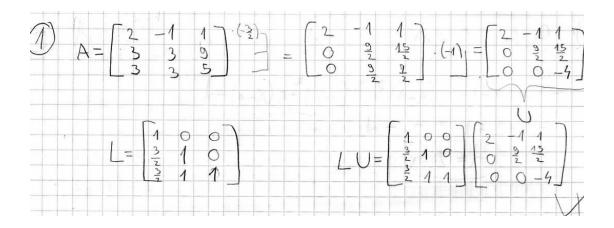
ZADACI ZA NUMERIČKU KOLOKVIJ 1!

1. Bez pivotiranja nađite LU faktorizaciju matrice

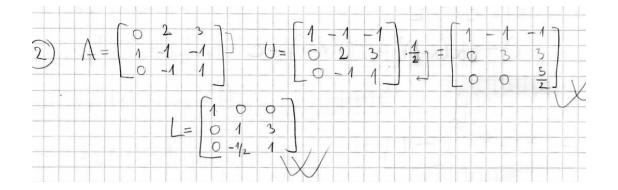
$$A = \begin{bmatrix} 2 & -1 & 1 \\ 3 & 3 & 9 \\ 3 & 3 & 5 \end{bmatrix}.$$



2. Odredite LUfaktorizaciju matrice

$$A = egin{bmatrix} 0 & 2 & 3 \\ 1 & 1 & -1 \\ 0 & -1 & 1 \end{bmatrix}$$
 . Rješenje:

$$LU = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & -1/2 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 & -1 \\ 0 & 2 & 3 \\ 0 & 0 & 5/2 \end{bmatrix}.$$



3. Odredite potpuni kubični splajn za podatke

\boldsymbol{x}	0	1	2
y	0	1	2

uz dodatne uvjete s'(0) = s'(2) = 1.

3)		× 0 1 2 9 0 1 2
	$S_1(0) = 0 \rightarrow d_1=0$	5/(x)=0x3+(x2+cx+
	$S_1(1) = 1 \longrightarrow \alpha_1 + \beta_1 + \beta_1 = 1 \Rightarrow \alpha_1 + \beta_2 = 0$ $S_1(0) = 1 \longrightarrow C_1 = 1$	3'(x)=6ax+26
		+26+6
	$S'_{1}(1) = S'_{2}(1) \rightarrow 3\alpha_{1} + 2b_{1} + c_{1} = 3\alpha_{2}$ $S''_{1}(1) = S''_{2}(1) \rightarrow 6\alpha_{1} + 2b_{1} + 6\alpha_{2} + 2b_{2}$ $\begin{bmatrix} 1, 2 \end{bmatrix}$	27-27-0 ₂
	$S_2(1)=1 \rightarrow \alpha_2+\beta_2+\beta_2+\beta_2=1 \Rightarrow$	
	5.(2)=2 -> 80,+46,+20,+d2=2	
	$S_2(2)=1 \rightarrow 12a_2+1_1b_2+C_2=1$	
	51 (1) = 52 (1) -> 60,+26,=60,+	2 C-,

$$a_1+b_1=0 \Rightarrow b_1=-a_1$$

 $a_1+1=b_1+1=b_2+2b_2+c_2 \Rightarrow 3a_1-2a_1+1=b_1a_2+2b_2$
 $a_2+b_2+c_2+d_2=1 \Rightarrow a_1+1=3a_2+2b_2+c_2$
 $a_1+1=3a_2+2b_2+c_2$
 $a_1+1=3a_2+2b_2+c_2$
 $a_1+1=3a_2+2b_2+c_2$
 $a_1+1=3a_2+2b_2+c_2$
 $a_1+b_1=3a_2+b_2+c_2$
 $a_1+b_2=3a_2+b_2$
 $a_1+b_2=3a_2+b_2$
 $a_1+b_2=3a_2+b_2$

$$3a_{2}+b_{2}+2=6a_{1}+2b_{2}+C_{2}$$
 $3a_{2}+b_{2}+C_{2}=2=7$
 $b_{1}=2-3a_{2}-C_{2}$
 $a_{2}+b_{2}+C_{2}+d_{2}=1$
 $8a_{2}+4b_{2}+2c_{2}+d_{2}=2$
 $12a_{2}+4b_{2}+C_{2}=1$
 $a_{2}+2-3a_{2}-c_{2}+c_{2}+d_{2}=1$
 $8a_{2}+8-12a_{2}-6c_{2}+2c_{2}+d_{2}=2$
 $12a_{2}+6c_{2}+6c_{2}+6c_{2}=1$

Još do kraja riješit ovih 6 jednadzbi sa 6

nepoznanica

4. Odredite vrijednosti a,b,c,d tako da funkcija

$$s(x) = \begin{cases} -x^3 + 2x + 1, & 0 \le x \le 1\\ a(x-1)^3 + b(x-1)^2 + c(x-1) + d, & 1 \le x \le 2 \end{cases}$$

bude prirodni kubični splajn.

Rješenje: a = 1, b = -3, c = -1, d = 2.

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$$S_{1}(1) = S_{2}(1)$$

 $-X^{3}+2X+1 = \alpha(X-1)^{3}+ \xi_{1}(X-1)^{2}+c(X-1)+d$
 $-1+2+1=0+d$
 $d=2$
 $S_{1}(X) = -3X^{2}+2$
 $S_{2}(X) = 3\alpha(X-1)^{2}+2\xi(X-1)+c$
 $S_{1}(X) = -6X$
 $S_{1}(X) = -6X$
 $S_{1}(X) = 6X$
 $S_{1}(X) = 6X$