25/02/2023

Character Arrays

int aur [10]; By this statement, in memory 10 blocks of size = 4 bytes each will be allocated. Integers are stored here.

char ch [10]; By this statement g in memory 10 blocks of size = I byte each will be allocated. Each block will contain a character

Signed char range -> -128 to 127 Unsigned char range -> 0 to 255

Char are [10] j

data type av is a data structure 4 not data type.

Vint au [10]

If we want to take input for 3rd element, then we do cin >> arr [2] j

charch [10]

In this we can take input as single character or as sequence

cin>> ch [2] i // Single character input cin>> ch j // As a sequence

Also we take input via for loop also just like

înteger arrays.
char name [100]; cin >> name; Whenever we take input like this, by default there will be a null character at the end & it represents the termination
name - Babbar Babbar Phull character Babbar Babbar Phull character Babbar Babbar Babbar Babbar Phull character Babbar Babbar Phull character Babbar Phu
Integer value of null character i.e the ASCII code of null character is 0.
char name [100]; Space complexity = O(1) char name [10];
char name [100]; cin>> name; → Bhavya Bhalla cout << name; → Bhavya
cin does not read spaces or tabs 4 here only Bhavya is printed. But how can we print Bhavya Bhalla i.e how can we detect spaces.
Reading spaces Rather than using cin we use getline

function.
prame of averay
cin-getline (avr. 100);
maximum length of input
We can also set our own delimiter. By defaul
the delimiter is space.
Problem Solving
I Find the length of string.
i/b → Bhavya
1/b → Bhavya 0/b → 6
We just have to simply traverse linearly
until we get the null character & as we pass each character, len is incremented
we pass each character, len is incremented
Code
int getlength (char name []) {
int len = 0; $ int l' = 0;$
While (name [i]] = °(0°) {
len++i
l'++j
3
return len;
Inbuilt functions for string
Inbuilt functions for string. 1) strlen (name) i - To find length of the string.

2) Stromb // For comparasion

But we don't have to dependent on the inbuilt functions.

Q2 Reverse the string

i/þ→ aba 0/þ→ aba

Algorithm

Babar 0 1 2 3 4 5

S = 0 e = 5

swap (name [s], name [e]); s++, e--

уаbbaB 0 1 2 3 4 5

2) 5 = 1

swap (name [S], name [e]) j

8 a b b a B 0 1 2 3 4 5

 $\begin{vmatrix} 3 & -2 \\ e & 3 \end{vmatrix}$

Swap (name[S], name[e]); S++, e-- v a b b a В,

now s > e , hence exit the loop as we abready have reversed the string.

reverse String (char name []) {

int s = 0int e = getLength (name) - 1 j

While (S < = e) {

swab (name [S], name [e]) j

S++i

ر - - ز

Time complexity: 0(n)

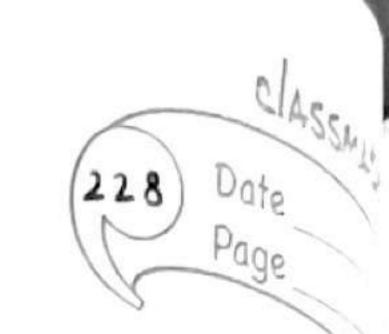
Space complexity: 0(1)

Mote - Array is passed as reference to function whereas a copy of vector is created.

Q3 Replace all spaces in the string

1/b-> My name is Babbar 0/b-> My @name@is @Babbar

Just we have to use a single if condition & we are at space then make it @.



void replaces paces (char name [], intlen

for (int i=0; i< len; l++) {
 if (name[i]==' ') {
 name[i]= '@';

3

3

Time complexity: 0(n) Space complexity: 0(1)

Palindrome of string
Palindrome means same if we read
from left to right or right to left.

i/p -> racecor 0/p -> True

Algorithm - I -> Takes extra space of O(n).

Make new string & store reverse stringin it.

Compare reverse string & i/p string & if equal then palindrome, else not a palindrome.

Algorithm-2 Using 2 pointer approach

race caga

1) S = 0e = 6

$$|S = 1 | 9 | = 5$$

$$4) S = 3 , e = 3$$

int
$$s = 0$$

while
$$(S < = e)$$
 {

$$S++$$
 \dot{S}

<= cz) { _

Q5 Convert string to uppercase

i/b -> bhavya 0/b -> BHAVYA

To convert any lowercase character to the uppercase character, we need to subtract 'a' & add 'A' to the character

ch = ch - ea 2 + eA 2 ;

Code

Void convert String To Upper (char name!)

int n = strlen (name);

for (int i=0 ; i< n; i++) {

if (name [i] > = 'a' & & name [i]

name [i] = name [i] - ea + eA);

Strings

Sequence of characters. String is a data type whereas character array is a data structure.

There is very minute difference blue strings & character avoing. Null character is also present in strings. We will be using strings only in the future. Rarely we will be using character arrays. String stri cin>>stri // Taking input in string getline (cing str); // To read spaces also. Note - We can not access null character in case of strings, however we don't have any access issue in case of character arrays. Inbuilt functions of strings Str -> Bhavya 1) Str. length () i -> 6. Tells length of string 2) strempty () j -> 0. 0 as string is not empty

I if string is empty 3) Str. bush - back ('s') j -> Bhavyas 4) str. pop-back () i - Bhavya. Removes last character 5) str. substr (0,6) j +Bhavya

1 Hength of substring oth index star Substr function is very important 4 we might forget this. SI. compare (S2) → O Equal strings

1 51 > 52

- I S2

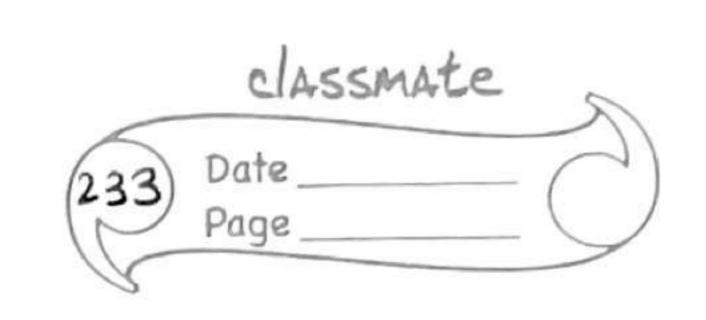
HODE PETSIN

However we use compare function to know whether the strings are equal or not. Implement compare function bool compare String (string a, string b){ if (a.length () ! = b.length ())
retwin false; elsed for (int i = 0 ; i < a · length () ; i++){
 if (a[i] [= b[i]) { return false return true Find function String sentence = "hello all"; String target = "hello"; sentence find (target); → 0

sentence find ("all"); → 6

sentence find ("hi"); → Some random Value or

std: string:: npos - To access npos.
4 no position



- 8) replace
 - String str = "This is my first message"; string word = "Babbar";
 - Thow many characters to remove str. replace (0, 4, word);

 2 start 4 what to put there?
 - 0/b- Babbar is my first message
- erase
 - String Str = "ABCDEFAHIJKLMNOPQRST"; str. erase (0,4); delete 4 characters 2 start from 0
 - EFGHIJKLMNOPQRST -> 0/p of above