$$c = \frac{a+b}{2} \tag{1a}$$

Ako je $f(a)f(c) < 0:$ $\quad a = a, b = c$ (1b)

Ako je $f(c)f(b) < 0:$ $\quad a = c, b = b$ (1c)

Ako je $f(a)f(c) = 0:$ $\quad$ dobiva se rješenje $\xi = c$ (1d)

$$|b-a| \leq \varepsilon_1 \qquad \text{i/ili} \qquad |f(x_i)| \leq \varepsilon_2 \tag{2}$$

$$x_i = b - \frac{b-a}{f(b)-f(a)} f(b) \tag{3a}$$

Ako je $f(a)f(x_i) < 0:$ $\quad a = a, b = x_i$ (3b)

Ako je $f(x_i)f(b) < 0:$ $\quad a = x_i, b = b$ (3c)

Ako je $f(a)f(x_i) = 0:$ $\quad$ dobiva se rješenje $\xi = x_i$ (3d)

$$|b-a| \leq \varepsilon_1 \qquad \text{i/ili} \qquad |f(x_i)| \leq \varepsilon_2 \tag{4}$$

$$x_{i+1} = g(x_i) \tag{5}$$

$$|x_{i+1} - x_i| \leq \varepsilon_1 \qquad \text{i/ili} \qquad |f(x_{i+1})| \leq \varepsilon_2 \tag{6}$$

$$\left|\frac{e_{i+1}}{e_i}\right| = |g'(\zeta)| < 1 \tag{7}$$

$$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)} \tag{8}$$

$$|x_{i=1} - x_i| \leq \varepsilon_1 \qquad \text{i/ili} \qquad |f(x_{i+1})| \leq \varepsilon_2 \tag{9}$$

$$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_0)} \tag{10}$$

$$x_{i+1} = x_i - \frac{x_i - x_{i-1}}{f(x_i) - f(x_{i-1})} f(x_i) \tag{11}$$

$$\mathbf{Ax} = \mathbf{b} \tag{12}$$

$$\sum_{j=1}^{n} a_{ij} x_j = b_i \qquad (i = 1, 2, \ldots, n) \tag{13}$$

$$[\mathbf{A}|\mathbf{I}] \rightarrow [\mathbf{I}|\mathbf{A}^{-1}] \tag{14}$$

$$\mathbf{x}=\mathbf{A}^{-1}\mathbf{b} \tag{15}$$

$$\mathbf{A}=\mathbf{LU} \tag{16}$$

$$\mathbf{Lb'} = \mathbf{b} \Rightarrow \mathbf{b'} \tag{17}$$

$$\mathbf{Ux} = \mathbf{b'} \Rightarrow \mathbf{x} \tag{18}$$

$$x_i^{(k+1)} = x_i^{(k)} + \frac{1}{a_{ii}}\left(b_i - \sum_{j=1}^{n} a_{ij}x_j^{(k)}\right) \qquad (i = 1, 2, \ldots, n) \tag{19}$$

$$x_i^{(k+1)} = x_i^{(k)} + \frac{R_i^{(k)}}{a_{ii}} \qquad (i = 1, 2, \ldots, n) \tag{20}$$

$$R_i^{(k)} = b_i - \sum_{j=1}^{n} a_{ij}x_j^{(k)} \qquad (i = 1, 2, \ldots, n) \tag{21}$$

$$x_i^{(k+1)} = x_i^{(k)} + \frac{R_i^{(k)}}{a_{ii}} \qquad (i = 1, 2, \ldots, n) \tag{22}$$

$$R_i^{(k)} = b_i - \sum_{j=1}^{i-1} a_{ij}x_j^{(k+1)} - \sum_{j=i}^{n} a_{ij}x_j^{(k)} \qquad (i = 1, 2, \ldots, n) \tag{23}$$

$$x_i^{(k+1)} = x_i^{(k)} + \omega\frac{R_i^{(k)}}{a_{ii}} \qquad (i = 1, 2, \ldots, n) \tag{24}$$

$$R_i^{(k)} = b_i - \sum_{j=1}^{i-1} a_{ij}x_j^{(k+1)} - \sum_{j=i}^{n} a_{ij}x_j^{(k)} \qquad (i = 1, 2, \ldots, n) \tag{25}$$

$$P_n(x) = a_0 + a_1x + a_2x^2 + \ldots + a_nx^n \tag{26}$$

$$\begin{aligned} y_0 &= a_0 + a_1x_0 + a_2x_0^2 + \ldots + a_nx_0^n \\ y_1 &= a_0 + a_1x_1 + a_2x_1^2 + \ldots + a_nx_1^n \\ y_2 &= a_0 + a_1x_2 + a_2x_2^2 + \ldots + a_nx_2^n \\ &\ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ y_n &= a_0 + a_1x_n + a_2x_n^2 + \ldots + a_nx_n^n \end{aligned} \tag{27}$$

$$P_n(x) = \sum_{k=0}^{n} L_k(x)f(x_k) \tag{28}$$

$$L_k(x) = \frac{(x-x_0)\dots(x-x_{k-1})(x-x_{k+1})\dots(x-x_n)}{(x_k-x_0)\dots(x_k-x_{k-1})(x_k-x_{k+1})\dots(x_k-x_n)} = \prod_{\substack{i=0\\ i\neq k}}^{n} \frac{x-x_i}{x_k-x_i} \qquad (k=0,1,\dots,n) \tag{29}$$

$$P_n(x) = f_0 + \binom{s}{1}\Delta f_0 + \binom{s}{2}\Delta^2 f_0 + \dots + \binom{s}{n}\Delta^n f_0 \tag{30}$$

$$s = \frac{x-x_0}{h} \qquad \text{pa je} \qquad x = x_0 + sh \tag{31}$$

$$h = x_i - x_{i-1} \tag{32}$$

$$\begin{aligned} &\Delta f_0 = f_1 - f_0 \\ &\Delta^2 f_0 = \Delta f_1 - \Delta f_0 = f_2 - 2f_1 + f_0 \\ &\dots\dots \\ &\Delta^n f_0 = \Delta^{n-1} f_1 - \Delta^{n-1} f_0 = \sum_{i=0}^{n} (-1)^i \binom{n}{i} f_i \end{aligned} \tag{33}$$

$$P_n(x) = f_0 + \binom{s^+}{1}\Delta f_0 + \binom{s^+}{2}\Delta^2 f_0 + \dots + \binom{s^+}{n}\Delta^n f_0 \tag{34}$$

$$\binom{s^+}{i} = \frac{s(s+1)(s+2)\cdots(s+[i-1])}{i!} \tag{35}$$

$$y = a_0 + a_1 x + a_2 x^2 + \dots + a_n x^n \tag{36}$$

$$\frac{\partial S}{\partial a_k} = \sum_{i=1}^{N} 2(Y_i - a_0 - a_1 x_i - \dots - a_n x_i^n)(-x_i^k) = 0 \qquad (k=0,1,\dots,n) \tag{37}$$

$$\begin{aligned} &a_0 N + a_1 \sum_{i=1}^{N} x_i + \dots + a_n \sum_{i=1}^{N} x_i^n = \sum_{i=1}^{N} Y_i \\ &\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \\ &a_0 \sum_{i=1}^{N} x_i^n + a_1 \sum_{i=1}^{N} x_i^{n+1} + \dots + a_n \sum_{i=1}^{N} x_i^{2n} = \sum_{i=1}^{N} x_i^n Y_i \end{aligned} \tag{38}$$

$$y = ax^b \tag{39}$$

$$\ln(y) = \ln a + b\ln(x) \tag{40}$$

$$Y = \ln(y) \qquad A = \ln(a) \qquad X = \ln(x) \qquad iB = b \tag{41}$$

$$Y = A + Bx \tag{42}$$

$$y = ae^{bx} \tag{43}$$

$$\ln(y) = \ln a + bx \Rightarrow Y = A + bx \tag{44}$$

$$P_n(x) = a_0 + a_1 x + a_2 x^2 + \ldots + a_n x^n \tag{45}$$

$$f'(x) \cong P'(x) = a_1 + 2a_2 x + 3a_3 x^2 + \ldots + n a_n x^{n-1} \tag{46}$$

$$f''(x) \cong P''(x) = 2a_2 + 6a_3 x + \ldots + n(n-1) a_n x^{n-2} \tag{47}$$

$$f'(x_i) \approx \frac{f(x_i + h) - f(x_i)}{h} \tag{48}$$

$$f'(x_i) \approx \frac{f(x_i) - f(x_i - h)}{h} \tag{49}$$

$$f'(x_i) \approx \frac{f(x_i + h) - f(x_i - h)}{2h} \tag{50}$$

$$f(x) \approx P_n(x) = a_0 + a_1 x + a_2 x^2 + \ldots \tag{51}$$

$$I = \int_a^b f(x)dx \approx \int_a^b P_n(x)dx = \left(a_0 x + a_1 \frac{x^2}{2} + \ldots \right)\Bigg|_a^b \tag{52}$$

$$I = \int_a^b f(x)dx \approx \frac{b-a}{n} \left[\frac{1}{2}(f_0 + f_n) + \sum_{j=1}^{n-1} f_j \right] \tag{53}$$

$$I = \int_a^b f(x)dx \approx \frac{b-a}{6n} \left[f_0 + f_{2n} + 4\sum_{j=0}^{n-1} f_{2j+1} + 2\sum_{j=1}^{n-1} f_{2j} \right] \tag{54}$$

$$\begin{aligned} I &= \int_a^b f(x)dx = \int_{-1}^1 f(mt + c)m\, dt = \frac{b-a}{2} \int_{-1}^1 F[t]dt \\ &= \frac{b-a}{2} \left(F\left(-\frac{1}{\sqrt{3}} \right) + F\left(\frac{1}{\sqrt{3}} \right) \right) \end{aligned} \tag{55}$$

$$m = \frac{b-a}{2} \qquad \text{i} \qquad c = \frac{b+a}{2} \tag{56}$$

$$y(t) = y(t_0) + y'(t_0)\Delta t + \frac{y''(t_0)}{2}(\Delta t)^2 + \ldots + \frac{y^{(n)}(t_0)}{n!}(\Delta t)^n + \ldots \tag{57}$$

$$y'' = \frac{\partial y'}{\partial t} + \frac{\partial y'}{\partial y}\frac{dy}{dt} = y'_t + y'_y y' \tag{58}$$

$$y''' = y'_{tt} + 2y'_{ty} y' + y'_t y'_y + (y'_y)^2 y' + y'_{yy}(y')^2 \tag{59}$$

$$y_{n+1} = y_n + h\, f(t_n, y_n) \tag{60}$$

$$y_{n+1} = y_n + h\,f(t_{n+1}, y_{n+1}) \tag{61}$$

$$y_{n+1} = y_n + \frac{1}{2}\Delta y_1 + \frac{1}{2}\Delta y_2 = y_n + \frac{h}{2}(f_n + f_{n+1}) \tag{62a}$$

$$\Delta y_1 = hf(t_n, y_n) = hf_n \tag{62b}$$

$$\Delta y_2 = hf\,(t_n + \Delta t, y_n + \Delta y_1) = hf_{n+1} \tag{62c}$$

$$y_{n+1} = y_n + 0 \cdot \Delta y_1 + 1 \cdot \Delta y_2 = y_n + hf_{n+1/2} \tag{63a}$$

$$\Delta y_1 = hf(t_n, y_n) = hf_n \tag{63b}$$

$$\Delta y_2 = hf\left(t_n + \frac{h}{2}, y_n + \frac{\Delta y_1}{2}\right) = hf_{n+1/2} \tag{63c}$$

$$y_{n+1} = y_n + \frac{1}{6}(\Delta y_1 + 2\Delta y_2 + 2\Delta y_3 + \Delta y_4) \tag{64}$$

$$\Delta y_1 = hf(t_n, y_n) \tag{65a}$$

$$\Delta y_2 = hf\left(t_n + \frac{h}{2}, y_n + \frac{\Delta y_1}{2}\right) \tag{65b}$$

$$\Delta y_3 = hf\left(t_n + \frac{h}{2}, y_n + \frac{\Delta y_2}{2}\right) \tag{65c}$$

$$\Delta y_4 = hf(t_n + h, y_n + \Delta y_3) \tag{65d}$$