NOI 2020 C++ Basics Course Content

Note 6

Vectors

The arrays were good to keep related data. But the size of the array had to be known at the time of creation. But sometimes it is necessary to create dynamically sized arrays. The solution is vectors. Vectors resize according to the number of elements it holds. In vectors new values are added at the end.

Note : To use vectors you have to import the vector library first

Vector declaration

Syntax

vector < <data type> > <variable name>;

Eg:

```
#include <vector> //importing the vector library
using namespace std;

int main() {
  //This creates a vector that can store integers
  vector <int> myVector;
  return 0;
}
```

Some important functions to work with vectors

For the examples in the following table the following vector is used

vector <int> vec;

Function	example	Description
push_back()	vec.push_back(10)	Adds the given value at the back of the vector
size()	vec.size()	Returns the size of the vector.
pop_back()	vec.pop_back()	Removes the value at the back and returns that removed value.
clear()	vec.clear()	Removes all elements from the vector.
	var[i]	Returns the element at the position i. (same way an array is accessed)
at(position)	vec.at(3)	Returns the value at the position 3
empty()	vec.empty()	Returns whether the vector is empty (a boolean value)

Extra resources:

- Vectors
  Video:
  - https://www.youtube.com/watch?v=YErKhAYBj2A
  - https://www.youtube.com/watch?v=Fm9otubOsqQ
  - https://www.youtube.com/watch?v=SGyutdso6_c&t=528s

  Reading:
  - https://www.geeksforgeeks.org/vector-in-cpp-stl/
  - http://www.cplusplus.com/reference/vector/vector/
  - https://www.tutorialspoint.com/cpp_standard_library/vector.htm