Recall. [83]

(8,21) V is a complex vertor space. $T \in L(U)$ $\lambda_1, \dots, \lambda_m$ are distinct eigenvalues

$$\Delta V = G(T, \lambda_1) \oplus \cdots \oplus G(T, \lambda_m)$$

b) Each $G(T, \lambda_i)$ is ino. under \overline{L} .

 $(T-\lambda;1)|_{G(T,\lambda;)}$ is nilpotent.

$$M(T) = \begin{bmatrix} A_1 \\ \vdots \\ A_n \end{bmatrix}$$

$$A_1 = M(T|G(T, X_1))$$

$$CRL.$$
Block Dingued.
$$Size = din(G(T, X_1))$$

(8.19). V is a complex vertor spare. To L(U) is a complex vertor spare. To L(U)

$$M(7) = \begin{pmatrix} \frac{\overline{A_1}}{\overline{A_2}} \\ \frac{\overline{A_2}}{\overline{A_m}} \end{pmatrix}$$

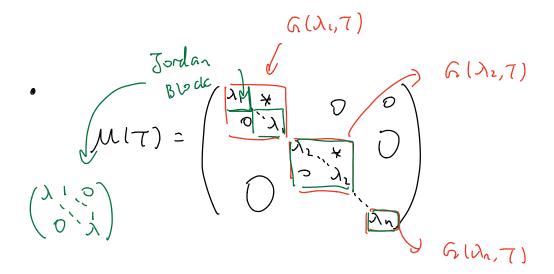
A; =
$$\begin{pmatrix} \lambda_1 & * \\ 0 & \lambda_2 \end{pmatrix}$$
 dix d: $\begin{cases} d_1 = d_1 \text{ in } G(T, \lambda_1) \\ \text{is called multiplizity} \end{cases}$

:
$$(\tau - \lambda; 1)$$
 as nilpotent.

$$M(T|_{G(T,\lambda:)})-M(\lambda:1)$$

$$\mu(\tau|_{\kappa(\tau,\lambda_i)}) = \begin{pmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{pmatrix}$$

$$= \begin{pmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{pmatrix}$$



Jordan normal form (8.59, 8.60) v is a vertor spane over C. TELLU! 3 A BASIS OF U. SMU TOOT

where $T:=\begin{pmatrix} \lambda \downarrow & 0 \\ 0 & \lambda \end{pmatrix}$ 2 Jordan Bude.

((8.55)) IP NELLU) is nilpotent. 2 a basis of V, such that

$$\left(M(N) = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix} \right)$$

$$\left(A \in \{0 \text{ so } 1\} \right)$$

(8.55) NELLU) is nilpotent. $\exists v_1, \dots, v_n \in V$ la m, m, m, m, m, so such that

a $\{ v_1, Nv_1, N^2v_1, \dots, N^m_n v_1, \dots, N^m_n v_n \}$ is a basis $\cdot \{ V :$

b) Nm,+1 U, =0, - ... Nm,+1 Un = 0

 $\underbrace{\mathcal{C}_{\mathsf{X}}}_{\mathsf{N}} \qquad \mathcal{N} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{pmatrix} \qquad \vdots \qquad \mathcal{C}_{\mathsf{N}} \longrightarrow \mathcal{C}_{\mathsf{N}}^{\mathsf{N}}.$

 $U_1 = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$

 $\mathcal{N}_{0} \cup_{1} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 0 \\ 2 \\ 0 \end{pmatrix}$

 $N^{2}U_{1} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} 0 \\ 2 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ 0 \\ 0 \end{pmatrix}$ $M_{1} = 2$

 $\mathcal{J}_{0} = \begin{pmatrix} 0 & 1 & 3 \\ 0 & 0 & 2 \\ 0 & 0 & 3 \end{pmatrix} \begin{pmatrix} 2 \\ 0 \\ 0 \end{pmatrix} = \begin{pmatrix} 0 \\ 0$

$$\begin{array}{llll} & \mathcal{N}^{2} U_{1}, & \mathcal{N}^{2} U_{1}, & U_{1} & = \\ & \mathcal{N}^{2} U_{1}, & \mathcal{N}^{2} U_{1}, & U_{2} & = \\ & \mathcal{N}^{2} U_{1}, & \mathcal{N}^{2} U_{2} & = \\ & \mathcal{N}^{2} U_{1} & = & \mathcal{N}^{2} U_{1} & = & \\ & \mathcal{N}^{2} U_{1} & = & \mathcal{N}^{2} U_{1} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{1} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} & = & \\ & \mathcal{N}^{2} U_{2} & = & \mathcal{N}^{2} U_{2} &$$

$$M(N)^{2}\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix}$$

$$U_{1} = \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

$$U_{2} = \begin{pmatrix} 0 \\ 0 \\ \frac{1}{0} \\ -\frac{1}{0} \\ 0 \\ 0 \end{pmatrix}$$

$$U_{3} = \begin{pmatrix} 0 \\ 0 \\ \frac{0}{0} \\ \frac{1}{0} \\ 0 \\ 1 \end{pmatrix}$$

$$U_{3} = \begin{pmatrix} 0 \\ 0 \\ \frac{0}{0} \\ 0 \\ 1 \end{pmatrix}$$

$$U_{3} = \begin{pmatrix} 0 \\ 0 \\ \frac{0}{0} \\ 0 \\ 1 \end{pmatrix}$$

M' = 5

$$\Delta^{r} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \qquad \forall \Omega^{r} = \Omega \cdot \Omega^{r} = \Omega \qquad \text{with} \qquad \omega^{r} = 0$$

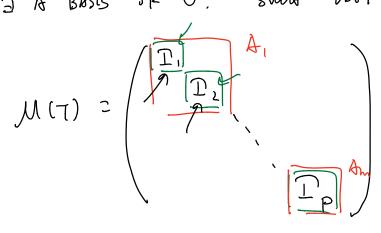
$$V_3 = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} \qquad N_3 = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} \qquad \qquad N_3 = 1.$$

$$N(N(U_1)) = N^2U_1$$
, $N(U_1) = N(U_1)$
 $N(N(U_1)) = N^2U_3$, $N(U_3) = N(U_3)$
 $N(U_3) = N^2U_3 = 0$ $N(U_3) = N(U_3)$

Jordan normal form (8.59, 8.60).

V is a versor spane over C. TEXLU).

3 A BASIS OF U. SMA TABIT



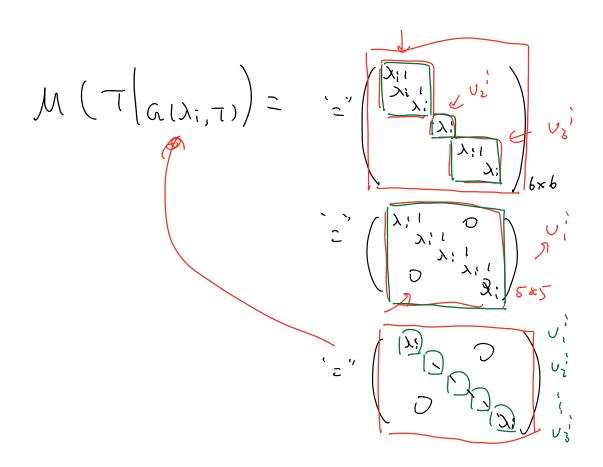
where $T:=\begin{pmatrix} \lambda \downarrow 0 \\ 0 & \lambda \end{pmatrix}$ is an eigenvalue. θ Jordan Bude.

Pf. $V = G(\lambda_1, T) \oplus G(\lambda_2, T) \oplus \cdots \oplus G(\lambda_m, T)$ where $\lambda_1, \dots, \lambda_m$ are distinct eigenvalues.

We know

 $(\tau-\lambda;1)$ G($\lambda;,\tau$) is nilpotent.

$$M(T|_{G(\lambda_i,T)}) - \lambda_i(',) =$$



•