This assignment contains 5 pages (including this page) and 42 questions. Check to see if any pages are missing.

These pages are indexed to the videos for this course.

Grading

Your answers must be hand-written on printed copies of the notes.

- This document will only be "spot checked." Not all answers may be graded.

- *Don't skip questions!* If you don't know an answer, at least give it a try. Or explain what you don't understand. Put a big star or arrow around the points you don't understand and ask about them in class.

- Keep your copy. When I make up the test I will go down the notes page and draw inspiration from these questions when making up the exam. These notes pages will be good study guides.

- You may write any lingering questions or muddy points at the end of the document. Then ask in class

- Scan this document into a .pdf file and turn it in. If you don't have access to a regular scanner then install a "CamScanner" app on your phone or tablet. They work pretty well. Photographs will not be accepted. You must scan to a .pdf document.

Video 02.035 Part 1

1. What import do you have to do to use the Scanner class?

2. What is the URL for the java API? I used version 17 in the video. Give the URL for the version of Java that you are using.

3. What constructor would we use if we want to read from a file?

4. What constructor will we use to read from a file?

5. What is the difference between a "method" and a "function?"

6. What data type is returned by each of the following? These are not answered at this point in the video. Use the API website to figure out the types that are returned.

   - nextDouble() returns a _____
   - nextInt() returns a _____
   - next() returns a _____
   - nextLine() returns a _____

7. Do you have to use the id "keyboard" when reading from the keyboard? Explain your answer.

8. What is the name of the InputStream used when reading from the keyboard. (Hint: The answer is not System.out)

9. What command would close a stream. Assume the Scanner is called "input."

10. what is the line of code that would be needed to do the following task?

    ```
    Read a double from the keyboard into a variable named x;
    ```

11. Given the above statement that reads a variable into x, what would happen if the user typed the following input.

    ```
    7.143   0202
    ```

12. What happens if a the user hits the Enter key or blank space when the Scanner is trying to read a number from the keyboard?

13. What happens if the user types a number with two decimal points. Perhaps something like 12.34.56 when the Scanner is trying to read a double (The video never does this, but you can probably guess. Also, you should be running a playground-type program running in IntelliJ so you should be able to confirm your answer.)

14. An exception has occurred.

15. Suppose Intellij produces the following error. What type of exception occured? What line number did the exception happen in?

    ```
    Exception in thread "main" java.util.InputMismatchException
    at java.base/java.util.Scanner.throwFor(Scanner.java:939)
    at java.base/java.util.Scanner.next(Scanner.java:1594)
    at java.base/java.util.Scanner.nextInt(Scanner.java:2258)
    at java.base/java.util.Scanner.nextInt(Scanner.java:2212)
    at App.main(App.java:16)
    ```

    What is the name of the exception?
    In your program, what line number generated the error?

16. What is the difference between next() and nextLine()?

17. What happens if you use next() to read from the keyboard, and the user types a number?

18. Write a complete program that prompts a user for an integer and reads it from the keyboard. It should also read a string from the keyboard. Include the necessary import You do NOT need to include the /**javadoc*/ comment.

Video 02.037 Other ways to Import

19. Write an example of the three different ways to import the Scanner class.

   1.
   2.
   3.

20. What does IntelliJ do when you tell it to "Optimize Imports?"

Video 02.040 Expressions

21. What is an expression?

22. List things that can be an expression

   •
   •
   •
   •

23. Can an expression contain an expression? **Give an example.**

Video 02.040 Part 02

24. Evaluate each of the following expressions using the Java "order of operations." Be sure to pay attention to data types.

- $1 + 2 * 3$
- $10/2$
- $5/2$
- $5./2.$
- $5/2.$
- $25/2 * 100$
- $25./50 * 100$
- $25/50. * 100$
- $25/50. * 100$
- $25/50 * 100.$

25. Explain why $1/2 * 5. * 2$ gives 0. as an answer, but $5. * 2 * 1/2$ gives 5.

Video 02.040 Part 03 Math Functions

26. What is the return type of most Math functions?

27. Write the Math function to return the square root of 99.

28. Write the Math function to return the absolute value of -99.

29. What does Math.random() return?

30. What is the smallest value that Math.random() return?

31. Math.random() can produce a number up to _____

32. What is the exponentiation operator in Java? (this is a trick question, because there isn't one. Oops. I just answered the question. Never mind. Move along.)

33. Write the expression that would return 4.4^2 in Java. Do it two different ways.

34. Write the expression that would return $3.4^{-2.7}$ in Java.

35. Write the expression that would return 2^{3^4} in Java. (That is, 2 raised to the 3rd raised to the 4th)
    Video 02.040 Part 04

36. What java function would return the length of a string? _____

37. What does the java trim() function do?

38. What is the *return type* of each of the following Java functions?

    - len() returns a _____
    - trim() returns a _____
    - equals() returns a _____
    - contains() returns a _____

39. Use the API to locate the "index of" a character in a string. What is the return type of this function?

40. What is the operator used to "concatenate" Strings? _____

41. What happens when you "concatenate" a String and a number?

42. What would be printed by the following code?

    ```
    System.out.println("3" + "3");
    ```