**Python heap queue algorithm [29 exercises with solution ]**

[*An editor is available at the bottom of the page to write and execute the scripts.*]

Heaps are binary trees for which every parent node has a value less than or equal to any of its children.  
Here are some exercises of heap queue algorithm.

**1.** Write a Python program to find the three largest integers from a given list of numbers using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-1.php)

**2.** Write a Python program to find the three smallest integers from a given list of numbers using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-2.php)

**3.** Write a Python program to implement a heapsort by pushing all values onto a heap and then popping off the smallest values one at a time. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-3.php)

**4.** Write a Python function which accepts an arbitrary list and converts it to a heap using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-4.php)

**5.** Write a Python program to delete the smallest element from the given Heap and then inserts a new item. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-5.php)

**6.** Write a Python program to sort a given list of elements in ascending order using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-6.php)

**7.** Write a Python program to find the kth (1 <= k <= array's length) largest element in an unsorted array using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-7.php)

**8.** Write a Python program to compute maximum product of three numbers of a given array of integers using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-8.php)

**9.** Write a Python program to find the top k integers that occur the most frequently from a given lists of sorted and distinct integers using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-9.php)

**10.** Write a Python program to get the n expensive and cheap price items from a given dataset using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-10.php)

**11.** Write a Python program to merge multiple sorted inputs into a single sorted iterator (over the sorted values) using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-11.php)

**12.** Given a n x n matrix where each of the rows and columns are sorted in ascending order, write a Python program to find the kth smallest element in the matrix. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-12.php)

**13.** Write a Python program to find the nth super ugly number from a given prime list of size k using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-13.php)

**14.** Write a Python program to get the k most frequent elements from a given non-empty list of words using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-14.php)

**15.** Write a Python program to check if the letters of a given string can be rearranged so that two characters that are adjacent to each other are different using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-15.php)

**16.** Write a Python program which add integer numbers from the data stream to a heapq and compute the median of all elements. Use Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-16.php)

**17.** You are given two integer arrays sorted in ascending order and an integer k. Write a Python program to find k number of pairs (u, v) which consists of one element from the first array and one element from the second array using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-17.php)

**18.** Write a Python program to find the nth ugly number using Heap queue algorithm. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-18.php)

**19.** Write a Python program to print a heap as a tree-like data structure. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-19.php)

**20.** Write a Python program to combine two given sorted lists using heapq module. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
Original sorted lists:  
[1, 3, 5, 7, 9, 11]  
[0, 2, 4, 6, 8, 10]  
After merging the said two sorted lists:  
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-20.php)

**21.** Write a Python program to push three items into the heap and print the items from the heap. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
('V', 1)  
('V', 2)  
('V', 3)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-21.php)

**22.** Write a Python program to push three items into a heap and return the smallest item from the heap. Also Pop and return the smallest item from the heap. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
Items in the heap:  
('V', 1)  
('V', 3)  
('V', 2)  
----------------------  
The smallest item in the heap:  
('V', 1)  
----------------------  
Pop the smallest item in the heap:  
('V', 2)  
('V', 3)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-22.php)

**23.** Write a Python program to push an item on the heap, then pop and return the smallest item from the heap. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
Items in the heap:  
('V', 1)  
('V', 3)  
('V', 2)  
----------------------  
Using heappushpop push item on the heap and return the smallest item.  
('V', 2)  
('V', 3)  
('V', 6)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-23.php)

**24.** Write a Python program to create a heapsort, pushing all values onto a heap and then popping off the smallest values one at a time. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
[10, 20, 20, 40, 50, 50, 60, 70, 80, 90, 100]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-24.php)

**25.** Write a Python program to get the two largest and three smallest items from a dataset. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
[100, 90] [10, 20, 20]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-25.php)

**26.** Write a Python program to create a queue and display all the members and size of the queue. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
Members of the queue:  
0 1 2 3   
Size of the queue:  
4

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-26.php)

**27.** Write a Python program to find whether a queue is empty or not. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
True  
False

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-27.php)

**28.** Write a Python program to create a FIFO queue. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
0 1 2 3

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-28.php)

**29.** Write a Python program to create a LIFO queue. [Go to the editor](https://www.w3resource.com/python-exercises/heap-queue-algorithm/index.php#EDITOR)  
Sample Output:  
3 2 1 0

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/heap-queue-algorithm/python-heapq-exercise-29.php)