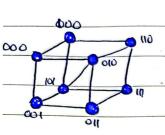
	Umeman Husser
	211-1858
Date Assignment 1	6-1
0.1	
	Cut - Through 5 alm
I.) 2D Mesh without wreepwround	
Ich eine Leann ar tall "alib" Leman alam	e day victoria caredio ke
90ws: JP Num of	links in each now: 1P-1
Col: No Num of	links in each col: NP-1
Num of Nodes: ApxAp	The second second second
Nin it like per a company	talas and a
rogitar pala materia	
Cost: 7000s (Num of Links) + col (Num of Links	$1 = \sqrt{p(\sqrt{p-1})} + \sqrt{p(\sqrt{p-1})}$
in each tow in each col)
Cost: p-1p+p-1p = 2p-21p = 2(p-1p)	= 2(9-3) = 2(6) = 12
Dilumeter: (Num of links) + (Num of links) = i	TP-1+170-1 = 2170-2
in each now in each col	= 2(VD-1)
	2(19-1)=2(2)=1
Bisation Weath: Num of nows/Num of col =	NP = N9 = 3
Anc-Connectivity: 2	
ii) 20 Mesh with wresporound	
Num of Nodes = P Dieum	eter: 2 No. of rows/col
Mows: NP	L 2 J
col: AP Diamet	ex:2 10 = 2 3
C + 261 0 11 1 00 - 261 - 18	2[1.5] = 2(1)
Cost: 2 (Num of Nodes) = 2p = 2(9) = 18	
Bisection Weath: 2 (rows/col) = 21/p = 21/9	* 0.3.0
Anc Connectivity:4	

iii.) 3-1) Cube



Num of nodes = p

Cost: every node how 3 connections so px3

To evoid double counting it becomes px3 = 8x3 = 12

This will hold true for all cube topologies with 3 connections

Diameter: Each node is directly connected to its adjusent nodes in these dimensions (2, y and z). The farthest two nodes in the network we those placed at the opposite corners of the cube so

Length of shortest puth using edges = 1+1+1=3

Bisection Wilth= num of nodes = 8 = 4, we can cut along both

2 2 2 2 2 or y-anis, in both

cersel, unswer will be the same

Arc-Connectivity = 3

^ Since each node is connected to there adjacent nodes

iv.) Linear Array without wrespersound

Num of nodes= P

Cost: Num of nodes $-1 = \rho - 1 = 5 - 1 = 4$ Diameter = $\rho - 1 = 5 - 1 = 4$ Bisection Width = 1 April Connectivity = 1

V.) Linewiz Array with Wrap Arround	
Cost: P Bi	section Width: 2
Diemeter: 1 A	91c-Connectivity:2
and the state of t	
yi.) Hyper Cube:	
twicting in the control of the	o the est and block the state
An a hypercube network with p nodes, p is	expouse of 2, denoted as 2k
where k is the number of elimentions	i ei a signilat animali.
Each node is connected to log p other	nodes a la marcha de la marcha della de la marcha de la m
ug sit i i ver	a lings with the leady of it.
Cost: Since there we p nodes in tot	el = plogp
To avoid clouble counting it becomes: pla	Y2P
2	
Diameter: The furthest two nodes were to	•
corners so the formula in a hypercube n	
P=2k, the man dist b/w any two	nocles is R
Ex R = loger Demoter 100	
Diameter = 1092	Propries de la companya della compan
Arc-Connectivity: Since each nocle is a so that is it's wire-connectivity.	onnected to log p other nodes.
galola qualitation of allola	00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Bisection Width: Since the num of no cut through P edges to clivide the hi	odes is p, we need to
	percube in half.
2	Fig. 2 - 1 - 9 = statement()
	b addity without



Vii) Complete Binory Tree:-	of ober or more atto
flexications story with many and the	Experience of the control of
Each node (except the most) h	
3 can have at most two childre	en nades
Cost: P-1 (evory node eucept groot has	s enautly one incoming edge).
Diameter: The depth of a binary tree i	with p nodes is log,p
To accomodate the case where p is not a	power of 2 we add 1
So it becomes: log(p+1)	
	S. San red
The lungest path in a binary tree goes from	m deepest leaf node to another
deepert leaf node, we count both upward 3 o	downward traversals.
- La selfraciones a rivari	ge of the lipson shorthad
diameter: 2 log (P+1) > floor to	value for height 2 (741)
upward 3 downward & L 2	(b) L 2 1
travelsal solvide by 2 to ge	t height 2 = 2,69(4)
	<u> </u>
Bisection Width: 1 . Arc-Conne	ectivity:1
indistring whetalians the	
viii.) Completely Connected:	: Sagarde
	9 + 1.12 ava 1)
	is connected to every other node)
Arc-Connectivity: p-1	
Bisection Width: Divide the network into two	
contain p nodes, and each node in one group	
node in the other group so	Automati Walat ot
$\frac{P \times P}{2} = \frac{P^2}{2} = B^9 \text{ section}$	
22 4 Width	

Cost: Num of nodes:p	each node is connected to
Num of edges: p-1	every other node except itself
de la Sacricia de Vicinsia de Cabra	estima de la lei de la
To avoid double counting: p(P-1) te con la section : « « e e e
	λ
O. 2 which is a string of the	there also because it soil a decide
Completely Connected	Mesh
Cost:	and the state of t
P(P-1)	$2(p-\sqrt{p})$
each node 2	
1 convected to all other nades	each nade connected to immediate
Alaking of the same and a	neighbows only
Qualreatic Complexity: p	Linear Complexity & P
Crets expensive when rum of	, ja si, "A, sikhričj
nodes increase	1 22 1 1 1 200
Marie S. F.	
Asic Connectivity:	
Man ac: p-1	2; lower ac in comparison
	to completely connected
Diumeter:	· babam T voldina inv
1; highest level of	2(NP-1); Maderate Connectivity
connectivity possible	directly connected to immediate neighbour
Bisection Weath:	to when fit along a supply with the melinest
P2 relatively high compared	IP, low compared to make
4 to Mesh Network	completely connected
	- DxD - 1 - QxD
	1111111 11 6 6
with the state of	

Completely (annected offers low latency as the diameter is I and there is no need to traverse multiple hops BUT as the num of nodes grow, the num of connections increase rapidly which leads to scalability issues.

Mesh Networks we more scalable than completely connected networks on the increase in num of nodes closs not lead to significant increase in num of edges BUT the cliameter of nodes located few apart cliagonally can result in longer paths.

Completely Connected Interconnection is suitable for exercisis where man connectivity blu nodes is nequired such as high-performing computing applications.

Mesh interconnection networks are suitable for scenarios where moderate connectivity is sufficient such es in distributed systems or small to medium sized networks 3 a balance b/w cost and connectivity is desired.