Priority Queue

code academy

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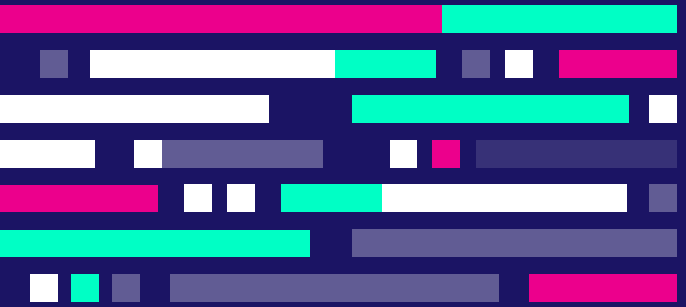
INTRODUCTION

Mainly this type data structure is as same as Queue and Stack. This type of data structures are one dimension. And in the Priority Queue we will have priority variable. In another word in this type of data structures the element which is adding collection will have priority level and it placed in the first place

01

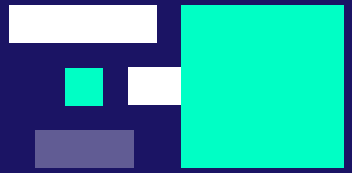
Stack



ABOUT Stack

Stack is one of the main data structures in the programming. Stack must have type and all elements have to be same type . Stack is working with LIFO logic. It means Last in first out. C# have generic Stack and non generic Stack collection classes. Let's stack functions and how it is working .

Main Methods of Stack

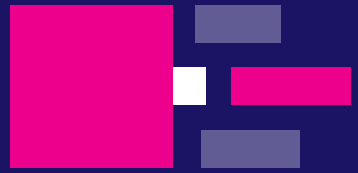


Push (T)

Insert variable front of Stack

Pop()

Return the first element and remove it

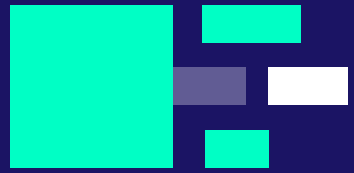


Peek (T)

Return the first element

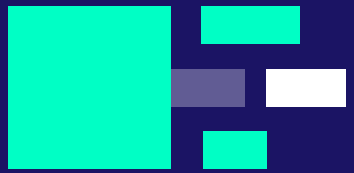
Contains(T)

Finds element in Stack.



Clear(T)

Delete all elements of stack



Let’s use stack methods

Apple

Banana

Peach

Strawberries

Oranges

Push(“Apple”)

Let’s use stack methods

Banana

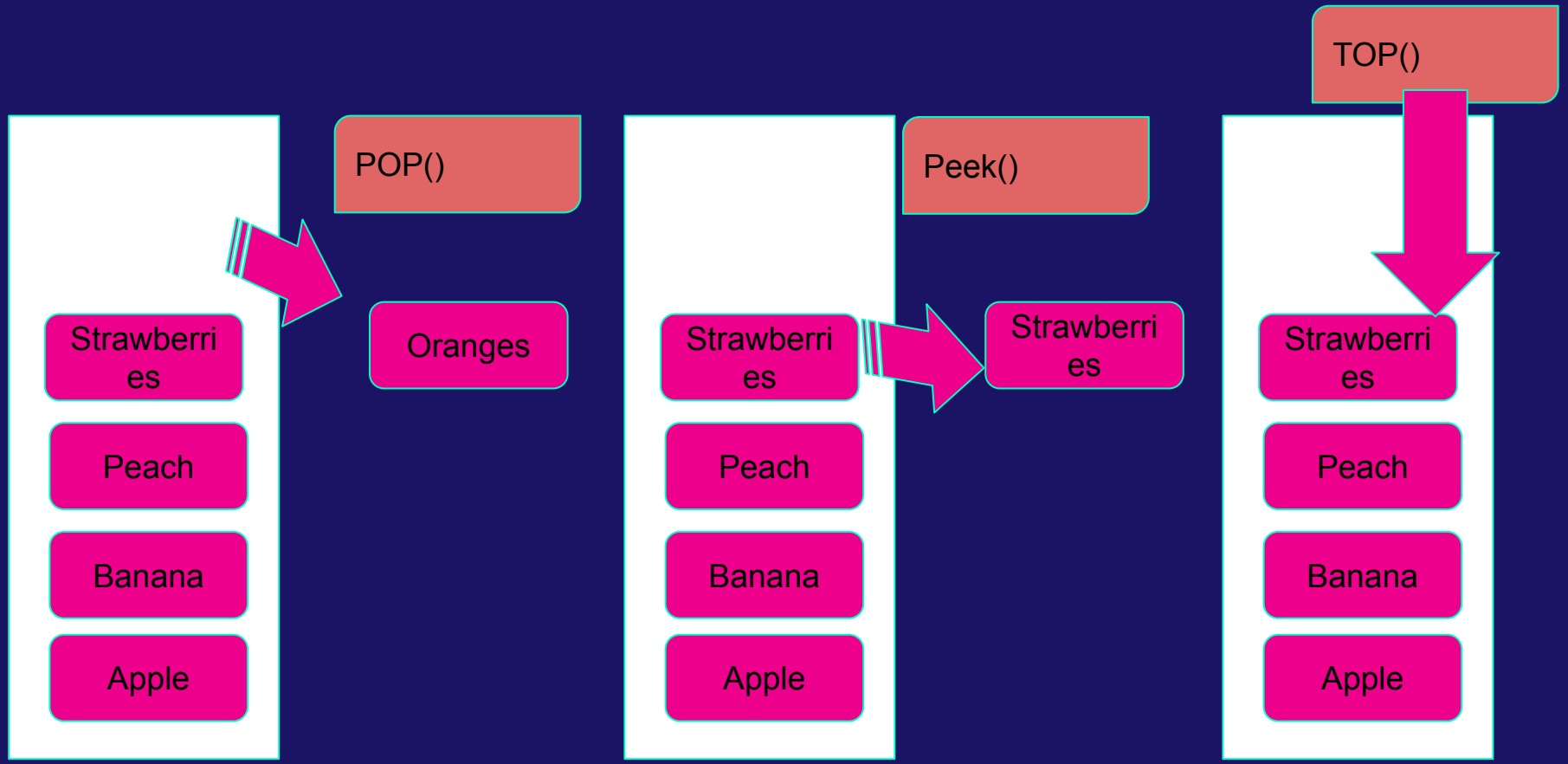
Peach

Strawberries

Oranges

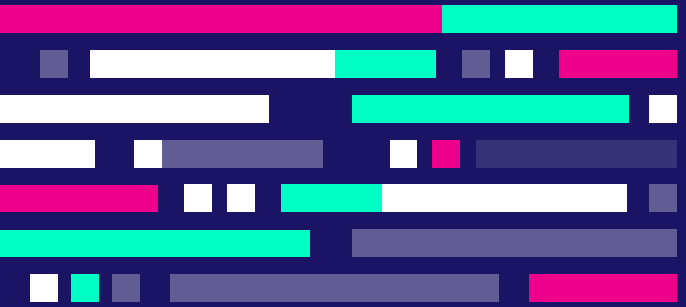
Push(“Banana”)
Push(“Peach”)
Push(“Strawberries”)
Push(“Oranges”)

Let's use stack methods



02

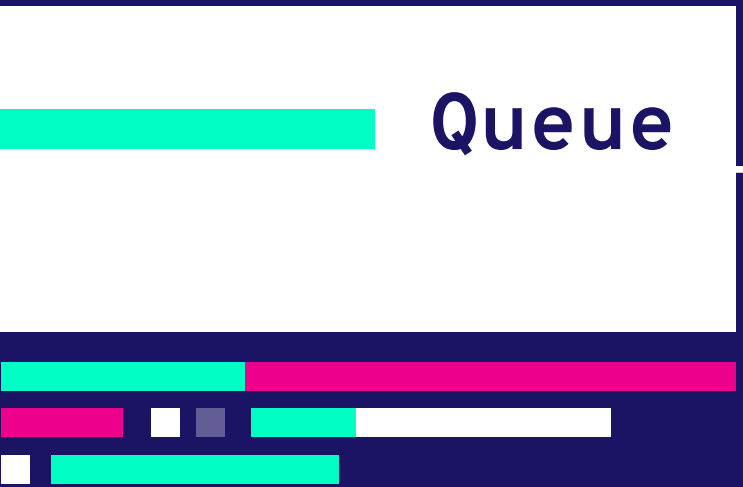
Queue



ABOUT Queue

We have already take a look stack and common methods of stack. Now we will learn “Queue”. Queue also most common data structure in programming. It is the opposite of Stack. It is FIFO style. First in First out .

Specs of Queue

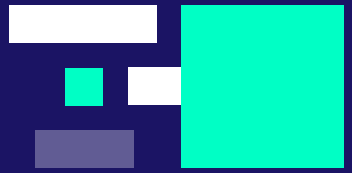


Queue is a FIFO (First In First Out) collection.

It comes under the System.Collection.Generic namespace.

The queue can contain items of the specified type. It provides compile-time type checking and does not perform boxing-out of the box because it is generic.

Main Methods of Queue



Enqueue(T)

Insert variable front of Stack

Dequeue()

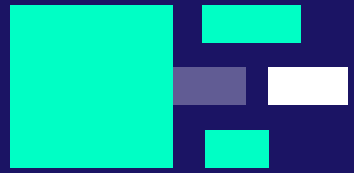
Return the first element and remove it

Peek (T)

Return the first element

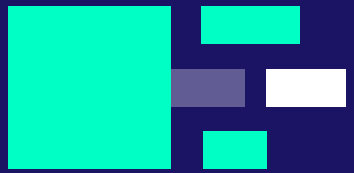
Contains(T)

Finds element in Stack.

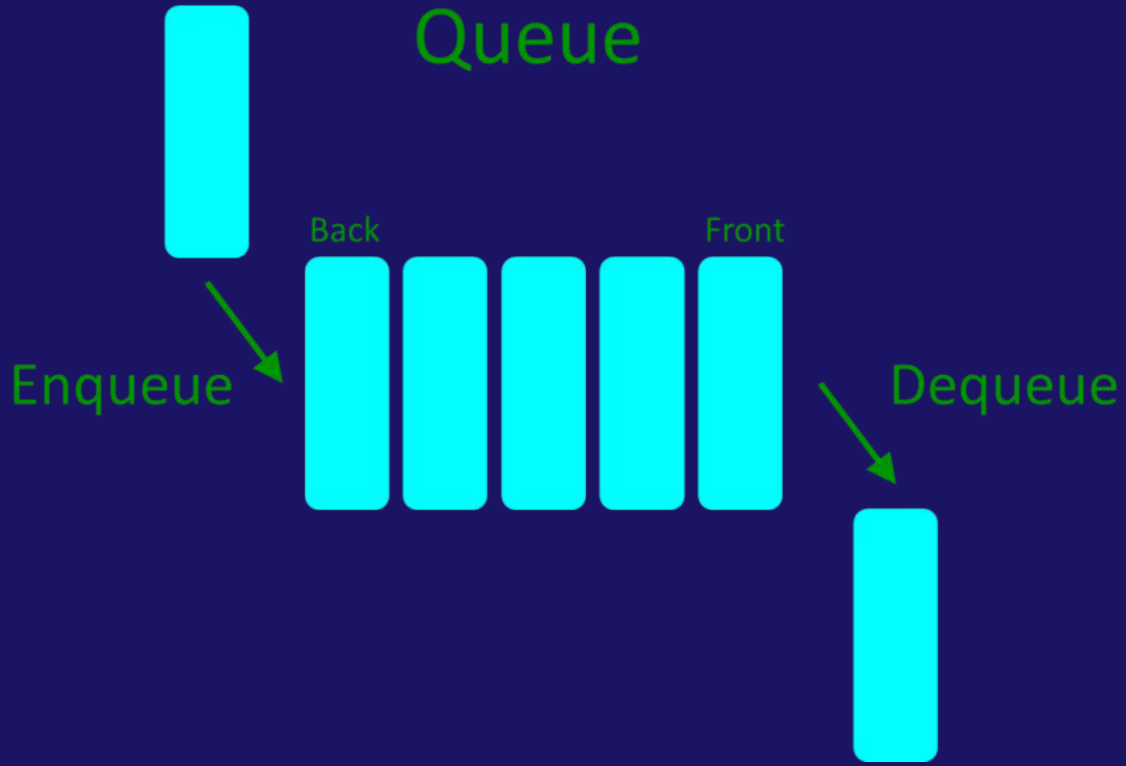


Clear(T)

Delete all elements of stack



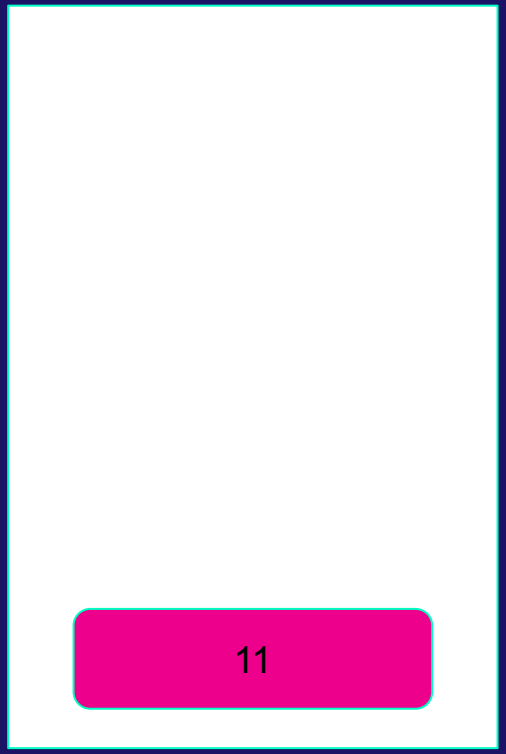
Let's use queue methods



Let’s use stack methods

Push(“11”)

Let’s use stack methods



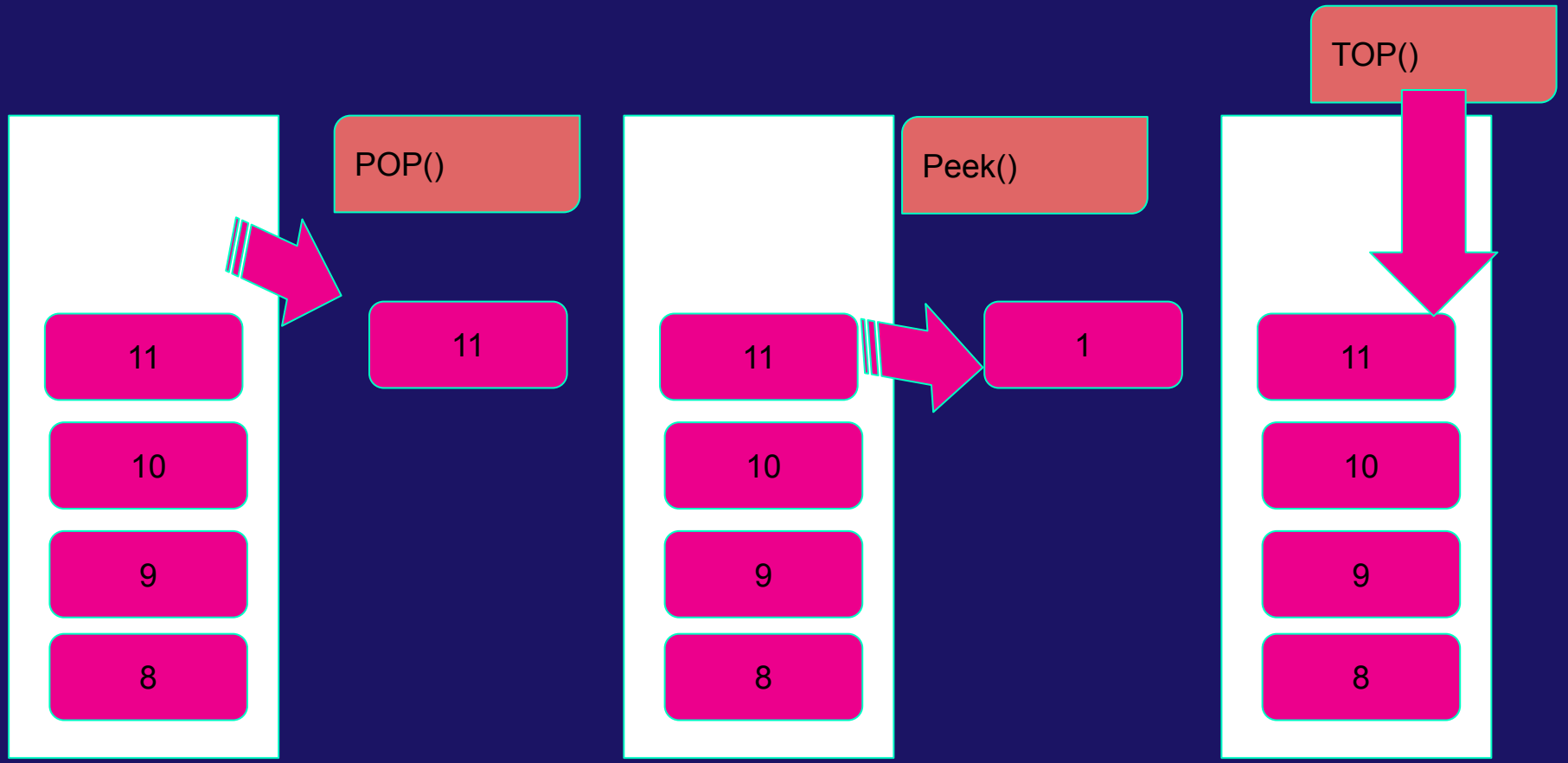
10

9

8

Push(“10”)
Push(“9”)
Push(“8”)

Let’s use stack methods



03

Priority Queue

ABOUT Priority Queues

We have already take a look stack and queue. Now we can look Priority Queue. It is as similar as Stack and Queue also it has priority level. It comes with .Net 6 . This data structure come from generic namespace als.

Why ?

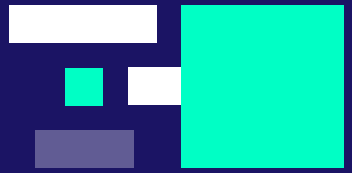
Up to present inside of .Net have types which are works FIFO (Queue<T>) and LIFO (Stack<T>) logic. Unlike this types PriorityQueue<TElement,TPriority> give opportunity to sort the items according another priority , different from arrival time. Using this type , we can set up “producer-consumer” structures with special priority logic

Specs of Queue

Priority Queue

- It takes two different generic parameter
- One of them is type of items and other is priority level type
- Priority queue uses quaternary min heap in internal implementation

Main Methods of Queue



Enqueue(T)

Insert variable front of Stack

Dequeue()

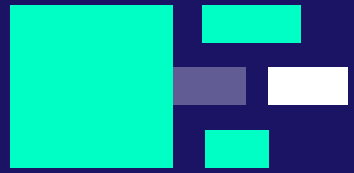
Return the first element and remove it

Peek (T)

Return the first element

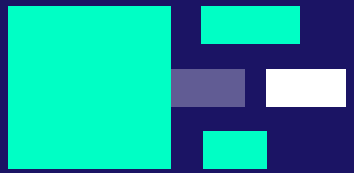
Contains(T)

Finds element in Stack.



Clear(T)

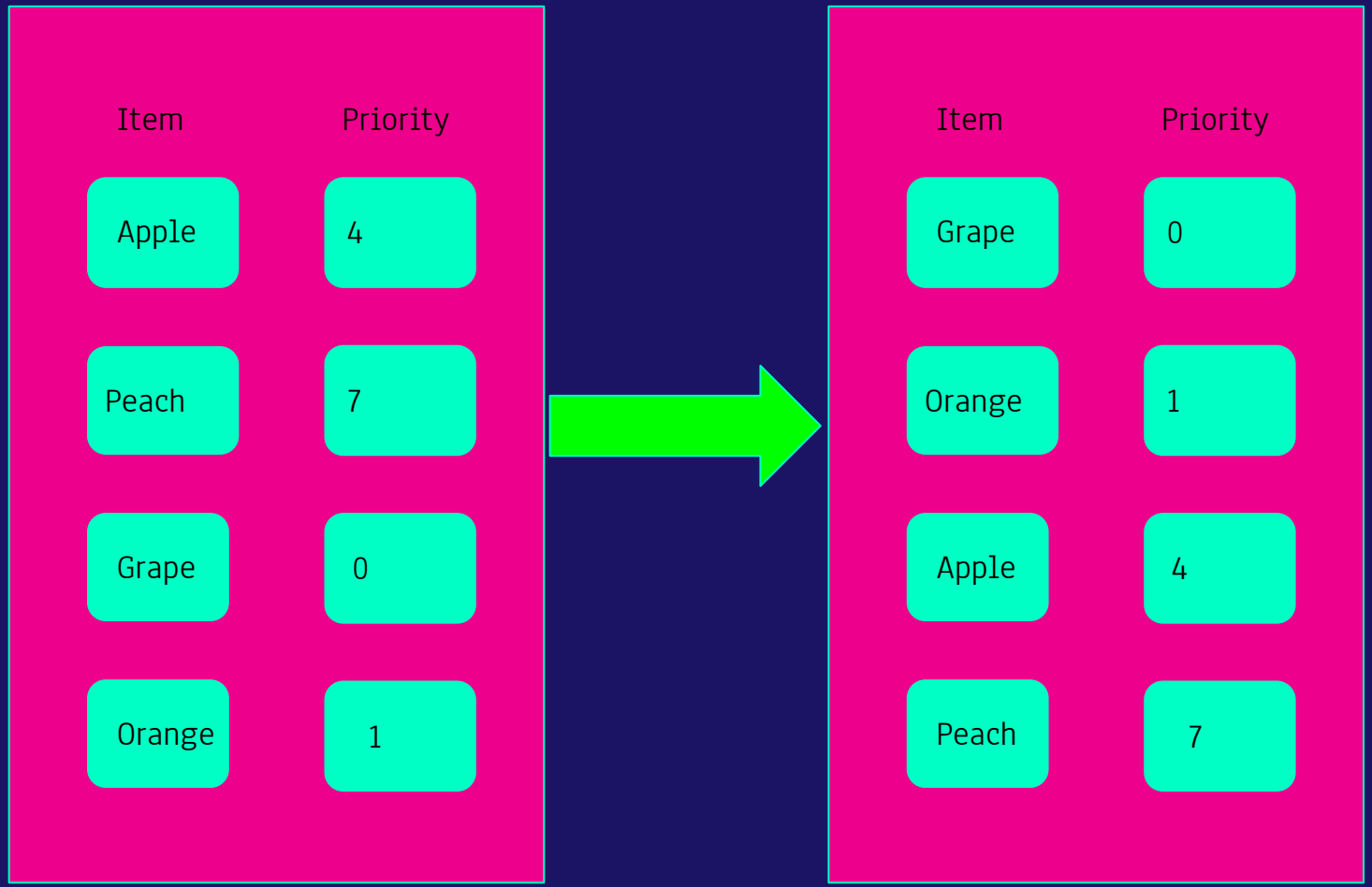
Delete all elements of stack



```
//Creatubg Priority Queue

PriorityQueue<string, int> priorityQueue = new PriorityQueue<string, int>();


//Adding Items to Queue
priorityQueue.Enqueue("Apple", 4);
priorityQueue.Enqueue("Banana", 3);
priorityQueue.Enqueue("Orange", 1);
priorityQueue.Enqueue("Strawberry", 5);
priorityQueue.Enqueue("Grape", 0);
priorityQueue.Enqueue("Pineapple", 6);
priorityQueue.Enqueue("Peach",7);
```


Item
Priority
Apple
4
Peach
7
Grape
0
Orange
1
Item
Priority
Grape
0
Orange
1
Apple
4
Peach
7

Microsoft Visual Studio Debug Console

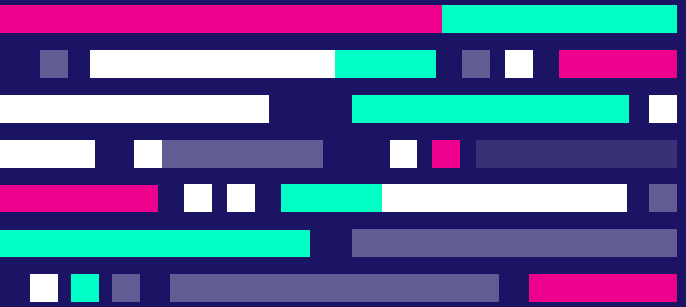
```
Fruit Name : Grape Priority : 0
Fruit Name : Orange Priority : 1
Fruit Name : Banana Priority : 3
Fruit Name : Apple Priority : 4
Fruit Name : Strawberry Priority : 5
Fruit Name : Pineapple Priority : 6
Fruit Name : Peach Priority : 7
------------------------ After using Dequeu  -----------------------------
Priority Queue size = 0

C:\Users\yusif\source\repos\PriorityQueue\PriorityQueue\bin\Debug\net6.0\PriorityQueue.exe (process 45880) exited with c
ode 0.
Press any key to close this window . . .
```

PriorityQueue<TElement,TPriority>.UnorderedItemsCollection Class

HashSet<T>

About content



Enumerates the contents of a PriorityQueue<TElement,TPriority>, without any ordering guarantees

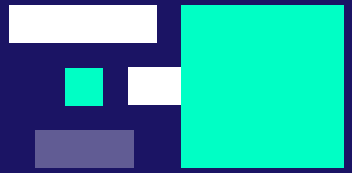
Specs of Queue

TElement

Tpriority

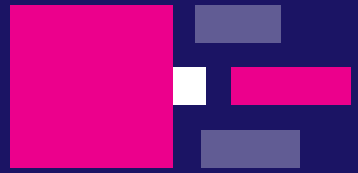
Inherit from PriorityQueue<TElement,TPriority>.UnorderedItemsCollection

Main Methods of HashSet



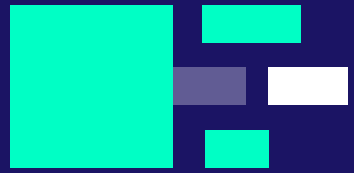
Equals(Object)

GetType()



GetEnumerator()

GetHashCode()



THANKS !

Do you have any questions?

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