Security Injections @Towson

Security Injections, Java CS1 - Integer Error

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Laboratory Assignment

STEP 1: Type the program IntegerCheck from below. Compile and Run.

IntegerCheck

```
import java.util.Scanner;

public class IntegerCheck {

  public static void main(String[] args) {

    Scanner scan = new Scanner(System.in);
    int i;
    byte b;
    short sh;
    long lon;

    System.out.println("Valid integer is between " + Integer.MIN_VALUE + " and " +
 Integer.MAX_VALUE );
    System.out.println("Valid byte    is between " + Byte.MIN_VALUE + " and " + Byt
e.MAX_VALUE );
    System.out.println("Valid short   is between " + Short.MIN_VALUE + " and " + Sh
ort.MAX_VALUE );
    System.out.println("Valid long    is between " + Long.MIN_VALUE + " and " + Lon
g.MAX_VALUE );

  }

}
```

Question 1:

Examine the output. What is the largest possible integer value ?

- 1,000,000
- ✓ 2,147,483,647
- 2,000,000,000
- 32,767

Question 2:

Examine the output. What is the largest possible short integer ?

- 54,767
- 2,147,483,647
- 32,000
- ✓ 32,767

STEP 2: Type the lines below into the IntegerCheck program (after the last println statement).

```
System.out.print("Type an integer value: ");
i = scan.nextInt();
System.out.print("Type a byte value: ");
b = scan.nextByte();
System.out.print("Type a short value: ");
sh = scan.nextShort();
System.out.print("Type a long value: ");
lon = scan.nextLong();
System.out.println("\nYou entered the following values: ");
System.out.println("Integer: " + i);
System.out.println("Byte: " + b);
System.out.println("Short: " + sh);
System.out.println("Long: " + lon);
```

STEP 2.1: Compile and Run the program formed in step 2. Enter valid values at each prompt. For example, enter the smallest positive value for the short that leads to an error.

STEP 3: Add the following lines to the end of the program formed in step 2.

```
short newsh = (short)(sh * 10);
System.out.println("Ten * " + sh + " is " + newsh);
```

STEP 4: Compile and Run the program formed in step 3.

Question 3:

What happens when you enter 400 for short?

- Unexpected result
- Integer overflow occurs
- Program crashes
- ✓ Prints 4000

Question 4:

What happens when you enter 3277 for short?

- ✓ Integer overflow occurs
- 32,770 is printed
- Program crashes

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