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| **Unit:** Language Basics | **Turn In List:** **1. This document** |
| *“I will understand and implement sequential file access.”* | |

**Title: Sequential File Access**

**Content Objectives:** Students will become familiar with how to access, read, write and manipulate external data.

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| **Starter Activity** |
| Research the difference between [sequential](http://en.wikipedia.org/wiki/Sequential_access) and [random](http://en.wikipedia.org/wiki/Random_access) file access: |

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| **Assignment:** |
| Students will use the following websites and internet searches to complete the table below:  Java: <http://www.tutorialspoint.com/java/java_files_io.htm>  C++: <http://www.tutorialspoint.com/cplusplus/cpp_files_streams.htm>  C#: <http://www.tutorialspoint.com/csharp/csharp_file_io.htm>  Python: <http://www.tutorialspoint.com/python/python_files_io.htm> and the final lesson of CodeAcademy |

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| **Include Sample Code or Explanation for the following Concepts Below (copy and paste lines from editor)** | |
| What is the proper syntax for opening a file stream? | FileInputStream in = new FileInputStream("input.txt");  FileOutputStream out = new FileOutputStream("output.txt"); |
| What is the syntax writing to a file? | out.write(c); |
| What is the proper syntax for closing a file stream? | in.close();  out.close(); |
| Where must the file reside in relation to your source code? | FileInputStream in = new FileInputStream("C:\\Users\\Student\\Documents\\input.txt"); |
| List and describe three modes or methods specific to your language that deal with writing or reading info to a file. | 1. FileInputStream : This reads the raw byte from a file. 2. FileOutputStream: This writes raw byte data to a file. 3. BufferedInputStream: This wraps file streams to buffer data and improve performance by reducing the number of disk I/O operations. |

Psuedocode an app that draws randomly from a string array of 10 open-ended thought provoking questions, whose answer is typed to the console by the user and stored in an “output.txt” file with question before it.

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| // Step 1: Create an array of 10 questions  questions ← [  "What did you eat for lunch today?",  "If you could be anything in the world, what would you be?”  "What do you want for your birthday?",  "What state do you live in?",  "Do you do any sports?",  "What do activity do you like to do in your free time?",  "Do you eat breakfast everyday?",  "What is the first things that comes to mind when I say school?",  "If you have all the money in the world, what would you do?",  "What are three superpowers you would like to have?"  ]  // Step 2: Generate a random number between 0 and 9  index ← RANDOM number between 0 and 9  // Step 3: Select a question using the random index  selectedQuestion ← questions[index]  // Step 4: Display the question to the user  PRINT selectedQuestion  // Step 5: Get user's typed answer  PRINT "Type your response below:"  userAnswer ← READ user input from console  // Step 6: Open "output.txt" in append mode  OPEN file "output.txt" FOR appending  // Step 7: Write question and answer to file  WRITE "Q: " + selectedQuestion TO file  WRITE "A: " + userAnswer TO file  WRITE newline TO file  // Step 8: Close the file |

Divide and conquer! Group leads may break the app into code blocks that accomplish small portions of the functionality mentioned above in pseudocode. Group leads will then take submissions through GitHub to piece together the master code for the group!

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| import java.io.File;  import java.io.FileWriter;  import java.io.IOException;  import java.util.Random;  import java.util.Scanner;  class ThoughtQuestionLogger {  public static void main(String[] args) {    String[] questions = {  "What motivates you every day?",  "If you could change one thing about the world, what would it be?",  "What does success mean to you?",  "Describe a time you overcame a difficult challenge.",  "What do you value most in a friendship?",  "What would you do if you knew you couldn't fail?",  "What does happiness look like for you?",  "What is something you're proud of and why?",  "If time and money weren't an issue, what would you do?",  "What advice would you give your future self?"  };    Random rand = new Random();  int index = rand.nextInt(questions.length); // Generate random index  String selectedQuestion = questions[index]; // Select the question  Scanner scanner = new Scanner(System.in);  System.out.println("Question: " + selectedQuestion);  System.out.print("Your answer: ");  String userAnswer = scanner.nextLine();  saveAnswerToFile(selectedQuestion, userAnswer);  scanner.close();  }    public static void saveAnswerToFile(String question, String answer) {  try {  FileWriter writer = new FileWriter("output.txt", true); // true means append to the file  writer.write("Q: " + question + "\n");  writer.write("A: " + answer + "\n\n");  writer.close();  System.out.println("Your response has been saved to output.txt.");  } catch (IOException e) {  System.out.println("An error occurred while writing to the file.");  e.printStackTrace();  }  }  } |