Date ....

& Vector: - vector are same as dynamic array with theboo ability to resize itself automatica -lly when an element is inserted or deleted. - Ily when an element is inserted or deleted. vector elements are placed in contigous storage so that they can be accessed & traversed using iterators. In vertors, data is inserted at the Inserting at the end takes different -iable time, as sometimes the array may need to be extended. Data is removed only from the end, & removing the last element takes only constant time because no resizing nappens. Storage is managed automatically so that on an attempt to insert an element into a full vector, a larger memory block is allocated 0000 for the vector, the vector elements are copied to the new block, 4 the old block is released

vector(int) arr; vector Keyword Datatype

Date	
* vector initialization:	*
	Walls Mark
#include (rostream)	
#include (vector)	
using namespace std;	
int main()	
5 CONTRACTORY	
vector (int) agramphon	
cout ( arrisize () ( end);	
(cout << arr. capacity();	
Morretynoogla parting mill	
3 Maria de la	
· love dond dong it call	
I size function capacity func	ti
return the noon return to	
of elements available	
that are space for	
currently present elements in	
in vector vector	
size 2 4	133
votos, 10 2 3 4 9 0 10 19 1	F
	-

capacity 28

\* Insertion & Deletion to a vector: Hinclude (iostream) Hinclude (vector) using namespace std; int main () { 11 declare vector vector (int) arr; llinserting element in vector arr. push\_back (30); arr. push-back (40); arr. push-back (45); Marr. push back (59); 11 print vector forlint is o; it arr. size(); (++ivection cout << arrafied << Il removing element from vector · arr. pop-back (): arr. pop-back (): liprint vector for (inti: 0; i < arr, Size (); Spiral 3 COUT ( arr [i] << " "

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0	& Explicitly allocate size to a vertor:													
<u></u>	vector (int) arr (10);													
9	cout << arr. size();													
5	cout « arr capacity ();													
5	(110MM) and													
9	Example:-													
	if we intially declare the													
9	size of vector, then all the													
>	values in the vector is													
9	by default 0.													
9_	ALVITED DE LA CONTRACTOR DE LA CONTRACTO													
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Ques Find unique element.

welve given an avvay of integers
of size n, the task is to find the
first non-repeating element in
the avvay.

Example:

£-1, 2, -1, 3, 03

the first number that does not repeat in the whole array is 2.

Approach: By using XOR operator. XOR returns 0 when both eleme -nts are same 4 returns 1 when elements are different.

a	b	C= a^b	T
0	0	0	
0			
1	0	1	1
1	1	0	

Example: - If we do XOR operation on elements in the array. 5 £1,2,4,2,1,3,6,5,5,6,43 200 21220 9 Like this, if we do xOR operation on all the elements in the array, S then we find the answer. S 5 x^2^x^2x^2x^3^6^55^5 3 is the output. code :-#include (iost ream > 10000) #include (vector) using namespace std; TURNI ONIDAN void find unique (vector (int) arr) llans variable & initialize it with o to perform XOR operation int ans : 0; Teacher's Sian .....

11 perform XOR operation of ans variable & array elements for (int i.o.; i < arr. size (); ans 2 ans arr [i]; cout << "in unique element in given array is " << ans int main() and books and works 11taking size of vector int n; cout << "Enter the size of the vector: "; cin >> n: Ildeclaring the vector of n size vector (int) arr (n); 11 taking input cout << "In enter elements: "; for (int i20; i ( arr. size(); itt) H ESTIDITION & STUDIOU TADY cin >> arrli]; find Unique (arr);

£1,3,5,7,9,2,4,6,83 Approach: we've given two array & we have to do union of these array). Firsty, we create a new vector S & copy the elements of both array in vector then print the vector. 5 code!int main () [ array ] int arrit] 2 &1, 3, 5, 7, 93. int n1 25; 11array 2 int arr2[] 2 £ 2, 4, 6, 8 3; int n2 2 4; vector (int) ans;

11 copying arri elements to ans
for (inti: 0; i < n1; itt)

ans. push\_back(arricis);

11 copying arrz elements to ans for (inti 20; i < n2; itt)

ans. push-back (arr2[i]);

Il printing ans vector
for (int i , o , i < ans. size(); 1+1)

cout << ans [i] << ";

return o;

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Ques Intersection of two arrays.

£1,2,3,4,6,83 N £3,4,9,103

Approach: we check early of arrivation each e arrivation each e then we insert the ans vector (using rathernoans the end, print the code:-Approach: we check each element of arri with each element of arrz , & it both elements are maching then we insert the element in ans vector (using nested 100ps) At the end, print the ans vector

#include (iostream) # include (vector) using namespace std: int main () rolland over and

int arrill : £1, 2, 3, 4, 6, 83. int n1 26: int arr2[] = £3, 4, 9, 103;

vector (int) ans;

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for (int i: 0; ix n1; itt) forlint j 20; j < 'n2; j++) if (arrici) 22 arr2[j]) ans. push-back (arrilli); cout << "Intersection are:"; for (intizo; icans. size(); itt cout << ans [i] << " return O; If there are duplicate elements in any array then also interjection will show duplicate elements. To avoid this, we mark the element. by any random value so that it will not compare at next itera -tion

forlinti:0; i < nl; i++) forlintj: 0; j < n2; j+t) if(arrl[i] 22 avr2[j]) arr2[j] 2 INT\_MIN; ans push-back (arriti); run south a to toward 919 3 while () perzyce > 1 you in hor) HAVE DIVISOME TOT GOOD YSNINI It to they with ving triangle is a stranger of the stranger

Date ..... Ques Pair sum. #include (iostream) #include (vector) using namespace std; int main () vector (int) arr 210, 20, 30, 403; int sum = 60; llouter loop for picking up 1 element at a time. for (int i= 0; i < arr. size (); itt) llinner loop for making first element pair with rest of the right side elements. for lint je itl; j < arr. size(); if (arr [i] + arr [j] 22 sum cout << "Pair: (" << arr[i] = << ", " << arr[j] << ")" << = " makes" << sym; & logic to find & print every pair in an array. int R = 1;
for(int i : 0; i < arr. size(); itt)
{ forlint j= i+1; j < arr. size(); j++) cout << "Pair" << k << ":(" << arr[j] << ")";

Rtt: if we have to find & print every pair in rois above using 2 100ps For finding Triplet, we

Date..... Ques Triplet sum. #include (iostream) Hinclude (vector) using namespace std; int main () ¿ vector (int) arr & 10 20, 30, 403; int sum 260; forlint i 20; i (arr. size(); itt) for (int jait); j ( arr. size (); forlint R=j+1; R<arr. size(); Rtt if (arr[i] + arr[j] + arr[R] 22 Sym) cout << "Pair: ( << arr[i] << arr[j] <<
arr[k] << ")" <<
"makes" << sum; return 0:

Date.....

Ques Find four numbers that is equal to the sum. to uption on riguin origin # include (iostream) #include (vector) - 4701 An 10 11) using namespace std; stir topic int main() 11 9W 919H & NIDOYOOA vector (int) arr £10,20,30,40,503; int sum 2100; for (int 120; i < arr. size(); itt) { for (int ja 1+1; jkarr, size(); j++) { for (int k=jt1; k < arr, size(); ktt) for (int 12 Rt1; 1 < arr, size (); 1+t dividi if (arr[i] + arr[j] + arr[k] + arrElJ 22 sum) dod trotz LIJAAD SOUNTEIJK QVVEIJK QVVEIJ MNO MOCK ATTERIX ATTELIZED return O in and the

Ques isort o's & l'sin apot bring

we've given an array of o's and i's & we have to sort them, means, all o's at left side & all i's at i sight side.

Approach: Here we use "Two Pointer"
Approach.

"start" variable will point on oth

"end" variable will point on n-1 index

"i" variable will also point on oth index.

If arr[i] is 0, then swap it with arr[start] and increment is start both.

If arr[i] is I, then swap it with arr[end] and decrement only end, i will not incremented because after swapping with arr[end], arr[i] got a new value & we have to process that value again.
This loop will run until i < 2 end.
when i 22 end ", loop will terminate."

```
Date.....
code :-
 Hinclude (iostream)
 # include (vector)
 using namespace std;
 int main (
   vector (int > arr & 1, 0, 1, 1, 0, 0, 1, 03;
   int start = 0;
   int end = arr. size()-1;
    int 1 2 0:
    while (i < 2 end) {
      if (arr[i] == 0)
         swap(arr[i], arr[start]);
        startt:
      if (arr[i] == 1)
        swap (arrsij, arrsend).
         end -- ;
   forlint a 20; a (arr. size(); att)
     cout << arr[a] << ";
```

return o.