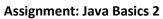# Assignment:
Java Basics 2

Overview:

This assignment has eight exercises, ranging between 15-45 minutes. You are expected to complete the course/ reference reading before attempting the exercise.

Learning Objective: The learning objectives are given in the table below.

S.No	Exercise	Description	Learning Objectives
1	Write a program that creates a new file called BatchMates.txt and store it in a directory named Batch. Also list the files or subdirectories present in the drive/directory where the directory Batch exists, stating if it is a file or directory.	This exercise is to write a java program to create a new file and check the file type and its parent directory, to check the absolute path of the file. List all the files of the present directory	After completion of this exercise, participant will be able to perform basic file operations, i.e. file creations, and file listing.
2	Write a program using byte stream that copies the content of one file into another file and print the number of characters, words and lines in the file.	This exercise is to write a java program using byte streams and perform a file copy and count the number of characters, words and lines in the file.	After completion of this exercise participant will be able to copy the contents of one file into other file and count the number of characters, words and lines in the file.
3	Create an object called employee whose attributes are emp_id, emp_name and emp_sal. Write a program to Serialize and deserialize the employee object except for the emp_sal attribute.	This exercise is to write a java program using object serialization and deserialization	After completion of this exercise participant will be able to write(serialize) the object details into a file and read(deserialize) the object details as and when needed

4	Write a code with 2 threads, 1st thread will display the no's from 1-10, 2nd thread will display the no's from 10-1.	This exercise is to write the java program using the concept of threads.	After completion of this exercise participant will be able to create 2 threads using Thread class and Runnable interface and display the natural numbers in forward and reverse order.
5	Your application uses 2 threads, 1st thread will display the Array List items in forward order, and 2nd thread will display the List items in reverse order.	This exercise is to write the java program to create 2 threads where 1 thread will display the array list items in forward order and 2nd thread will display the array list items in reverse order.	After completion of this exercise participant will be able to use threads to iterate values of an Array List in forward and reverse order.
6	In your application, save the person object (name and age) in an arraylist. Create 2 threads, where 1 thread will store person details in an arraylist, where other thread will read the person details from arraylist. During Fetch, check if the person age is less than 0, delete that person in array list.	This exercise is to write a java program to create 2 threads, where 1st thread will store a person data into a collection object, where the 2nd thread will read the person data from a collection object. During reading process, also delete a person based on a condition.	After completion of this exercise participant will be able to read and write an object details from/to a collection.
7	The main method waits to get input from the users until it is terminated. The input that it receives is any string. As soon as the main method receives the input it delegates the assignment of creating a password to a thread. The thread generates a random number and appends this number to the	This exercise is to write java application using a main thread and a child thread interaction	After completion of this exercise participant will be able to use and implement the use of parent thread and child thread and their interaction.

	string that is passed and displays the password. Write a java program to do this.		
8	10 volunteers are needed for Showcase of New Product. Write a program that will accept employee's ids who will volunteer for this. Make sure that the ids are not duplicates. Display the ids in a sorted order.	This exercise is to write java application using Set functionalities.	After completion of this exercise participant will be able to solve the problem statement using Collections and its implementation classes.
9	Write a program to implement a telephone directory. Provide facilities to add, delete and search the telephone directory	This exercise is to write java application using Map functionalities.	
10	Implement a railway ticket counter scenario where there are two queues- one general and one for senior citizen. Tickets are issued such that for every one person in senior citizen queue, two persons in general queue are processed. Write a program that takes input for 6 people who come at various points and print the list of people in the order of their processing sequence	This exercise is to write java application using Queue interface of java collections framework and its implementation classes	

IO Streams

Question No: 1
Exercise Objective(s): Using File and Directory

Exercise:

- Write a program that creates a new file called BatchMates.txt and store it in a directory named Batch. Also list the files or subdirectories present in the drive/directory where the directory Batch exists, stating if it is a file or directory.

Recommended duration: 30 minutes

Question No: 2
Exercise Objective(s): Using byte stream

Exercise:

- Write a program using byte stream that is copies the content of one file into another file and print the number of characters words and lines in the file.

Recommended duration: 45 minutes

Solution Guidance (if applicable): you may need to read and unread characters

Question No: 3
Exercise Objective(s): Using Serialization

Exercise:

- Create an object called employee whose attributes are emp_id, emp_name and emp_sal. Write a program to Serialize and deserialize the employee object except for the emp_sal attribute.

Recommended duration: 30 minutes

Solution Guidance (if applicable): you may need to read and unread characters

Multithreading

Question No: 4
Exercise Objective(s): using Java Threads

Exercise:
Write a code with 2 threads, 1st thread will display the no's from 1-10, 2nd thread will display the no's from 10-1.

Note: In the above activity, create threads using 2 different approaches.

   i)   Create threads by extending java.lang.Thread class ii)   Create threads by implementing java.lang.Runnable interface.
           Observe the difference in both the approaches and take a note of it.

Recommended duration: 45 mins

Solution Hint (if applicable):

Question No: 5
Exercise Objective(s): using Java Threads

Exercise:
Your application uses 2 threads, 1st thread will display the Array List items in forward order, and 2nd thread will display the List items in reverse order.

Recommended duration: 45 mins

Solution Hint (if applicable):   use java.util.ArrayList class

Question No: 6
Exercise Objective(s): using Java Threads

Exercise:

In your application, save the person object (name and age) in an arraylist. Create 2 threads, where 1 thread will store person details in an arraylist, where other thread will read the person details from arraylist. During Fetch, check if the person age is less than 0, delete that person in array list.

Recommended duration: 30 minutes

Solution Hint (if applicable):   use java.util.ArrayList class

Question No: 7
Exercise Objective(s): using Java Threads

Exercise:

- The main method waits to get input from the users until it is terminated. The input that it receives is any string. As soon as the main method receives the input it delegates the assignment of creating a password to a thread. The thread generates a random number and appends this number to the string that is passed and displays the password. Write a java program to do this.

Recommended duration: 45 minutes

Solution Guidance (if applicable):   Use java.util.Random class to generate random numbers.
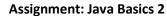
Collections framework

Question No: 8
Exercise Objective(s): Using Set

Exercise:

10 volunteers are needed for Showcase of New Product. Write a program that will accept employee's ids who will volunteer for this. Make sure that the ids are not duplicates. Display the ids in a sorted order.

Recommended duration: 20 minutes

Question No: 9

Exercise Objective(s): Using Map

Exercise:

> Write a program to implement a telephone directory. Provide facilities to add, delete and search the telephone directory

Recommended duration: 30 minutes

Solution Guidance (if applicable):

Question No: 10

Exercise Objective(s): Using Queue

Exercise:

- Implement a railway ticket counter scenario where there are two queues- one general and one for senior citizen.
- Tickets are issued such that for every one person in senior citizen queue, two persons in general queue are processed.
- Write a program that takes input for 6 people who come at various points and print the list of people in the order of their processing sequence.

Recommended duration: 30 minutes

Solution Guidance (if applicable):