



TechM Full-Stack Software Development

Lecture On: Strings

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In Last Class, we covered....

- Queues



Homework Discussion

1. Reverse a queue

Today's Agenda

1 Strings

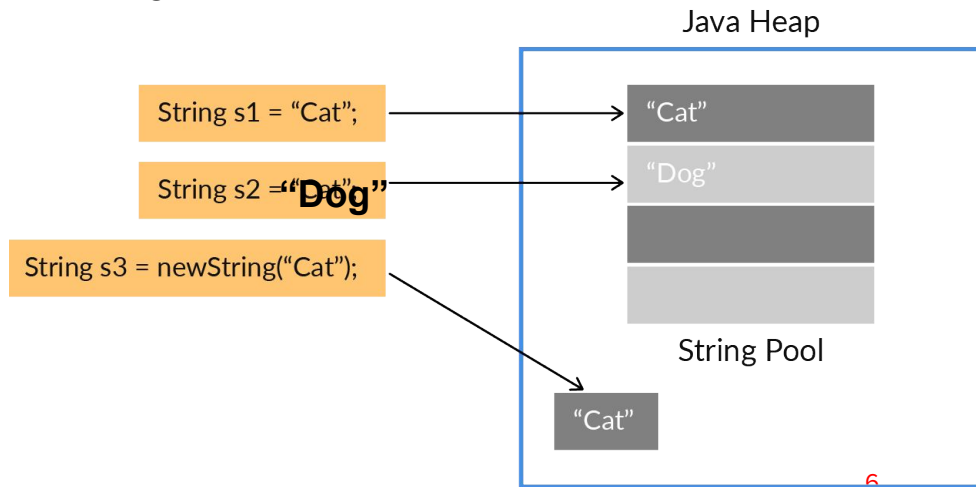


Strings

Strings are sequences of 'character' variables and are used to store text. They are immutable, which means that they can never be changed. If we change the value of a String, a new instance of the String is made and stored into the 'String Pool'.

The following two ways can be used to create Strings:

- Direct value assignment
- Using the 'new' keyword



Poll 1 (15 Sec.)

In which of the following ways can a string be created?

1. String name = "Vishwa";
2. String name = new String("Vishwa");
3. Both 1 and 2
4. Only 1

Poll 1 (Answer)

In which of the following ways can a string be created?

1. String name = "Vishwa";
2. String name = new String ("Vishwa");
- 3. Both 1 and 2**
4. Only 1

Poll 2 (15 Sec.)

How many objects are created when you write:
`String name = new String("Vishwa");`

1. 1

2. 0

3. 2

4. 3

Poll 2 (Answer)

How many objects are created when you write:
`String name = new String("Vishwa");`

1. 1

2. 0

3. 2

4. 3

Poll 3 (15 Sec.)

An object is called 'mutable' if a new object gets created every time we try to modify the existing object.

1. True
2. False

Poll 3 (Answer)

An object is called 'mutable' if a new object gets created every time we try to modify the existing object.

1. **True**

2. False

Poll 4 (15 Sec.)

Which of the following will help us make a class immutable?

1. Making fields final
2. Making the class final
3. Not exposing setter methods
4. All of the above

Poll 4 (Answer)

Which of the following will help us make a class immutable?

1. Making fields final
2. Making the class final
3. Not exposing setter methods
4. **All of the above**

Poll 5 (15 Sec.)

What do we mean when we say that a class is immutable?

1. It can't be created
2. It can't be modified
3. It can't be used
4. None of these

Poll 5 (Answer)

What do we mean when we say that a class is immutable?

1. It can't be created
2. **It can't be modified**
3. It can't be used
4. None of these

Poll 6 (15 Sec.)

'String' class is mutable.

1. True
2. False

Poll 6 (Answer)

'String' class is mutable.

1. True

2. **False**

Java String library

Some of most commonly used functions are:

- **length:** Returns the number of characters in the String.

The return type here is *int*.

Example:

```
String s1 = "upGrad";  
s1.length(); // returns 6
```

- **replace:** Returns new string by replacing all occurrences of given character.

The return type here is *String*.

Example:

```
String s1 = "upGrad";  
String s2 = s1.replace('G','g'); //s2 = "upgrad"
```

Java String library

- **concat:** Concatenate two strings
The return type here is ***String***.

Example:

```
String s1 = "upGrad";  
String s2 = "edu";  
String s3 = s1.concat(s2);  
System.out.println(s3); //prints upGradedu
```

- **indexOf:** Returns the index within the string of the first occurrence of the specified string.
The return type here is ***int***.

Example:

```
String s1 = "Learn Share Learn";  
int output = s1.indexOf("Share"); // returns 6
```

Java String library

- **charAt**: Returns the character at i^{th} index.
The return type here is ***char***.

Example:

```
String s1 = "upGrad";  
int output = s1.charAt(2); // returns G
```

Java String library

- **compareTo**: Compares two string lexicographically.

The return type here is *int*.

```
int out = s1.compareTo(s2); // s1 and s2 are strings to be compared
```

This returns the difference $s1 - s2$

if $out < 0$, $s1$ comes before $s2$.

if $out = 0$, $s1$ and $s2$ are same.

if $out > 0$, $s1$ comes after $s2$.

The value is calculated as: $(int)s1.charAt(i) - (int)s2.charAt(i)$

Example:

```
String str1 = "Hello Mumbai";
```

```
String str2 = "Hello Pune";
```

```
String str3 = "Hello Mumbai";
```

```
int out1 = str1.compareTo(str2); // -3
```

```
int out2 = str1.compareTo(str3); // 0
```

Poll 7 (15 Sec.)

Which among the following options can be used to find the length of the string (str)?

1. `str.length`
2. `str.length()`
3. `str.size()`
4. `str.getLength()`

Poll 7 (Answer)

Which among the following options can be used to find the length of the string (str)?

1. `str.length`
2. **`str.length()`**
3. `str.size()`
4. `str.getLength()`

Java String library

- **contains:** returns true if sequence of char values are found in this string otherwise returns false

Example:

```
String s1 = "easy to learn";  
  
System.out.println(s1.contains("to")); // prints true  
  
System.out.println(s1.contains("how")); // prints false
```

- **equals:** Compares this string to the specified object

Example:

```
String s1 = "hello";  
  
boolean out1 = s1.equals("hello"); // returns true  
  
boolean out2 = s1.equals("why"); // returns false
```

Java String library

- **toUpperCase:** Converts all the characters in the String to uppercase

Example:

```
String word1 = "hello";  
String word2 = word1.toUpperCase(); // returns "HELLO"
```

- **toLowerCase:** Converts all the characters in the String to lowercase

Example:

```
String word1 = "HeLLo";  
String word2 = word1.toLowerCase(); // returns "hello"
```

Java String library

- **trim:** Returns the copy of the String, by removing white spaces at both ends

Example:

```
String s1 = " upGrad ";  
String s2 = s1.trim(); // returns "upGrad"
```

- **split:** Breaks the given string around matches of the given regular expression

Example:

```
String str = "upGrad";  
String[] arr = str.split("a");  
for (String a : arr)  
    System.out.println(a); // prints "upGr" and "d"
```

Java String library

- **replaceAll**: replaces all occurrences of given string

Example:

```
String s1 = "hello";  
String s2 = s1.replaceAll("ll", "z"); // s2 = "hezo"
```

- **join**: Concatenates the given elements and returns the concatenated string

Example:

```
String s1 = String.join(" ", "easy", "to", "learn");  
System.out.println(s1); // prints " easytolearn"
```

Poll 8 (15 Sec.)

Which method of the string can be used to check equality?

1. equals()
2. equal()
3. Equals()
4. Equal()

Poll 8 (Answer)

Which method of the string can be used to check equality?

1. **equals()**
2. equal()
3. Equals()
4. Equal()

Poll 9 (15 Sec.)

Which method of the string can be used to remove white spaces at start and end?

1. `replaceAll()`
2. `trim()`
3. `split()`
4. `contains()`

Poll 9 (Answer)

Which method of the string can be used to remove white spaces at start and end?

1. `replaceAll()`
2. **`trim()`**
3. `split()`
4. `contains()`

Hands-on Coding

- Write a program to find out duplicate characters in a string.

Sample Input:

abbcddee

Sample Output:

b e

- Remove duplicate from array of String.

Sample Input:

5

a b b c d

Sample output:

a b c d

Hands-on Coding

- Reverse a String

Sample Input:

abcde

Sample Output:

edcba

- Write a program to check if a given string is a palindrome or not.

Sample Input:

abcba

Sample Output:

true

Hands-on Coding

- Check if two Strings are anagrams of each other.

Sample Input 1:

abd

abbdab

Sample Output 1:

false

(2nd string cannot be formed by rearranging characters of the first string)

Sample Input 2:

tea

eat

Sample Output 2:

true

(2nd string can be formed by rearranging characters of the first string)

Hands-on Coding

- Count the number of vowels and consonants in a String.

Sample Input:

abcde

Sample Output:

2 3

(2 vowels and 3 consonants)

Poll 10 (15 Sec.)

How many permutations of string “ABC” are possible?

1. 3
2. 9
3. 6
4. 1

Poll 10 (Answer)

How many permutations of string “ABC” are possible?

1. 3

2. 9

3. 6

4. 1

Hands-on Coding

- Count the occurrence of a given character in a string.

Sample Input:

a

abbac

Sample Output:

2

- Find all permutations of a string.

Sample Input:

ABC

Sample Output:

ABC ACB BAC BCA CBA CAB

(There are 6 possible permutations of string ABC)

Hands-on Coding

- Reverse words in a given sentence without using any library method.

Sample Input:

this is string

Sample Output:

string is this

- Check if two strings are a rotation of each other.

Sample Input:

abcd

bcda

Sample Output:

true

(possible by 1 left rotation of 1st string)

Poll 11 (15 Sec.)

Which is the first character that gets repeated in the string “malayalam”?

1. m
2. a
3. l
4. y

Poll 11 (Answer)

Which is the first character that gets repeated in the string “malayalam”?

1. m
2. a
3. l
4. y

Coding Practice

- Print first repeated character from String.

Sample Input:

triggered

Sample Output:

g

Homework

1. Remove characters from the first String which are present in the second String.

Sample Input:

education

rate

Sample Output:

duction

('e', 'a', 't' are present in 2nd string too, so remove them from 1st string)

2. Print first non repeated character from String.

Sample Input:

triggered

Sample Output:

t

Tasks to complete after the session

Homework Questions
MCQs
Coding Questions

In the next class...

- Tree data structure



Thank You!