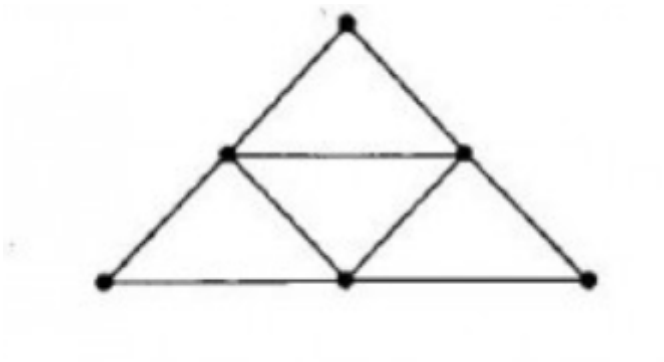
find out the no. of spanning tree possible

asked in **Algorithms** May 2, 2015
edited Aug 7 by **soujanyareddy13**

3,509 views

12

How many spanning trees are possible from the graph given below?



A. 24
B. 34
C. 44
D. 54

Gunjan Rathore 3.5k views

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3 Comments

Shubham Sharma 2 commented Feb 5, 2017
Explain how u calculate number of graph with 3 length cycle.

0

Rohit Pandey commented Aug 31, 2018
@digvijay Pandey

The no of cycle of length 3 is 4

check out this https://gateoverflow.in/202571/spanning-tree

0

2 Answers

9

total 9 edges and 6 vertices..
for spanning tree we need 6 vertices and 5 edges..
no of graphs with 5 edges : 9C5
no of graph with 3 length cycle (may be disconnected) = select any cycle of length 3 (select any small triangle) and then out of 6 vertices select any 2..
= (6C2)*3 + 12(for middle triangle) = 57

find no of 4 length cycle = select 4 length cycle and for rest 1 edge select those edges which doesn't produces 3 length cycle..
= 4 + 4 + 4 = 12

no of 5 length cycle = 3

total spanning tree = 126 - (57 + 12 + 3)
= 126 - 72
= 54

answered May 2, 2015

Digvijay Pandey

but it is a 6*6 matrix it would be very lengthy to go by above approach?

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Neha Sisodiya commented Jul 12, 2015

Can explain it in detail I m not getting it how the combinations r made.

0

Rachit Saxena commented Dec 9, 2015

Hi,thanks a lot for your response,but I am having trouble understanding the combinations to calculate the number of cycles.Could you elaborate more?

0

mcjoshi commented Aug 23, 2016

Please elaborate ??

0

Akhilesh Yadav 1 commented Dec 28, 2016

@ Digvijay Pandey

How possible no. of subgraph with the middle triangle is 12? Shouldn't this be 6C2? please explain.

2

papesh commented May 4, 2017

@Akhilesh Yadav since, if we select the middle triangle, now we need to select more two edges, there are 3 ways to select two edges such that it will build another triangle which is already taken into account. so 15-3 =12

1

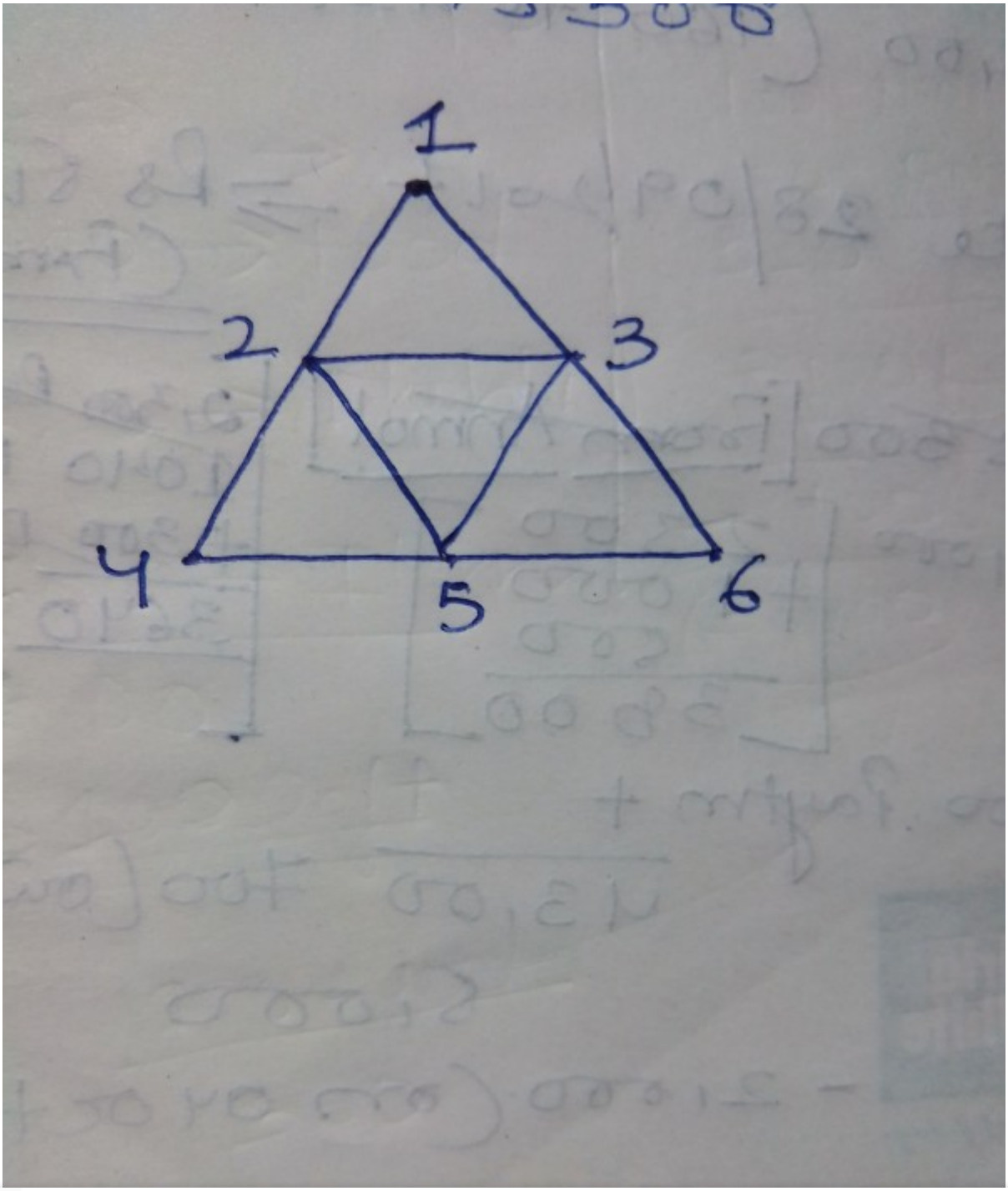
Chirag arora commented Jan 9, 2018

If combination forming for this question is getting difficult for someone...then...you can go with Kirchoff's algorithm also...the only disadvantage is it gets lengthy...but if you are fast with determinant calculations...then...this algo is simple and best!

For those who are facing difficulty ...with spanning tree questions..

1

4



i have numbered the node.

total edges are 9 .For mst edges will be v-1=5

step 1 : total combination

9c5=126

but this combination contains 3 edges,4edges,5 edges cycle.so subtraction from these must be done.

step 2: finding 3 edges cycle

3 edges cycle are (123,245,235,356)- 4 cycles

now for each cycle 2 edges are remaining so choosing those 2 edges will take 6c2 ways.

total=4*6c2

but if we choose 2 more edges then there may be chances of getting 4 edges cycle.

for example- in cycle 123 if we choose edge 5-3 and 2-5 cycle 1253 is possible,in cycle 235 if we choose 2-4 & 4-5 then 2354 is possible also in same cycle if we choose edge 3-6,5-6 then cycle 2365 is possible.

3 EDGES CYCLE FORMED	EDGES ADDED	4 EDGES CYCLE
123	5-3,2-5	1253
245	2-3,3-5	2354
235	5-4,2-4 or 3-6,5-6 OR 1-2,1-3	2354 OR 2365 OR 1253
356	2-5,2-3	2365

so total 6 (4-edges cycle) will be formed so we must remove this 6 cycles

4*6c2-6=54

case 3: finding 4 edges cycle (1253,2453,2563)

choosing the fifth edges will take 5c1 ways but we have to careful that choosing 5th edges can lead us to 5 edges cycle.

So 3 5EDGES WILL BE FORMED SO WE MUST REMOVE THESE 3 CYCLES 3*5c1-3=12

case 4:choosing 5 edges cycle(231253,253245,532563,421354,521365,236542)

total 6

final answer:126-(54+12+6)=54

answered Nov 9, 2018

adarsh_1997

2 Comments

HeadShot commented Jan 4, 2019 edited Jan 4, 2019 by **HeadShot**

@adarsh_1997

one doubt :

While considering 5 edge cycles... 3 are actual 5 edge cycles. But the rest what you took are 2 - 3 edge cycles with 1 edge common and which i guess are already covered in 3 edge cycles. isnt it ?

p.s :

I got my mistake :

Its like, even if are repeating the cycles , it is still a different count coz it is formed during different edge count.

is it fine ?

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Next Qn. in Sub. →

Answer: 54

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Consider a graph whose vertices are points in the plane with integer coordinates (x, y) such that 1<=x <= n and 1 <= y <= n, where n >= 2 is an integer. Two vertices (x1, y1) and (x2, Y2) are adjacent iff |x1 -x2| <= 1 and ly1 - ... (y1 - y2)2). What is the weight of a minimum weight-spanning tree in the graph? a) n-1 b) n+1 c) n d) log n

asked in Programming Jul 12, 2016

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1 #3

How many Spanning Trees are possible from the graph?
How many Spanning Trees are possible from the graph given below? (a) 24 (b) 34 (c) 44 (d) 54

asked in Algorithms May 3, 2017

0 #4

Ace test series question on number of spanning trees possible

asked in Algorithms Jan 24, 2019

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