



جامعة عفت
EFFAT UNIVERSITY

OOP - Spring 2022

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1 Objectives

- Using BigInteger and BigDecimal classes
- Implement String class

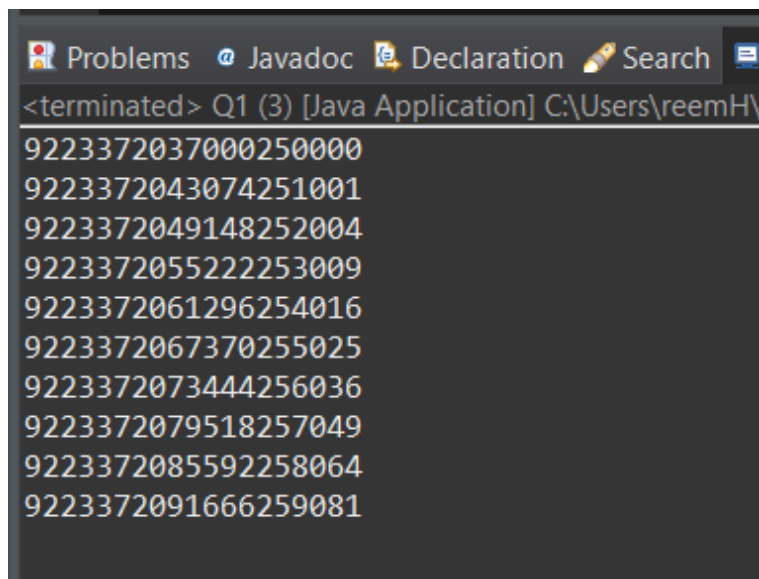
2 Questions

2.1 Question 1

- Code

```
import java.math.BigDecimal;
public class Q1
{
    public static void main(String[] args)
    {
        BigDecimal longMaxValue = new BigDecimal(Long.MAX_VALUE); // find Long.MAX_VALUE
        long firstValue = (long) Math.sqrt(Long.MAX_VALUE); // find the square root
        BigDecimal n = new BigDecimal(firstValue); // change the type to compare
        int i = 0;
        while (i < 10)
        {
            BigDecimal squareNum = n.multiply(n);
            if (squareNum.compareTo(longMaxValue) > 0) // comparing the values
            {
                i++;
                System.out.println(squareNum);
            }
            n = n.add(BigDecimal.ONE); // next n
        }
    }
}
```

- Output



```
<terminated> Q1 (3) [Java Application] C:\Users\reemH\
9223372037000250000
9223372043074251001
9223372049148252004
922337205522253009
9223372061296254016
9223372067370255025
9223372073444256036
9223372079518257049
9223372085592258064
9223372091666259081
```


2.3 Question 3

- MyString1 Class

```
public class MyString1
{
    // data members
    private char[] chars;

    // methods

    public MyString1(char[] chars) //constructor
    {
        this.chars = new char[chars.length];
        for (int i = 0; i < chars.length; i++)
            this.chars[i] = chars[i];
    }
    public char charAt(int index)
    {
        return chars[index];
    }
    public int length()
    {
        return chars.length;
    }
    public MyString1 substring(int begin, int end)
    {
        char[] c = new char[end - begin];
        int i = begin;

        for (int j = 0; i < end; i++, j++)
        {
            c[j] = chars[i];
        }
        return new MyString1(c);
    }
    public MyString1 toLowerCase()
    {
        char[] c = new char[chars.length];
        for (int i = 0; i < chars.length; i++)
        {
            if (chars[i] >= 'A' && chars[i] <= 'Z')
                c[i] = (char)(chars[i] + 32);
            else
                c[i] = chars[i];
        }
        return new MyString1(c);
    }
    public boolean equals(MyString1 s)
    {
        if (chars.length != s.length())
            return false;
        for (int i = 0; i < chars.length; i++)
        {
            if(chars[i] != s.charAt(i))
                return false;
        }
        return true;
    }
}
```

```
public static MyString1 valueOf(int i)
{
    int length = 0;
    int n = i;
    while (n >= 1)
    {
        n /= 10;
        length++;
    }
    char[] ch = new char[length];

    for (int j = 0, k = (int)Math.pow(10, length - 1); j < length; j++, k /= 10)
    {
        ch[j] = Character.forDigit((i / k), 10);
        i %= k;
    }

    return new MyString1(ch);
}
```

- The main function

```
public class Q3
{
    public static void main(String[] args)
    {
        char[] c1 = {'R', 'e', 'e', 'm'};
        char[] c2 = {'H', 'e', 'l', 'l', 'o'};
        char[] c3 = {'0', '0', 'P'};

        MyString1 s1 = new MyString1(c1);
        MyString1 s2 = new MyString1(c2);
        MyString1 s3 = new MyString1(c3);
        MyString1 s4 = new MyString1(c3);

        System.out.println("Char at index 2 in s1 is: " + s1.charAt(2));

        System.out.println("\n-----\n");

        System.out.println("length of s2 is: " + s2.length());

        System.out.println("\n-----\n");

        System.out.println("substring 1 to 3 of s1 is: ");
        MyString1 sub = s1.substring(1,3);
        for (int i = 0; i < sub.length(); i++)
            System.out.print(sub.charAt(i));

        System.out.println("\n-----\n");

        System.out.println("s3 in lower case is: ");
        MyString1 lower = s3.toLowerCase();
        for (int i = 0; i < lower.length(); i++)
            System.out.print(lower.charAt(i));

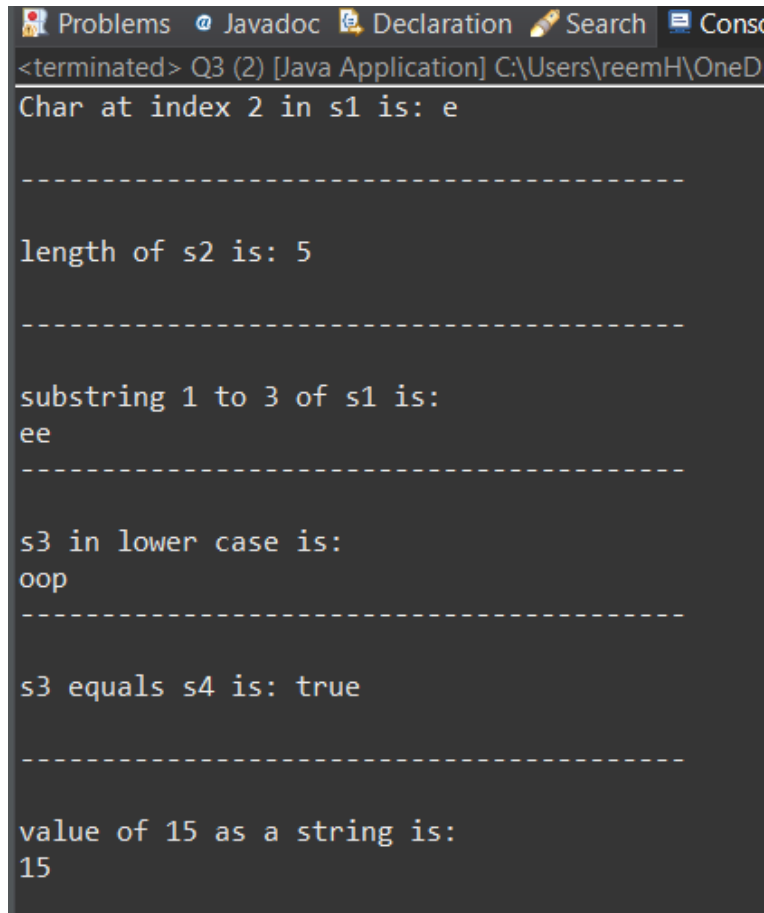
        System.out.println("\n-----\n");

        System.out.println("s3 equals s4 is: " + s3.equals(s4));

        System.out.println("\n-----\n");

        System.out.println("value of 15 as a string is: ");
        MyString1 myInt = MyString1.valueOf(15);
        for (int i = 0; i < myInt.length(); i++)
            System.out.print(myInt.charAt(i));
    }
}
```

- Output



```
Problems Javadoc Declaration Search Console
<terminated> Q3 (2) [Java Application] C:\Users\reemH\OneD
Char at index 2 in s1 is: e
-----
length of s2 is: 5
-----
substring 1 to 3 of s1 is:
ee
-----
s3 in lower case is:
oop
-----
s3 equals s4 is: true
-----
value of 15 as a string is:
15
```

3 Conclusion

This lab was very clear and helpful.