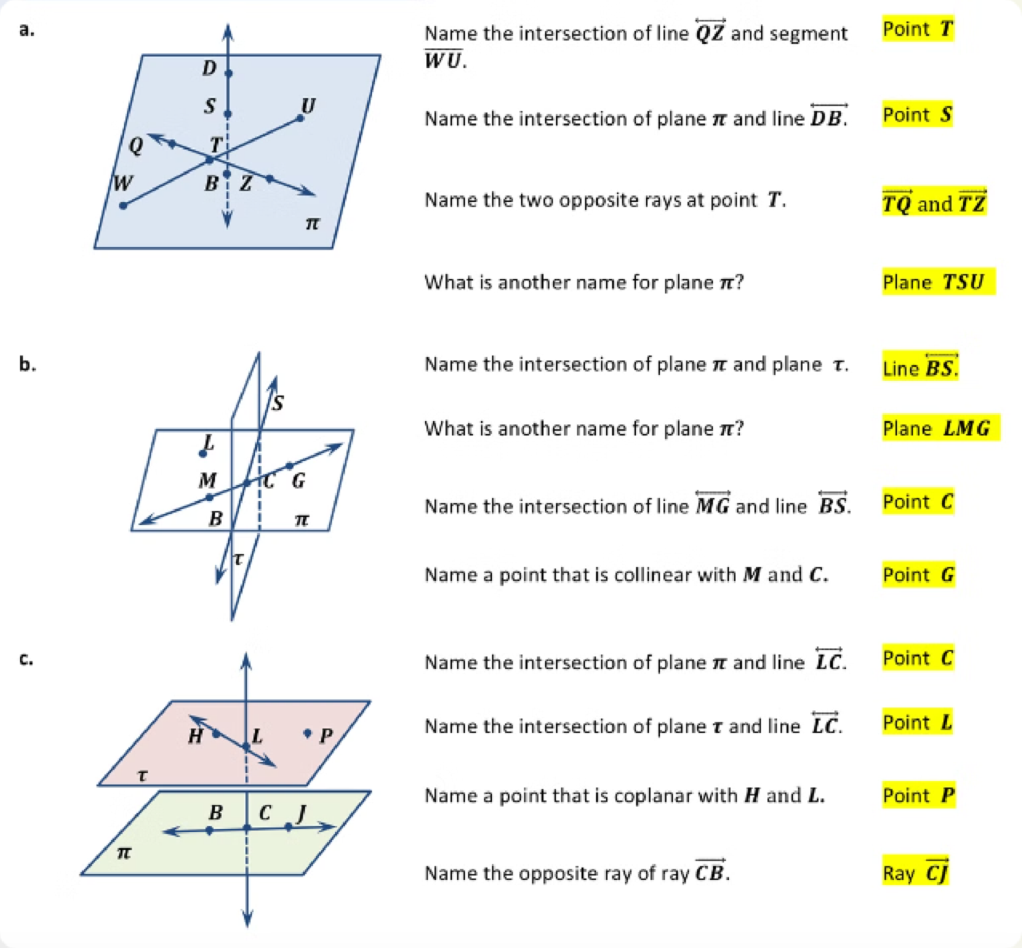


D
S
U
Q
T
W
B
Z
π
L
S
M
C
G
B
π
τ
H
L
P
τ
B
C
J
π

a.	Name the intersection of line $\overleftrightarrow{QZ}$ and segment $\overline{WU}$.	Point T
	Name the intersection of plane π and line $\overleftrightarrow{DB}$.	Point S
	Name the two opposite rays at point T.	$\overrightarrow{TQ}$ and $\overrightarrow{TZ}$
	What is another name for plane π?	Plane TSU
b.	Name the intersection of plane π and plane τ.	Line $\overleftrightarrow{BS}$.
	What is another name for plane π?	Plane LMG
	Name the intersection of line $\overleftrightarrow{MG}$ and line $\overleftrightarrow{BS}$.	Point C
	Name a point that is collinear with M and C.	Point G
c.	Name the intersection of plane π and line $\overleftrightarrow{LC}$.	Point C
	Name the intersection of plane τ and line $\overleftrightarrow{LC}$.	Point L
	Name a point that is coplanar with H and L.	Point P
	Name the opposite ray of ray $\overrightarrow{CB}$.	Ray $\overrightarrow{CJ}$

Minimum Cost to Connect All Points

Efficiently connect all points on a 2D plane using the minimum total total Manhattan distance.

Graph Representation

Nodes

Each point is a node in the graph.

Edges

Edge weight is the Manhattan distance between two points.

points.

Prim's Algorithm

1

Start

Begin with an arbitrary starting node.

2

Grow MST

Iteratively add the minimum weight edge.

3

Completion

Stop when all nodes are in the MST.

Please go to polling booth number one
next booth: 01
number three. it is located straight ahead
next booth: 03

Priority Queue

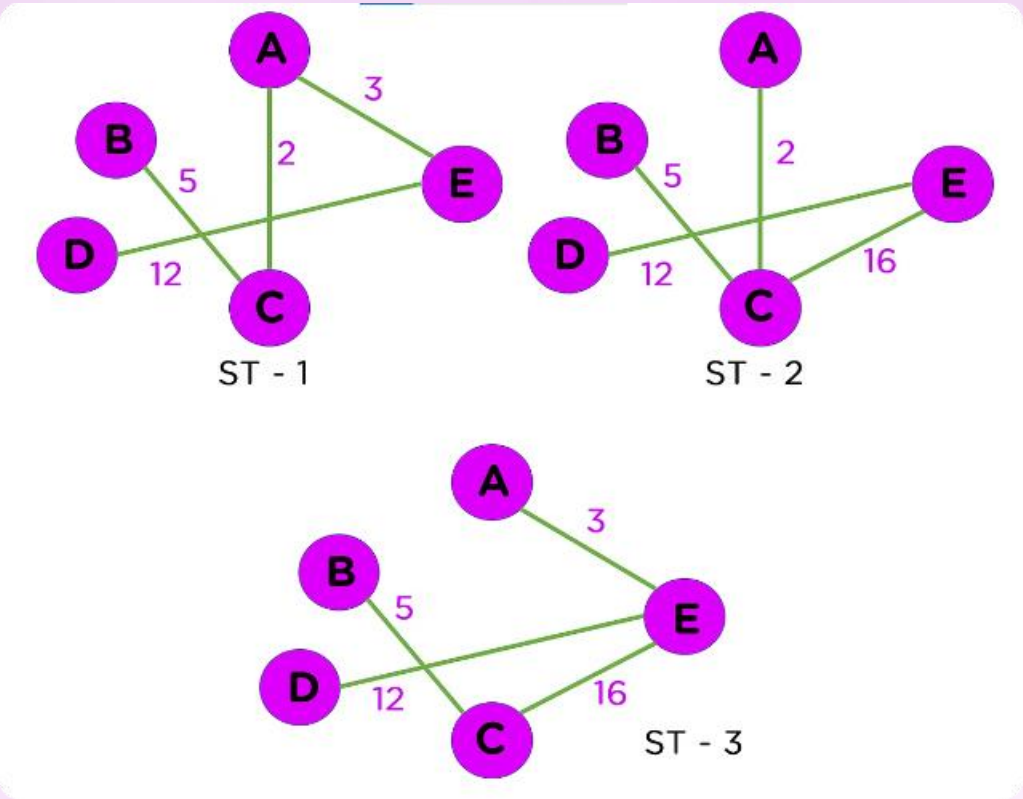
Efficient

Quickly retrieve the minimum edge cost.

Incremental

Add new edges as nodes are included.

Minimum Spanning Tree



1

Connectivity

Ensures all points are connected.

2

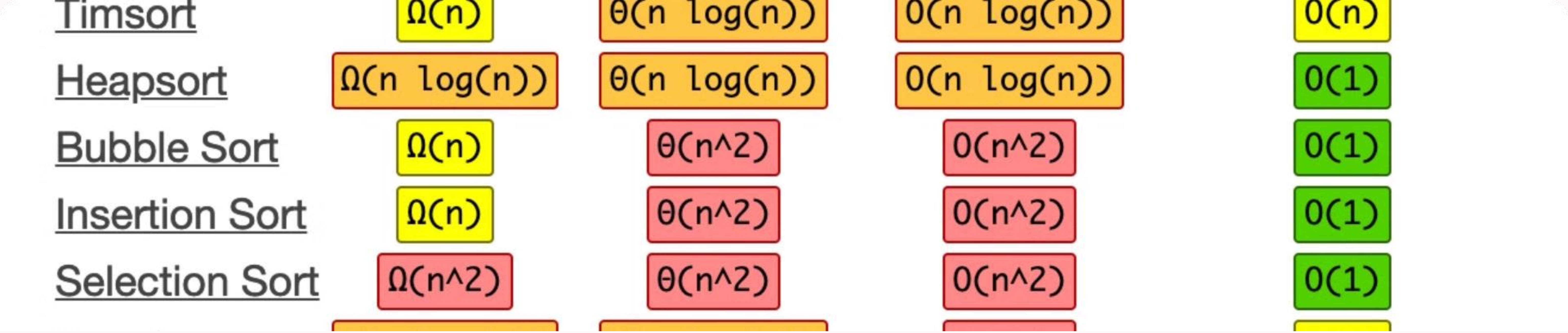
Minimal Cost

Minimizes the total Manhattan distance.

3

Acyclic

Forms a tree structure without cycles.



Timsort	Ω(n)	Θ(n log(n))	O(n log(n))	O(n)
Heapsort	Ω(n log(n))	Θ(n log(n))	O(n log(n))	O(1)
Bubble Sort	Ω(n)	Θ(n^2)	O(n^2)	O(1)
Insertion Sort	Ω(n)	Θ(n^2)	O(n^2)	O(1)
Selection Sort	Ω(n^2)	Θ(n^2)	O(n^2)	O(1)

Time Complexity

Graph

O(V^2)

Priority Queue

O(E log V)

Overall

O(E log V)

Space Complexity

1

Graph

O(V^2)

2

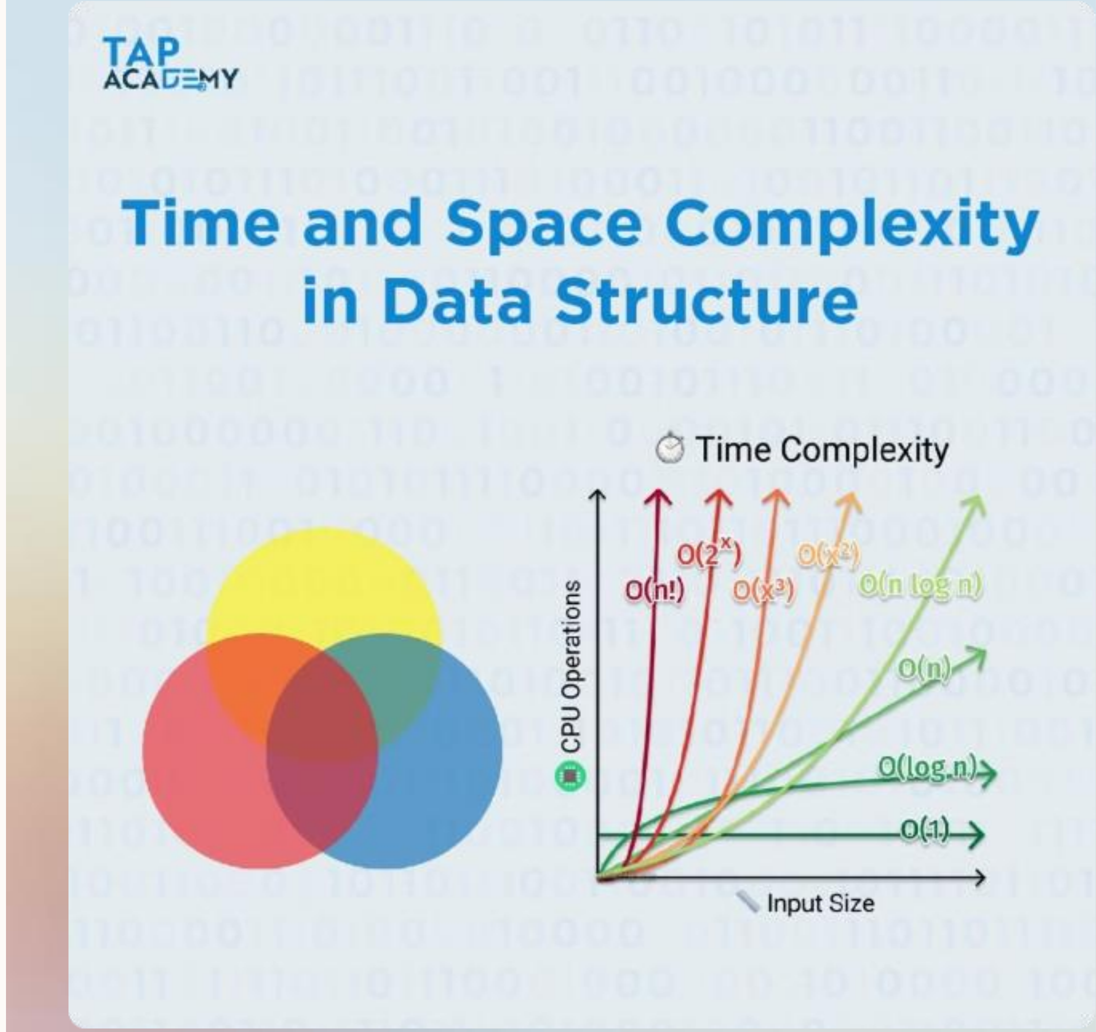
Priority Queue

O(E)

3

Total

O(V^2 + E)



Key Takeaways

Efficient

Prim's algorithm with priority queue.

Optimal

Minimum spanning tree ensures minimal cost.

Connectivity

All points connected with unique paths.