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3	Name Avinash Srivastava	10: 2018ACO4564
		30.
	MFDS Assignment	
	A 1 1 2 2 2 2 2	7 1 + +
-3-	MUST Let 2 a. dz, any firsz B	my be the hus
<b>3</b>	Ansi) Let fa, az, any, fish B bases of finite dimensional	vector space V.
	: {x, x,, xny is a basis	8- V 4
	S B B B is a live	is ably in day and set
	Set of vectors in V, m <r< th=""><th>1 my veraperating</th></r<>	1 my veraperating
	since LBBB Broling	him of V +
=3	Say as - 2 4 h is a disease	Le liede mandent
-3	Since of Br. Bry is a linear set of vectors in V, & n < m.	ay consequences
	So, man 4 nam =)	h 10
	11 4 (1211)	m = M
	This proves that came the	AD dillunt la
-3	This proves that any the of v will have pre same	landinglitu
=3_	0	- wiperstrug.
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Aus 2>

Let U be an artitarary vector in V. Mince V is
the linear space span of vectors:

Scalars a, n, - am house there exist

U=a,n, +a,n,++. - ain; + - amxim

Further since xi is a linear combination of X1, N2 -- Xi-1, Min 1, - Mm hence there exist scalars b1, b2 -- bi-1, bi+1 -- bm mun that Xi = b1, N1 + b2, X12 + - · · bi-1 Ni-1 + bi+1 Xi+1 + · · · · bm Mm.

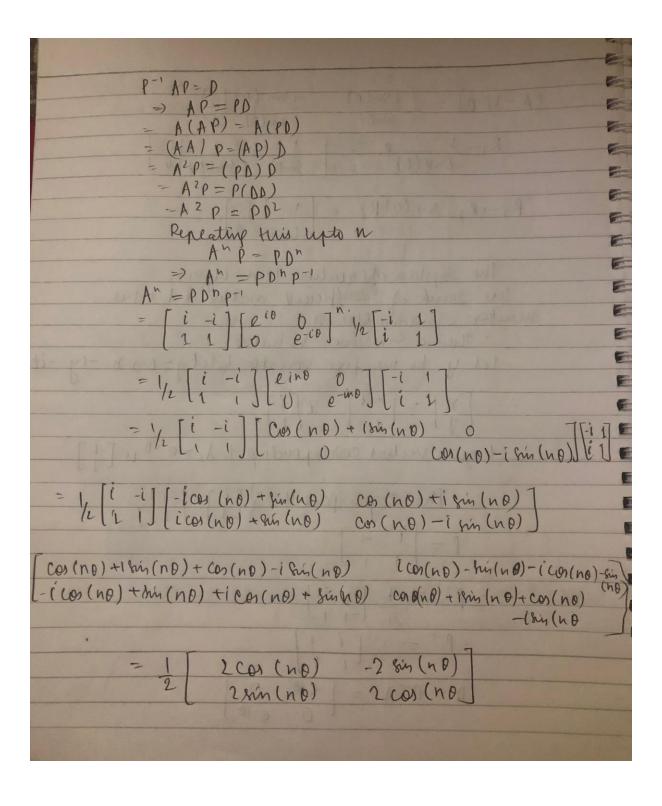
Then  $U=a_1n_1+a_2n_2+...a_1n_1+...a_mn_m=a_1n_1+$   $a_2n_2+...a_{i-1}n_{i-1}+a_i(b_1n_1+b_2n_2+...b_{i-1}n_{i-1}+b_{i+1})$   $\lambda_{i+1}+...b_mn_m)+...a_mx_m=$   $(a_1+a_ib_1)n_1+(a_2+a_ib_2)n_2+...+(a_{i-1}+a_ib_{i-1})$   $\lambda_{i-1}+(a_{i+1}+a_ib_{i+1})n_{i+1}+...(a_m+a_ib_m)n_m.$ Thus, U is a linear combination of vertors  $\lambda_1,n_2...\lambda_{i-1},n_{i+1}...\lambda_m$ .

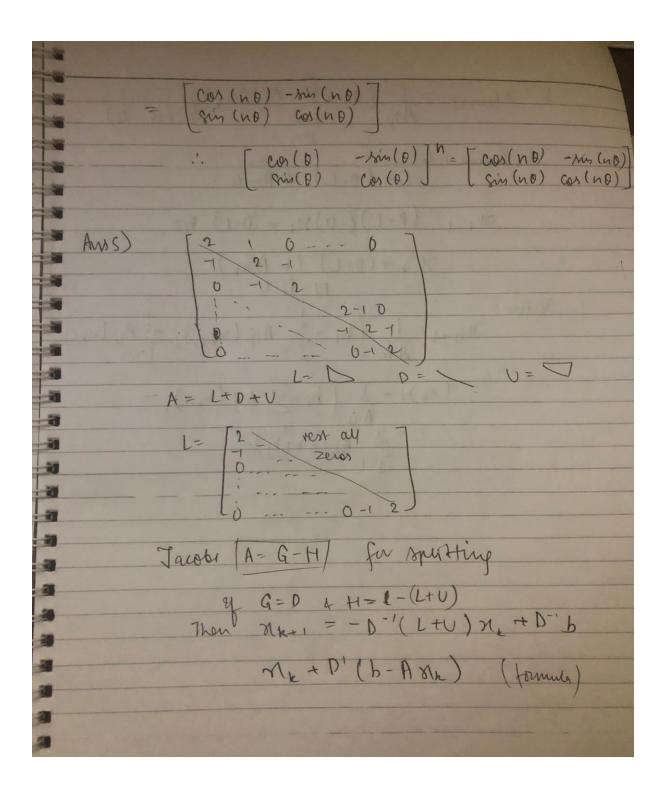
Since u is arbitrary vertor in V, hence the set of  $n_1n_2,...\lambda_{i-1},n_{i+1}...\lambda_m$ .

Aus3) Let V be finish dimensional vector space 4 let 5= f x, ... xm y be any linear Independent -3 let B = S y ... Yn de basis of V. lourider SUB = & x, - xm, 41 - - yn y
Then L(SUB) = L(S) + L(B) = L(S) + V = V Since M: ESEV: : each y can be written as til linear comboination of elements of basis B. i.e di=xy, +xzyz+... dnyn for somexiEF =) Ni= On, +-- Onm +a, y, +azyz+-- an yn ie an element SVB can be written as 3 linear lambination of other elements of -3 SUB. =1 900 6 L.D. get -- Some clements of SUB must be a linear 3 combination of its preceding elements & this element lannot be outer any one of the si: 3 Decause 5 6 L.T. 3 3 Thus some y; is expressible on a linear combination of ets preceding clement of & let then  $y_k = \xi$   $\beta$ ; n:  $+\xi$   $\gamma$ ;  $\gamma$ ; for some  $\beta$ ;  $\gamma$ ;  $\epsilon$  F1

Lounder S, = In, 12 mm, y1, - ykil ykil - ynf Let yev n mon y = Esign + Si EF (15 len (: B is buris of V) E soy, + Skyk E Se 4 + Sk E Bin; + E y; y; = Sk \( \frac{\subset}{2} \) \( \fracanon \simma \) \( \frac{\subset}{2} \) \( \frac{\subset}{2} \) \( =) V= (S,) If S, is L.I, the S, is reg basis centaining But it Sx is lot L.I., hen me go in repeating the above process to get new Set Sx mun that Sx is l.I, <Sx >= V 4 Sx is externor of S. At most by repeating above process me maliget he set in ... now which is given to be I.I. Set & hence it becomes the basis of V. 6 Aur let A- [con(0) -min(0)] min (0) cos(0). The characteristic equation of A is 0=/11-A/ cos(0)-1 -min(0) =0 - (nin (0) Con(0)-1 =) (cos(0)-1)2+mi2(0)=0 = cos2(0) + 12-2 \cos(0) + sin2(0) =0 = 1/2 - 5 Y COX (0) + 1 = 0  $\lambda = -(-2\cos(0)) \pm \int (-2\cos(0))^2 - 4(i)(i)$ =) 1= 2 cos (0) + J4 cos (0)-4 =)  $\lambda = 2 \cos(\theta) \pm 2 \sqrt{\cos^2(\theta) - 1}$  $A = \frac{2 \cos(0) \pm \sqrt{\sin^2(0)}}{2}$   $A = \frac{2 \cos(0) \pm 2i \sin(0)}{2}$ 1= con(01 + 1 sin(0)

4
Now white the augmented matrix for $h_i = e^{i\theta} = \cos(\theta) + \sin(\theta)$
Now white the augmented matrix for $h_i = e^{i\theta} = \cos(\theta) + e^{i\theta}$
i & (8)
$(A-NIO) = \begin{pmatrix} -(mN(V) - mn(O) & 0 \end{pmatrix}$
$[A-NIO] = \begin{pmatrix} -i\sin(\theta) & -\sin(\theta) & 0 \\ \sin(\theta) & -i\sin(\theta) & 0 \end{pmatrix}$ $[Ain(\theta) & -i\sin(\theta) & 0 \\ \vdots$
$R \rightarrow -1$ $R \rightarrow -1$ $[0]$
$\begin{array}{c} R_1 \rightarrow -\frac{1}{i \left( \sin(0) \right)} & R_1 \rightarrow \left( \frac{1}{i \sin(0)} - i \sin(0) \right) \end{array}$
5-101 mx + 1/2-(076.01)
$R_i \rightarrow R_i - Sin(0)R_i \rightarrow \begin{pmatrix} 1 & -i & 0 \\ 0 & 0 & 0 \end{pmatrix}$
The system of Equation is N-14=0
The system of Equation is $x - iy = 0$ The rank of the cy coefficient matrix is 1 and  number of variables is 2.  There is 1 free variable.
. There is I free voriable.
11 (3) (3) (4) (4) (5) (6) (6) (6)
number of variables is 2.  There is 1 free variables.  Let y be the free variables, let y=t => n=iy=it.
· r · 7 [: + 7 · · · [: ] · (a) · · · ·
$\frac{1}{2} \left[ \frac{1}{2} \right] = \left[ \frac{1}{2} \right] = \left[ \frac{1}{2} \right]$
A COLUMN
Eigen vector corresponding to 1, = e'o is [i]
Now muste augmentated matrix for h= e-10=cos(0)
(8) (8) (8) (8) (8)





 $A = M(k+1)i = \frac{1}{Aij} \left( bi - \sum_{j=1}^{N} Ajj'(n+1)j \right) i = 1,2,3,4$ 4 Gauss hodel
G= (D+L) 4 H=- 4 ME+1= (D+L) (-W) Nx+ (D+1)-1 b= N = D + L N == (nk)i + 1 (bi - \( \) Ajj (nk+1); 
A ii \( \) \( \