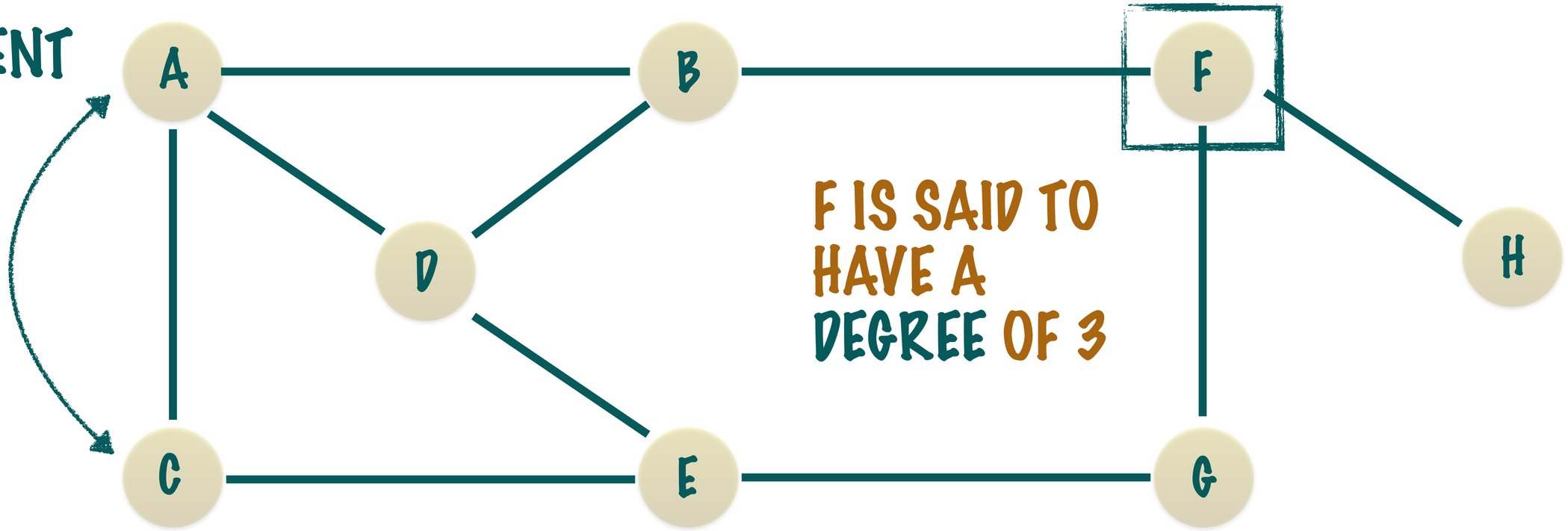
WHAT IS A GRAPH?

UNDIRECTED GRAPH

A AND C ARE ADJACENT NODES

3 EDGES ARE INCIDENT ON VERTEX F

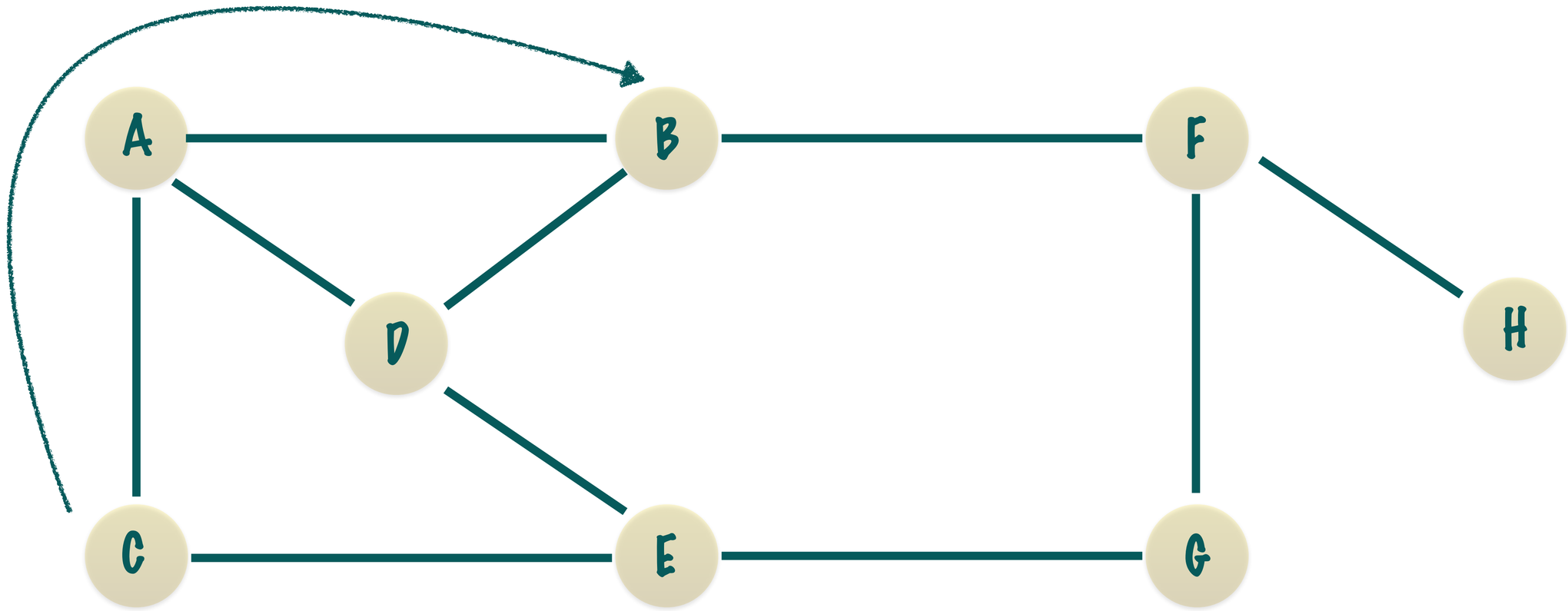


F IS SAID TO HAVE A DEGREE OF 3

WHAT IS A GRAPH?

UNDIRECTED GRAPH

THERE IS A WAY TO GET FROM NODE C TO B



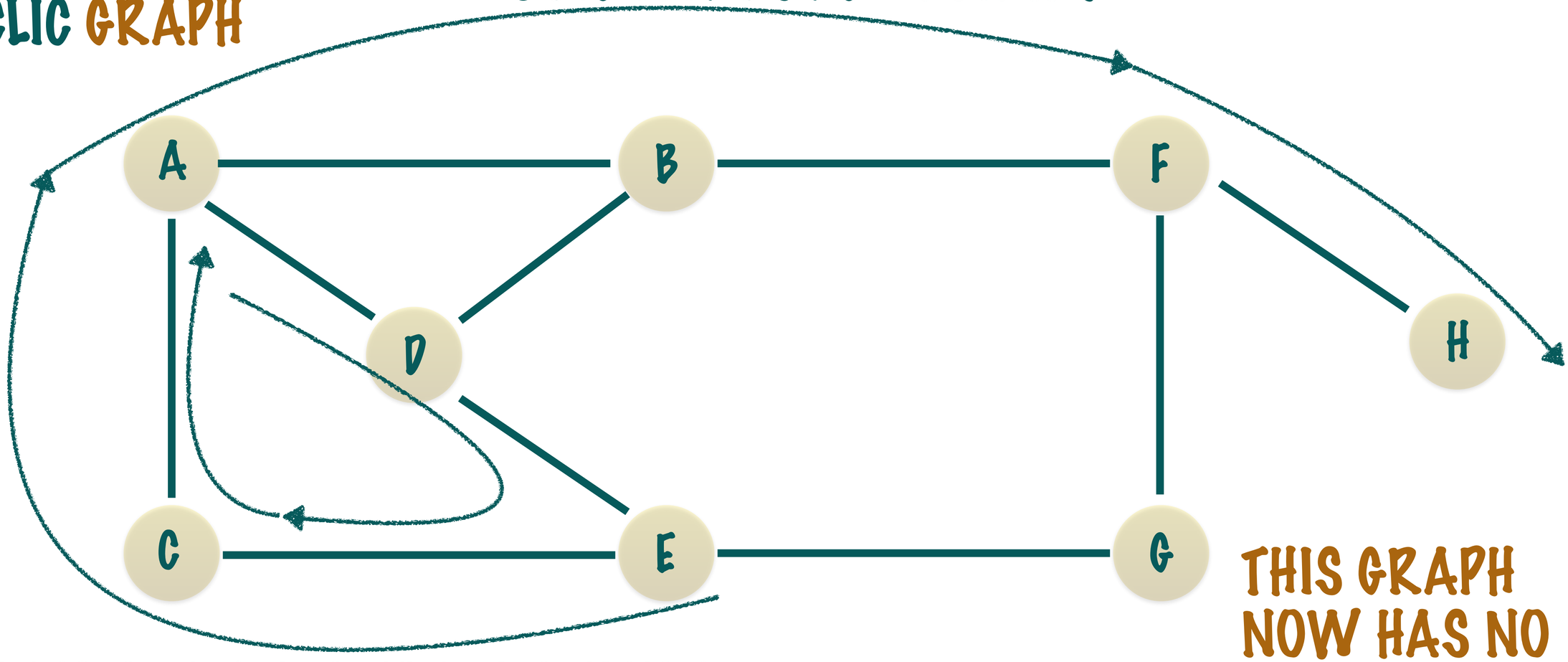
C -> A -> B

THIS SERIES OF EDGES IS CALLED A PATH

WHAT IS A GRAPH?

THIS IS NOW AN UNDIRECTED ACYCLIC GRAPH

UNDIRECTED GRAPH



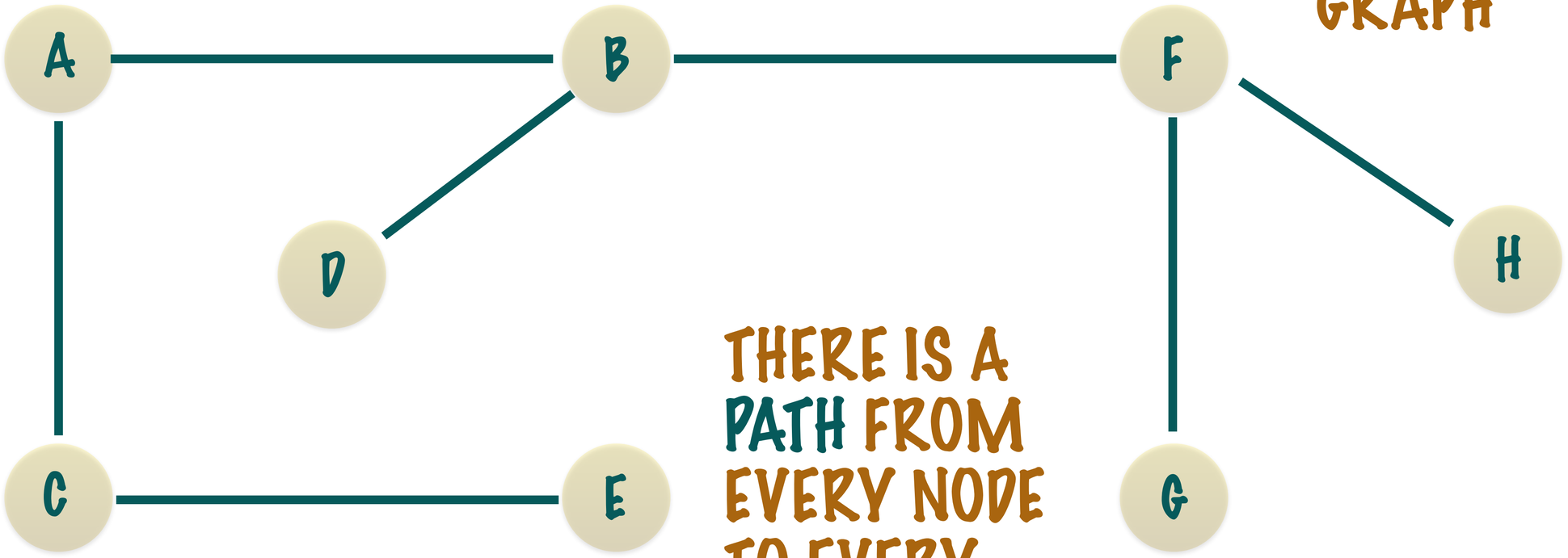
NODES A, D, E, C, A FORM A CYCLE

THIS GRAPH NOW HAS NO CYCLES

WHAT IS A GRAPH?

UNDIRECTED GRAPH

NOTE THAT EVERY NODE IS CONNECTED TO EVERY OTHER NODE VIA A SERIES OF EDGES

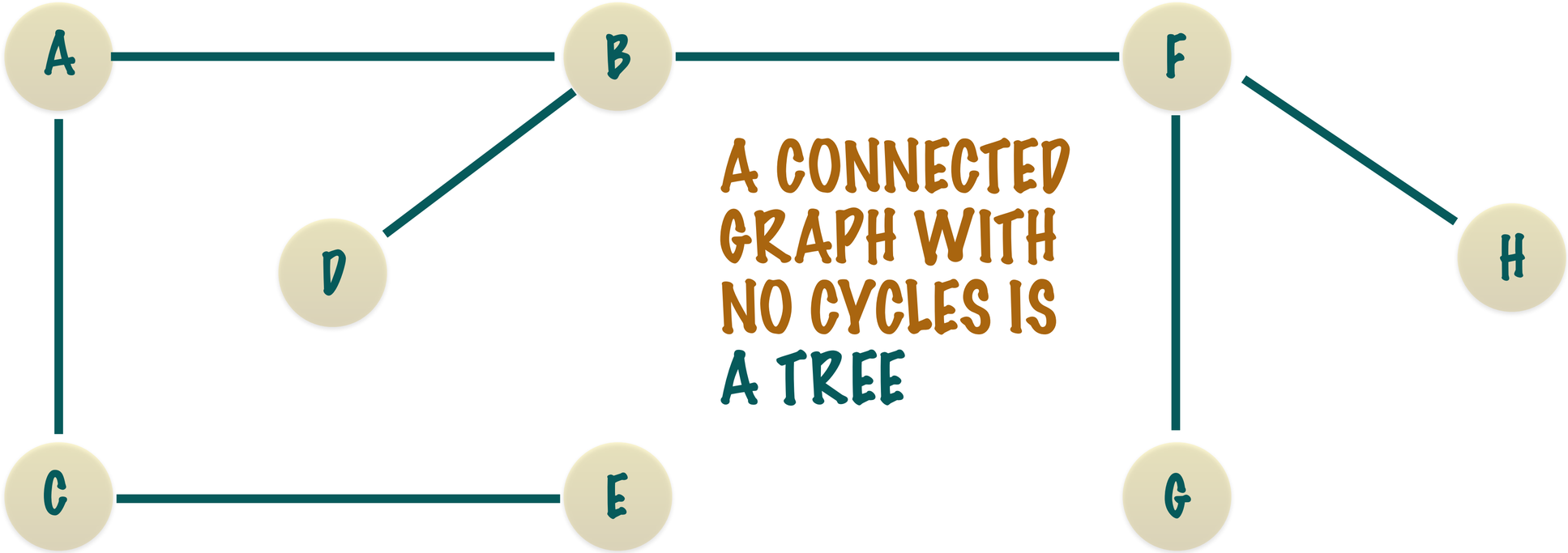


THIS IS A CONNECTED GRAPH

THERE IS A PATH FROM EVERY NODE TO EVERY OTHER NODE

WHAT IS A GRAPH?

UNDIRECTED GRAPH

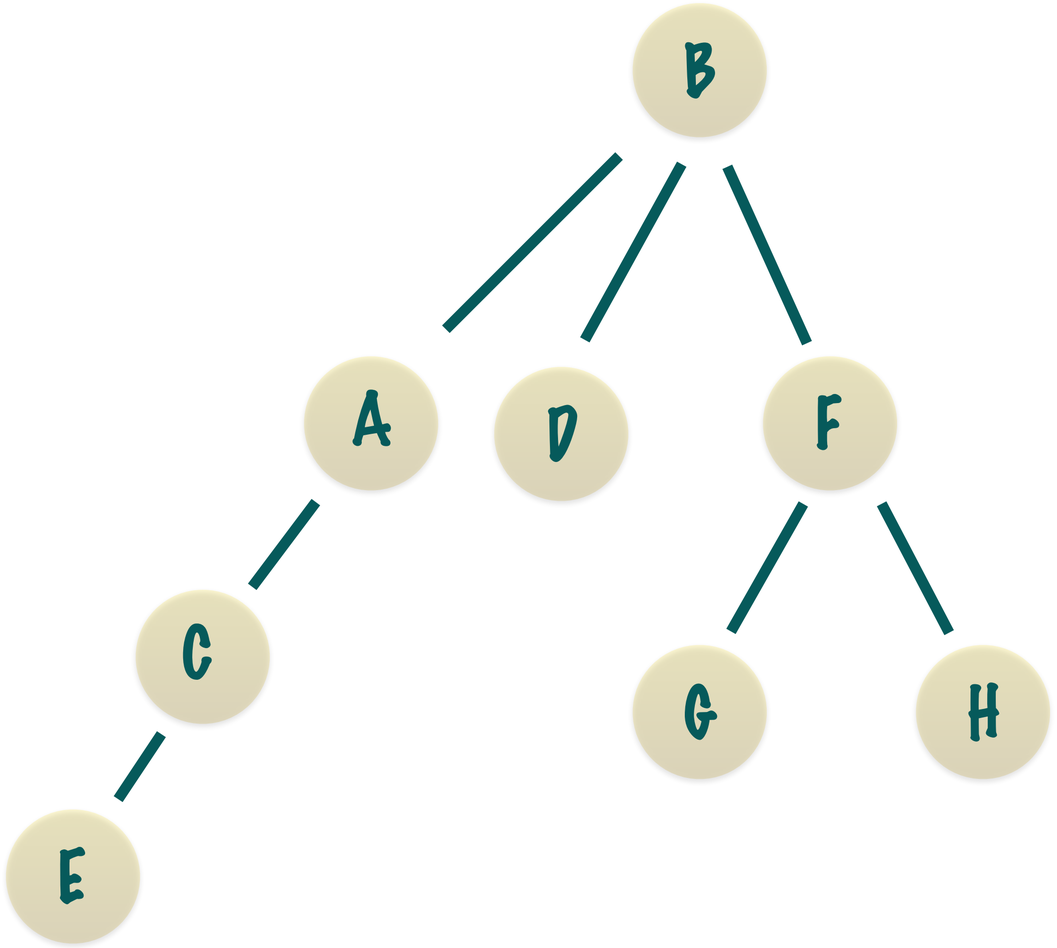


A CONNECTED GRAPH WITH NO CYCLES IS A TREE

WHAT IS A GRAPH?

UNDIRECTED GRAPH

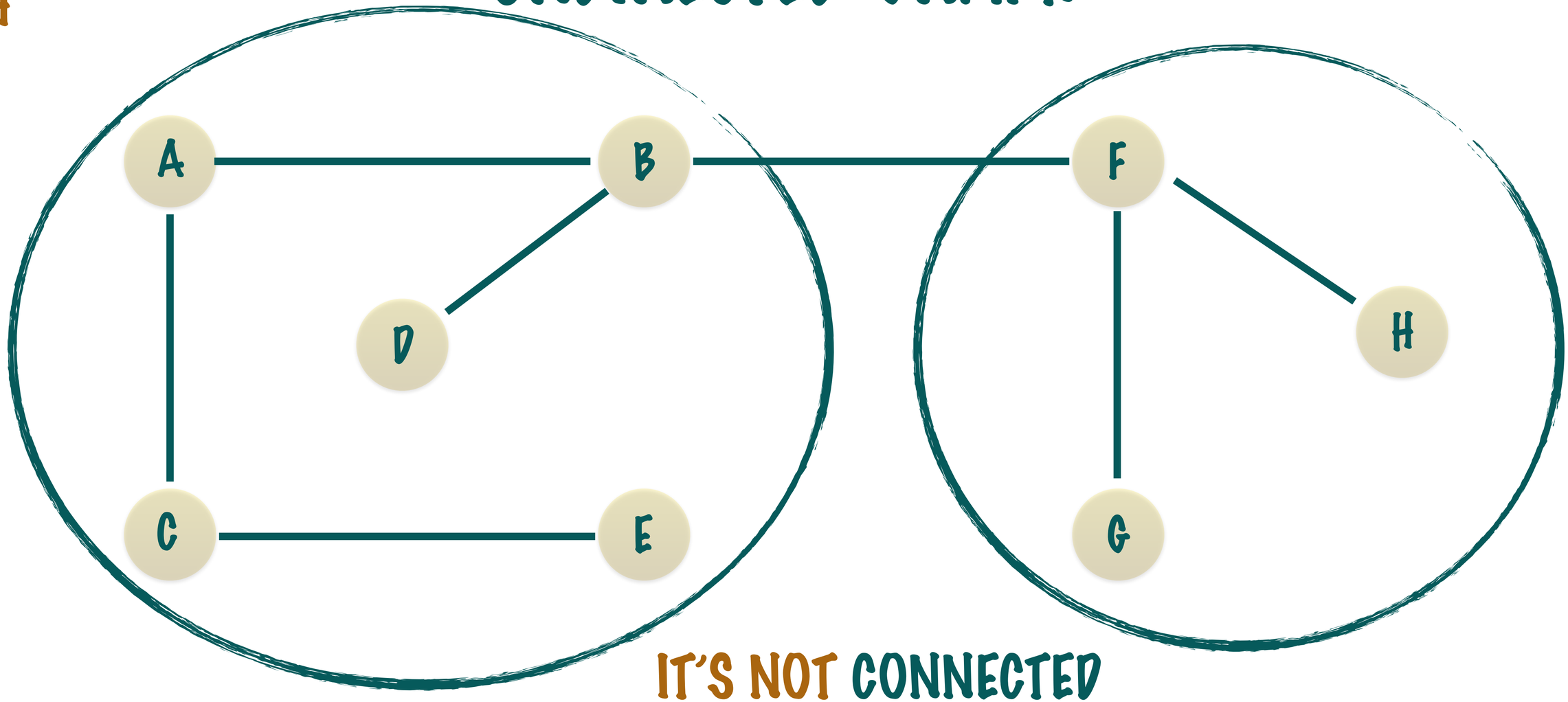
A CONNECTED GRAPH WITH NO CYCLES IS A TREE



WHAT IS A GRAPH?

THIS IS ALSO A GRAPH

UNDIRECTED GRAPH

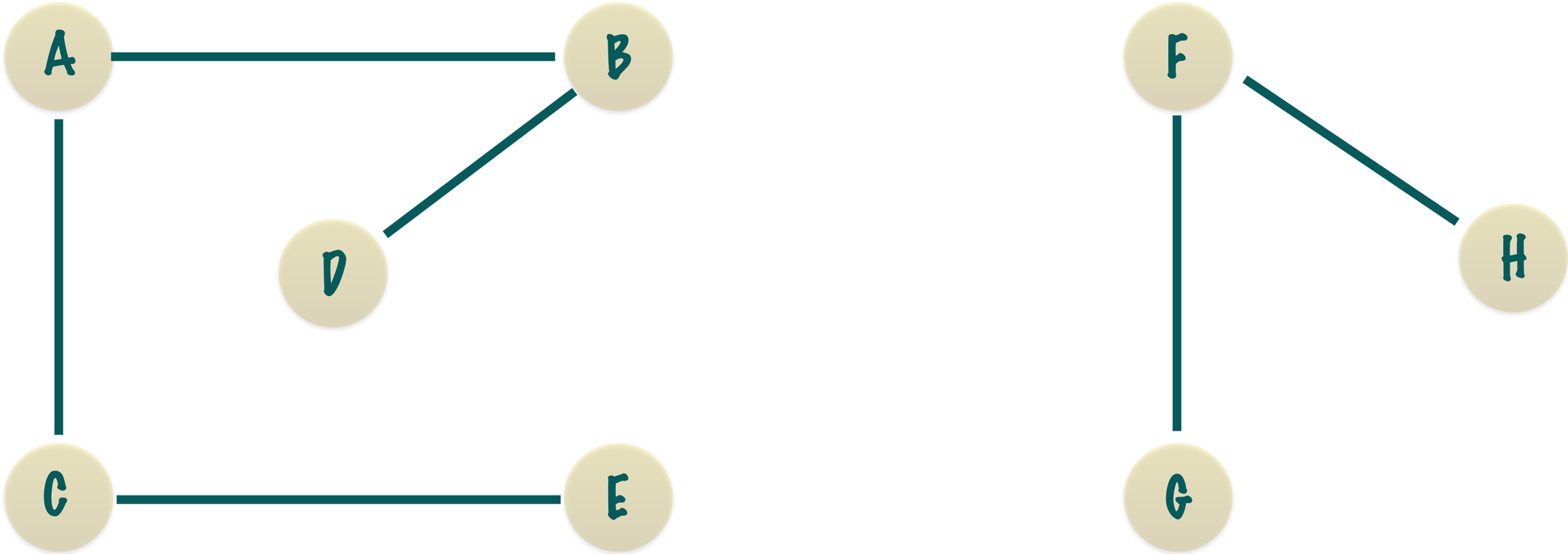


IT'S NOT CONNECTED

WHAT IS A GRAPH?

UNDIRECTED GRAPH

EACH GRAPH HAS NO CYCLES SO THEY ARE BOTH TREES



THIS GRAPH IS A FOREST - A DISJOINT SET OF TREES

WHAT IS A GRAPH?

UNDIRECTED EDGES REPRESENT
2-WAY RELATIONSHIPS SUCH AS:

1. TWO WAY ROADS
2. I AM HIS FRIEND AND HE IS MINE

UNDIRECTED

DIRECTED EDGES REPRESENT
1-WAY RELATIONSHIPS SUCH AS:

1. ONE WAY ROADS
2. I REPORT TO MY MANAGER

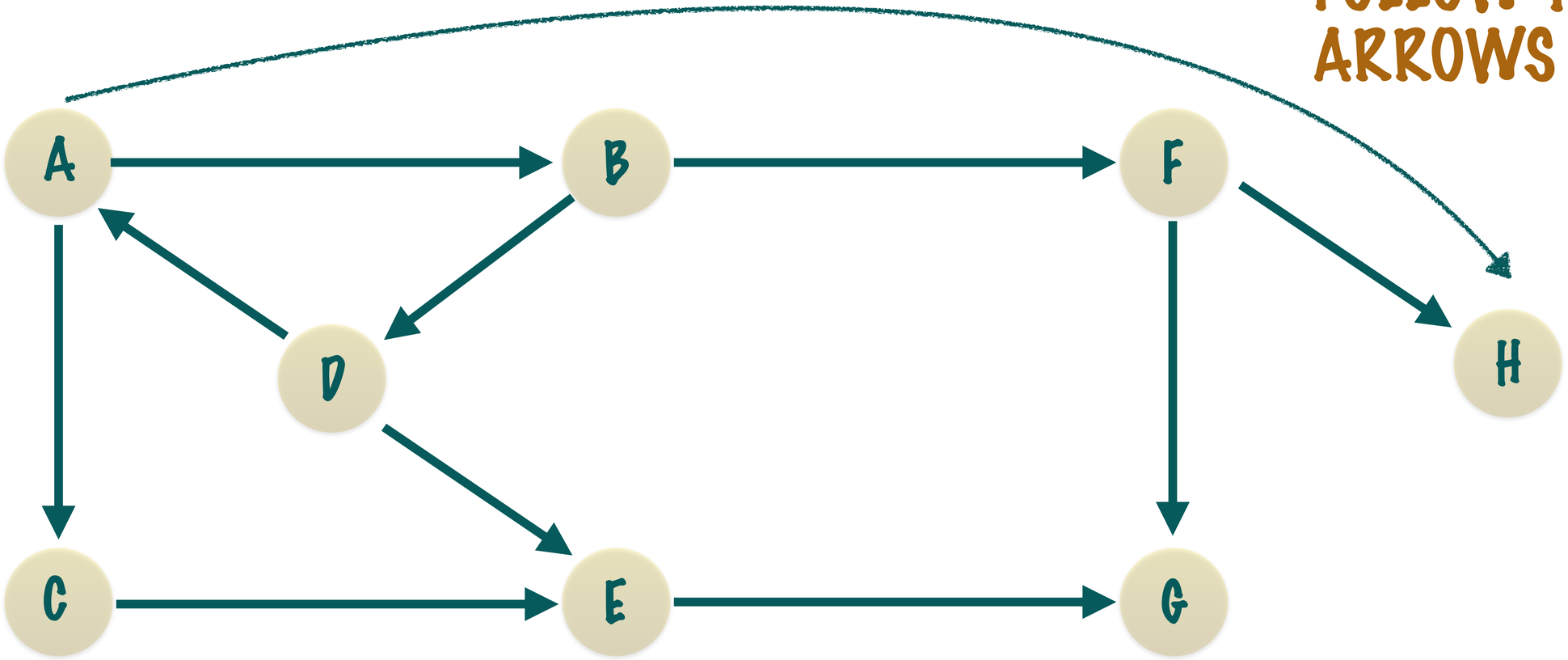
DIRECTED

WHAT IS A GRAPH?

DIRECTED GRAPH

THERE IS A WAY TO GET FROM NODE A TO H

NOTE THAT THE PATH NEEDS TO FOLLOW THE ARROWS



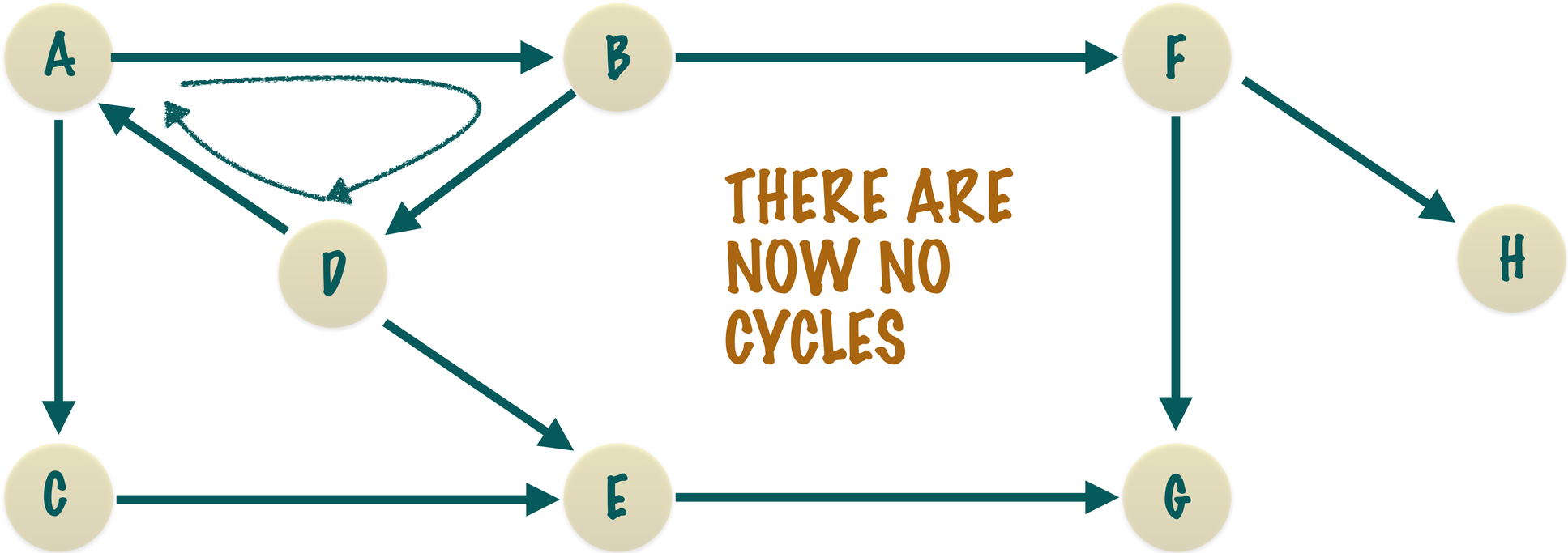
A -> B -> F -> H

THIS SERIES OF EDGES IS CALLED A PATH

WHAT IS A GRAPH?

THIS IS NOW AN DIRECTED ACYCLIC GRAPH

DIRECTED GRAPH



THERE ARE NOW NO CYCLES

NODES A, B, D, A FORM A CYCLE

THIS IS THE ONLY CYCLE IN THIS GRAPH