Assignment 4

1. What's the difference between final, finally? What is finalize()?

Final keyword is used with the classes, methods and variables.
Finally block is always related to the try and catch block in exception handling.
finalize() method is used with the objects.

2. What's the difference between throw and throws?

Both throw and throws are the concepts of exception handing in which throw is used to explicitly throw an exception from a method or any block of code while throws are used in the signature of the method to indicate that this method might throw one of the listed type exceptions.

3. What are the two types of exceptions?

Checked Exception.
Unchecked Exception.

4. What is error in java?
Subclass of java Lang.Error refers to an illegal operation performed by the user which results in the abnormal working of the program.

5. Exception is object, true or false?
True

6. Can a finally block exist with a try block but without a catch?
Yes

7. From java 1.7, give an example of the try-resource feature.

```
static String readFirstLineFromFile(String path) throws IOException {
        try (FileReader fr = new FileReader(path);
            BufferedReader br = new BufferedReader(fr)) {
           return br.readLine();
        }
    }
```

8. What will happen to the Exception object after exception handling?

9. Can we use String as a condition in switch(str){} clause?
The Exception object will be garbage collected in the next garbage collection.

10. What's the difference between ArrayList, LinkedList and vector?

Their main difference is their implementation which causes different performance for different operations. arraylist is implemented as a resizable array. as more elements are added to arraylist, its size is increased dynamically. it's elements can be accessed directly by using the get and set methods, since arraylist is essentially an array. linkedlist is implemented as a double linked list. its performance on add and remove is better than arraylist, but worse on get and set methods. vector is similar with arraylist, but it is synchronized. arraylist is a better choice if your program is thread-safe. vector and arraylist require space as more elements are added. vector each time doubles its array size, while arraylist grow 50% of its size each time. linkedlist, however, also implements queue interface which adds more methods than arraylist and vector, such as offer(), peek(), poll(), etc.

11. What's the difference between hashTable and hashMap?

HashMap and Hashtable stores values in key-value pair. HashSet contains unique elements and HashMap, HashTable contains unique keys.

12. What is static import?
Static imports is used for program access the static members of a class directly without class name or any object.

13. What is static block?
A static block is a set of instructions that is run only once when a class is loaded into memory.

14. Explain the keywords:
default(java 1.8), break, continue, synchronized, strictfp, transient, volatile, instanceOf

Default Is used to specify the default block of code in a switch statement
Break Break the loop or switch statement
Continue Used to continue the loop
Synchronized Used to specify the critical sections or method in multithreaded code
Strictfp Used to restrict the floating-point calculations to ensure portability
Transient Is used in serialization
Volatile Is used to indicate that a variable may change asynchronously
instanceOf Used to test whether the object is an instance of the specified class or implement an interface

15. Create a program including two threads – thread read and thread write.
Input file ->Thread read -> Calculate -> buffered area
Buffered area -> Thread write -> output file
Detailed description is in assignment4.txt file.
Sample input.txt file.
Attached files are input.txt and a more detailed description file.

See file.