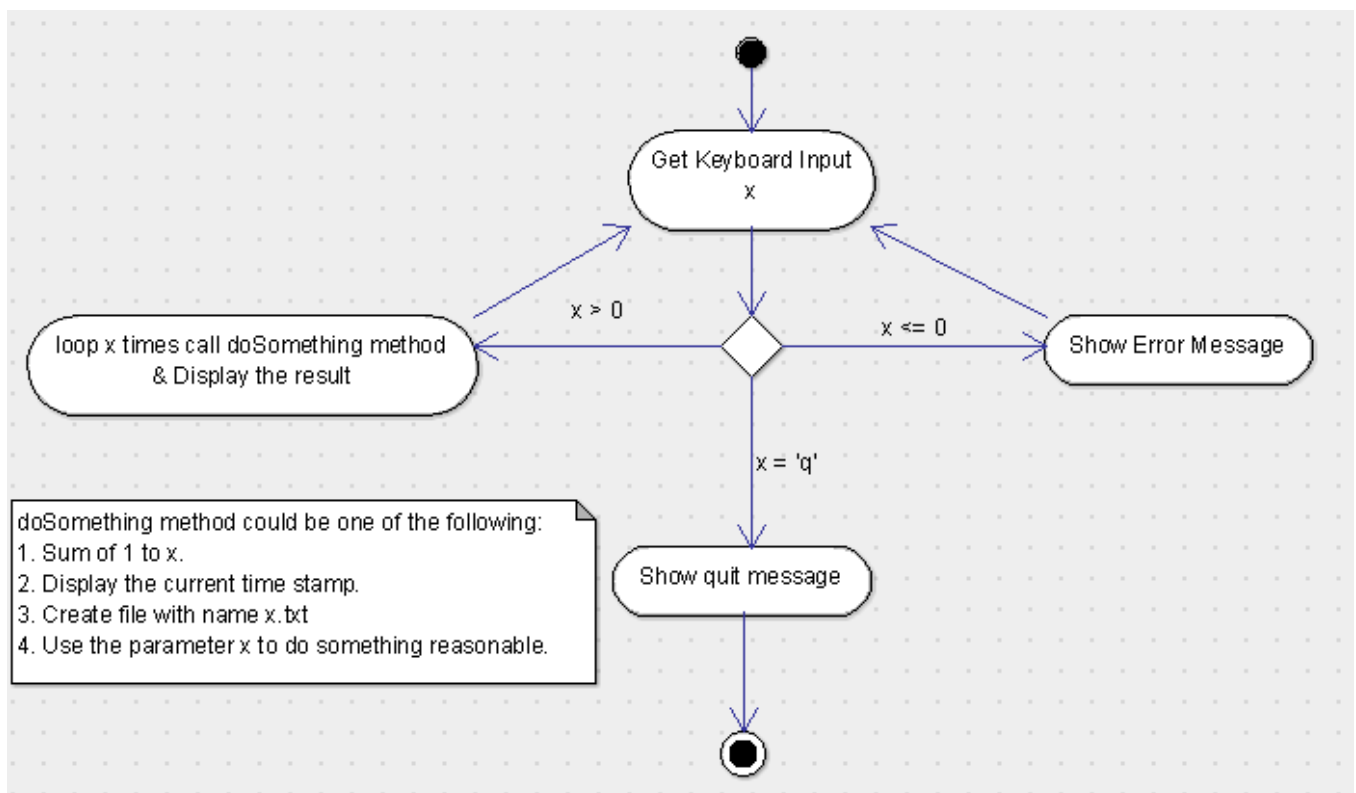**Assignment 1**

1. What is JDK? JRE? JVM?
2. What is java compiler?
3. Why is java platform independent?
4. What is IDE? Why is it important for developers?
5. Is java case sensitive?
6. What do the following key words do?
   static, final, public, private, void, null, package, Class, new
7. What is primitive type and reference type?
8. Is parameter passed by value or reference?
9. What is the output: System.out.println(1 > 0 : "A":"B");
10. How to define constants in java?
11. What is String? Is it primitive type?
12. How to check if a String is representing a number?
13. Write a program to implement the following activity diagram:

Get Keyboard Input
x

x > 0

loop x times call doSomething method
& Display the result

x <= 0

Show Error Message

x = 'q'

doSomething method could be one of the following:
1. Sum of 1 to x.
2. Display the current time stamp.
3. Create file with name x.txt
4. Use the parameter x to do something reasonable.

Show quit message

14. Write a program to merge two array of int.
15. Write a program to find the second largest number inside an array of int.

1. What is JDK? JRE? JVM?

JDK is an acronym for Java Development Kit. The Java Development Kit (JDK) is a software development environment which is used to develop Java applications and applets. It includes the Java Runtime Environment (JRE), an interpreter/loader (Java), a compiler (javac), an archiver (jar), a documentation generator (Javadoc), and other tools needed in Java development.

JRE is an acronym for Java Runtime Environment. It is also written as Java RTE. The Java Runtime Environment is a set of software tools which are used for developing Java applications. It is used to provide the runtime environment. It is the implementation of JVM. It physically exists. It contains a set of libraries + other files that JVM uses at runtime.

JVM (Java Virtual Machine) is an abstract machine. It is called a virtual machine because it doesn't physically exist. It is a specification that provides a runtime environment in which Java bytecode can be executed. It can also run those programs which are written in other languages and compiled to Java bytecode.

2. What is java compiler?

Java compilers are run and pointed to a programmer's code in a text file to produce a class file for use by the Java virtual machine (JVM) on different platforms.

3. Why is java platform independent?

Whenever, a program is written in JAVA, the javac compiles it. The result of the java compiler is the .class file or the bytecode. The bytecode generated is a non-executble code and needs an interpreter to execute on a machine. This interpreter is the JVM and thus the Bytecode is executed by the JVM. Different JVM is designed for different OS and byte code can run on different OS.

4. What is IDE? Why is it important for developers?

An IDE, or Integrated Development Environment, enables programmers to consolidate the different aspects of writing a computer program.

IDEs increase programmer productivity by combining common activities of writing software into a single application: editing source code, building executables, and debugging.

5. Is java case sensitive?

Yes, because lower- and upper-case letters are represented differently at the lowest levels.

6. What do the following key words do?
   static, final, public, private, void, null, package, Class, new

   static indicates that a variable or method is a class method (rather than being limited to one object).

   final indicates that a class is derived from another class or interface.

   public is an access specifier used for classes, interfaces, methods, and variables indicating that an item is accessible throughout the application.

   private is an access specifier indicating that a method or variable may be accessed only in the class it's declared in.

   void specifies that a method does not have a return value.

   null indicates that a reference does not refer to anything.

   package declares a java package.

   class declares a new class.

   new creates a new object.
7. What is primitive type and reference type?

   Primitive data are only single values and have no special capabilities, such as boolean, char, int, short, byte, long, float, and double.

   Reference type will contain a memory address of variable value because the reference types won't store the variable value directly in memory. They are strings, objects, arrays, etc.

8. Is parameter passed by value or reference?
   passed by value
9. What is the output: System.out.println(1 > 0 ? "A":"B");
   A
10. How to define constants in java?
    final
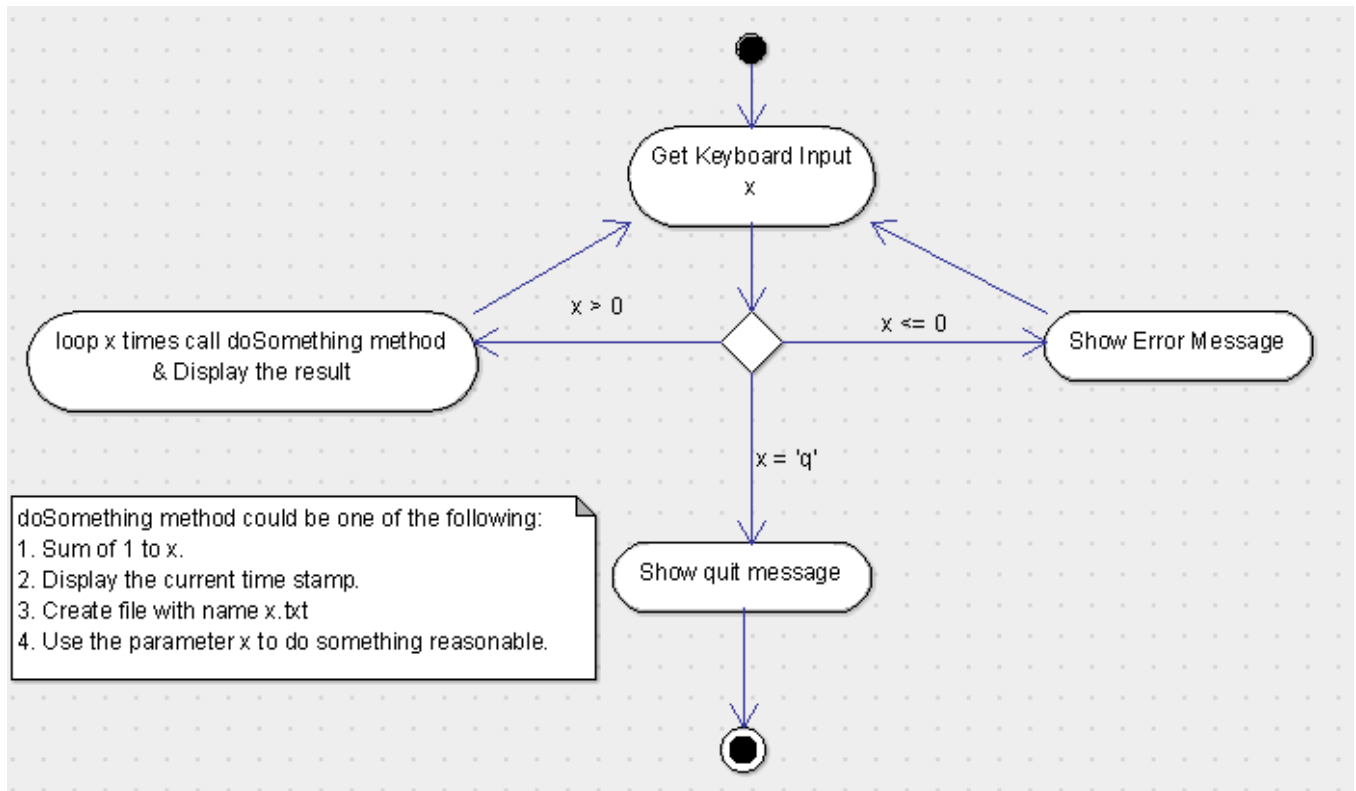11. What is String? Is it primitive type?
    Strings in Java are Objects that are backed internally by a char array. Since arrays are immutable (cannot grow), Strings are immutable as well. Whenever a change to a String is made, an entirely new String is created.

    No.

12. How to check if a String is representing a number?

```
try {
    Integer.parseInt( input );
    return true;
}
catch( NumberFormatExceptione ) {
    return false;
}
```

13. Write a program to implement the following activity diagram:

doSomething method could be one of the following:
1. Sum of 1 to x.
2. Display the current time stamp.
3. Create file with name x.txt
4. Use the parameter x to do something reasonable.

```java
public static void q1(){
    Scanner sc = new Scanner(System.in);
    int x = 0;
    while(sc.hasNextInt()){
        x = sc.nextInt();
        try{
            if(x <= 0) throw new RuntimeException();
            if(x > 0){
                for(int i = 0; i < x; i++){
                    doSomething(x);
                }
            }
        }catch(RuntimeException e){
            System.out.println("Negative Number");
        }
    }
}
```

```java
    if(sc.next().equals("q")){
        System.out.println("Bye");
        return;
    }
}

public static void doSomething(int x){
    System.out.println(new Date());
}
```

14. Write a program to merge two array of int.

```java
public static void q2(int[] a, int[] b){
    int[] res = new int[a.length+b.length];
    for(int i = 0; i < res.length; i++){
        if(i<a.length){
            res[i] = a[i];
        }else{
            res[i] = b[i-a.length];
        }
    }
    Arrays.stream(res).forEach(System.out::print);

}
```

15. Write a program to find the second largest number inside an array of int.

```java
public static void q3(int[] a){
    Arrays.sort(a);
    System.out.println(a[1]);

}
```