Catching I/O exceptions
- Generating random numbers in a given range
- Simple data analysis:
 - Find the total (sum) of all the numbers
 - coming from user input or
 - generated with random number generator
 - Find the smallest and largest number in a set coming from
 - coming from user input or
 - generated with random number generator

Sample problems

1. Ask user to provide an integer in the range from 1 to 100. Validate user input: make sure user provides number in the given range AND that the input provided is of integer type. Use

validation loop to prevent user from moving on until the value of correct type and range is provided.

2. Generate 200 numbers in the range from 5 to 55. Print them out on the screen.
3. Generate 100 random numbers in the range from 1 to 10. Calculate the sum of the numbers and print it into the screen.
4. Generate 100 random numbers in the range from 1 to 10. Print into the screen only even numbers out of those that were generated.
5. Generate 100 random numbers in the range from 1 to 10. Find out how many times number 3 has been generated. Output that info into the screen.
6. Use loop to ask user to input an integer number 25 times. Find the total of all the numbers the user entered. No input validation is required.
7. Use loop to ask user to input an integer number 50 times. Find the smallest and the largest of all the numbers the user entered. No input validation is required.
8. Open text file named "myFile.txt" for reading. Print the contents of the file into the screen. (Close the file). Catch and handle I/O exceptions.
9. Open text file named "numbers.txt" for writing. Write all even integers in the range 1 – 100 into the file. (Close the file) Catch and handle I/O exceptions.

I assume you know all topics from Quiz 1 and remember how to solve problems listed below.

OLD Topics to Review

- Input using Scanner object to input integers, doubles, and lines from keyboard
- Output using .println() method
- Calculation of any sort
- Use Java formatting to format output and use printf() method to manipulate the output appearance and formatting.
- Using if, if/else, is/else if, switch and nested if statements
- Logical operators and Boolean logic
- Using simple "while" and "for" loops for repetition.

OLD Sample Problems

1. Get two values from the user input, width and length of the rectangle, and calculate the rectangle area using formula $\text{area} = \text{width} * \text{length}$. Output the resulting value showing two digits after the decimal point.
2. Input three numbers from the user. Use nested "if" statements to print them out in order from the smallest to the largest.
3. Write a loop that prints "Hello WORLD!" 10 times.
4. Use a loop to ask user to input 20 integers, one at a time. Analyze the input as it comes and print out the number only if it is even.
5. Use loop to output numbers 1 – 100 and their squares. Use Java formatting and printf() to organize output in two columns: Number and Square.

6. Use “for” loop to output a table of Celsius temperatures and their Fahrenheit equivalents. Make Celsius temperatures change from -10 to 40 degrees with a step of 5. For conversion use the following formula. Beware of integer division!

$$T_{(^{\circ}\text{F})} = T_{(^{\circ}\text{C})} \times 9/5 + 32$$

7. Use Java formatting and printf() to output number double k = 345.6789 in a field that is 10 spaces wide and rounded to 2 decimal places.