Strings

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Rules ⟶ Q ⟶ QT
A ⟶ Private chat
Hands on keyboard.

Definition ⟶ Sequence of characters

Note ⟶ " " for string ' ' ⟶ for character.

Examples —
- "abc123 ⟶ no
- "@bc" ⟶ yes
- "123" ⟶ yes
- "abc@123" ⟶ yes
- '123' ⟶ no

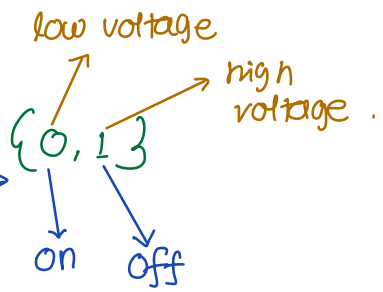
Difference b/w "123" (string) & 123 (int)

Operations that can be performed on a string
- ⟶ Concatenation
- ⟶ Find length

Operations that can be performed on integers
- ⟶ All mathematical operations

Strings in Computers

Computer understands binary



What is binary ?

int a = 10 ; ⟶ $(1010)_2$ converted to binary

Does the computer only need to store numerical data?

NO we will also store char, string .....

we should somehow be able to map characters to some numerical value, so that a computer can understand

ASCII {American Standard Code for Information Interchange}

char	ASCII
'A'	65

char	ASCII
'a'	97

char	ASCII
'0'	48

Consider the String s = "India"

['I', 'n', 'd', 'i', 'a']
 0 1 2 3 4

length ⟶ s.length();

Accessing character at the i^{th} index ⟶ s.charAt(i);

Check equality ⟶ Given s and t as String

s.equals(t)

NOTE: Always compare non-primitive data types with .equals()

Q> Given a string, print its characters in new line.

Input ⟶ "Shaik"

Output ⟶ S
h
a
i
k

```java
public class Main {
    public static void main(String[] args) {
        String s = "Shaik";
        for (int i = 0; i < s.length(); i++) {
            char ch = s.charAt(i);
            System.out.println(ch);
        }
    }
}
```

Q> Given a string, print the ascii of its characters in new line.

Input ⟶ "India"

output ⟶ 73 'I'
110 'n'
100 'd'
105 'i'
97 'a'

```java
public class Main {
    public static void main(String[] args) {
        String s = "India";
        for (int i = 0; i < s.length(); i++) {
            int ascii = s.charAt(i);
            System.out.println(ascii);
        }
    }
}
```

Q> Given a string print the count of uppercase characters.

Input ⟶ "kjRS78q31@3 Q"

output ⟶ 3

If a character is uppercase it will be in range of

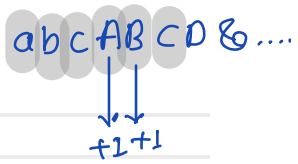
['A' —— 'Z']

↓ 65 ↓ 90

```java
public class Main {
  public static void main(String[] args) {
    String s = "abcABCD&*^!@#";
    int A = 'A'; // 65
    int Z = 'Z'; // 90
    int cnt = 0;
    for(int i = 0; i < s.length(); i++){
      int ascii = s.charAt(i);

      // character is within the range of 'A' to 'Z'
      if(A <= ascii && ascii <= Z){
        cnt++;
      }
    }

    System.out.println(cnt);
  }
}
```



```java
public class Main {
  public static void main(String[] args) {
      String s = "abcABCD&*^!@#";
      int cnt = 0;
      for(int i = 0; i < s.length(); i++){
        char ch = s.charAt(i);

        // character is within the range of 'A' to 'Z'
        if('A' <= ch && ch <= 'Z'){
          cnt++;
        }
      }

      System.out.println(cnt);
  }
}
```

Q) Given a string print the count of special characters.

Input ⟶ "kjRS78q31@3 Q"

output ⟶ 2

What is a special character ?

any letter ⟶ X

any number ⟶ X

} anything other than this

character should not be a lowercase alphabet

" " uppercase alphabet

" " digit {0-9}

character should not be lower case alphabet or upper case alphabet or digit

```java
public class Main {
  public static void main(String[] args) {
      String s = "kjRS78q31@3 Q{}";
      int cnt = 0;
      for(int i = 0; i < s.length(); i++){
        char ch = s.charAt(i);
        if(
          'A' <= ch && ch <= 'Z' ||
          'a' <= ch && ch <= 'z' ||
          '0' <= ch && ch <= '9'
          ){
          continue;
        }
        cnt++;
      }
      System.out.println(cnt);
  }
}
```

{ if ch is letter or digit } continue;

Break

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Q> Given a string. Return the reverse of a string

Input ⟶ "Rishav"

Output ⟶ "vahsiR"

Hint ⟶ Try to think of concatenation

s = "a b c"

r = "c b a"

	r
r = "" ; ⟶	""
r = r + "c" ⟶	"c"
r = r + "b" ⟶	"cb"
r = r + "a" ⟶	"cba"

Idea ⟶ Traverse from last char to first char

keep concatenating the character to any var.

```java
public class Main {
    public static void main(String[] args) {
        String s = "India";
        System.out.println(reverseString(s));
    }

    static String reverseString(String s) {
        String reverse = "";
        for (int i = s.length() - 1; i >= 0; i--) {
            char ch = s.charAt(i);
            reverse += ch;
        }
        return reverse;
    }
}
```

Q> Given a string, check whether its palindrome or not.

Palindrome reads the same from left to right and right to left

```
S = "iti"   ⟶  true
S = "maam"  ⟶  true
S = "abc"   ⟶  "abc" != "cba"
                false
```

Hint ⟶ see if you can re-use prev questions code.

```
static boolean isPalindrome(String s){
    String r = reverseString(s);
    if(s.equals(r)){
        return true;
    }
    else{
        return false;
    }
}
```

return s.equals(r);

Announcement ⟶ Practice Test

15th June 00:00 16th June 23:59