$$\left.\begin{aligned} x_1 &= g_1(x_1, \dots, x_m) \\ &\vdots \\ x_m &= g_m(x_1, \dots, x_m) \end{aligned}\right\}$$

- Ako je g diferencijabilna u $S(x_0, r)$:

* slučaj $m=1$: $x, y \in S(x_0, r)$

$$g(x) - g(y) = g'(\xi)(x-y)$$

$$|g(x) - g(y)| = |g'(\xi)| \cdot |x-y|$$

$$\le \underbrace{\max_{x \in [x_0 - r, x_0 + r]} |g'(x)|}\cdot |x-y|$$

$$\boxed{\underline{q} = \max_{x \in S(x_0, r)} |g'(x)|}$$ koef. kontr.

* slučaj $m>1$: $x, Y \in S(x_0, r)$ (m-dimenzioni vektori)

$$g_i(x) - g_i(Y) = \sum_{j=1}^{m} \frac{\partial g_i(\xi_i)}{\partial x_j}(x_j - y_j), \quad \xi_i \in S(x_0, r), \; i = 1, \dots, m$$

$$|g_i(x) - g_i(Y)| \le \sum_{j=1}^{m} \left| \frac{\partial g_i(\xi_i)}{\partial x_j} \right| \cdot |x_j - y_j|$$

$$\|g(x) - g(Y)\|_\infty = \max_{1 \le i \le m} |g_i(x) - g_i(Y)|$$

$$= \max_{1 \le i \le m} \left| \sum_{j=1}^{m} \frac{\partial g_i(\xi_i)}{\partial x_j}(x_j - y_j) \right|$$

$$\le \max_{1 \le i \le m} \sum_{j=1}^{m} \left| \frac{\partial g_i(\xi_i)}{\partial x_j} \right| \cdot |x_j - y_j|$$

$$\le \underbrace{\max_{1 \le j \le m} |x_j - y_j|} \cdot \max_{1 \le i \le m} \sum_{j=1}^{m} \left| \frac{\partial g_i(\xi_i)}{\partial x_j} \right|$$

$$= \|X - Y\|_\infty \cdot \max_{1 \le i \le m} \sum_{j=1}^{m} \left| \frac{\partial g_i(\xi_i)}{\partial x_j} \right|$$

$$= \|X - Y\|_\infty \cdot \underbrace{\max_{z \in S(x_0, r)} \|J(z)\|_\infty}$$

$$\boxed{\underline{q} = \max_{z \in S(x_0, r)} \|J(z)\|_\infty}$$

$$J(x) = \begin{pmatrix} \frac{\partial g_1(x)}{\partial x_1} & \cdots & \frac{\partial g_1(x)}{\partial x_m} \\ \vdots & & \\ \frac{\partial g_m(x)}{\partial x_1} & \cdots & \frac{\partial g_m(x)}{\partial x_m} \end{pmatrix}$$