Algoritmus(de Casteljau, pro trojúhelníkové Bezierovy segmenty)
Vstup Bezierovy body $\mathbf{b}_{i,j,k}$,$i, j, k \geq 0, i + j + k = n$, parametrická hodnota (u*,v*).
Výstup: Bod křivky **b**(u*,v*)
Postup:
Begin
FOR i:=0 TO n DO $\mathbf{b}_i^0$:=$\mathbf{b}_i$;
FOR j:=1 TO n-i DO
Begin
k:=n-i-j;
$\mathbf{b}_{i,j,k}^0$:=$\mathbf{b}_{i,j,k}$
END;
FOR l:=1 TO n DO
FOR i:=1 TO n-l DO
FOR j:=1 TO n-l-i DO
Begin
k:=n-l-i-j;
$\mathbf{b}_{i,j,k}^l$:= u*$\mathbf{b}_{i+1,j,k}^{l-1}$ + v*$\mathbf{b}_{i,j+1,k}^{l-1}$ +(1-u*-v*)$\mathbf{b}_{i,j,k+1}^{l-1}$
END
b(u*,v*):= $\mathbf{b}_n^{0,0,0}$
END.
Pro pomocné body $\mathbf{b}_{i,j,k}^l$ platí: $\mathbf{b}_{i,j,k}^l$ =

$$\sum_{i^*+j^*+k^*=l} \mathbf{b}_{i+i^*,j+j^*,k+k^*}^0 B_{i^*,j^*,k^*}^l(u^*, v^*, 1 - u^* - v^*)$$

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Důkaz indukcí vzhledem k l.
1. l = 0: $\mathbf{b}_{i,j,k}^0$=$\mathbf{b}_{i,j,k}^0$ $\frac{0!}{0!0!0!}(u^*)^0(v^*)^0(1 - u^* - v^*)^0 = \mathbf{b}_{i,j,k}^0 B_{0,0,0}^0(u^*, v^*, 1 - u^* - v^*)$.
$i^* + j^* + k^* = 0$
2. předpokládejme, že vzorec platí pro (l-1)
platí:

$$\mathbf{b}_{i,j,k}^{l-1} = \sum_{i^*+j^*+k^*=l-1} \mathbf{b}_{i+i^*,j+j^*,k+k^*}^0 B_{i^*,j^*,k^*}^{l-1}(u^*, v^*, 1 - u^* - v^*).$$

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\begin{aligned}
\mathbf{b}^{l}_{i,j,k} &= u^{*}\mathbf{b}^{l-1}_{i+1,j,k} + v^{*}\mathbf{b}^{l-1}_{i,j+1,k} + (1-u^{*}-v^{*})\mathbf{b}^{l-1}_{i,j,k+1} = \\
&= u^{*}\Big(\sum_{i^{*}+j^{*}+k^{*}=l-1} \mathbf{b}^{0}_{i+1+i^{*},j+j^{*},k+k^{*}} B^{l-1}_{i^{*},j^{*},k^{*}}(u^{*},v^{*},1-u^{*}-v^{*}) \\
&\quad v^{*}\Big(\sum_{i^{*}+j^{*}+k^{*}=l-1} \mathbf{b}^{0}_{i+i^{*},j+1+j^{*},k+k^{*}} B^{l-1}_{i^{*},j^{*},k^{*}}(u^{*},v^{*},1-u^{*}-v^{*}) + \\
&\quad + (1-u^{*}-v^{*})\Big(\sum_{i^{*}+j^{*}+k^{*}=l-1} \mathbf{b}^{0}_{i+i^{*},j+j^{*},k+1+k^{*}} B^{l-1}_{i^{*},j^{*},k^{*}}(u^{*},v^{*},1-u^{*}-v^{*}) = \\
&= \sum_{i'+j'+k'=l} u^{*}\mathbf{b}^{0}_{i+i',j+j',k+k'} B^{l-1}_{i'-1,j',k'}(u^{*},v^{*},1-u^{*}-v^{*}) + \\
&\quad + v^{*}\mathbf{b}^{0}_{i+i',j+j',k+k'} B^{l-1}_{i',j'-1,k'}(u^{*},v^{*},1-u^{*}-v^{*}) + \\
&\quad + (1-u^{*}-v^{*})\mathbf{b}^{0}_{i+i',j+j',k+k'} B^{l-1}_{i',j',k'-1}(u^{*},v^{*},1-u^{*}-v^{*}) \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} u^{*} B^{l-1}_{i'-1,j',k'}(u^{*},v^{*},1-u^{*}-v^{*}) + \\
&\quad + v^{*} B^{l-1}_{i',j'-1,k'}(u^{*},v^{*},1-u^{*}-v^{*}) + (1-u^{*}-v^{*}) B^{l-1}_{i',j',k'-1}(u^{*},v^{*},1-u^{*}-v^{*}) \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} \Big[u^{*}\frac{(l-1)!}{(i'-1)!j'!k'!}(u^{*})^{i'-1}(v^{*})^{j'}(1-u^{*}-v^{*})^{k'} + \\
&\quad + v^{*}\frac{(l-1)!}{i'!(j'-1)!k'!}(u^{*})^{i'}(v^{*})^{j'-1}(1-u^{*}-v^{*})^{k'} + \\
&\quad + (1-u^{*}-v^{*})\frac{(l-1)!}{i'!j'!(k'-1)!}(u^{*})^{i'}(v^{*})^{j'}(1-u^{*}-v^{*})^{k'-1} \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} (u^{*})^{i'}(v^{*})^{j'}(1-u^{*}-v^{*})^{k'} \left[\frac{(l-1)!}{(i'-1)!j'!k'!} + \frac{(l-1)!}{i'!(j'-1)!k'!} + \frac{(l-1)!}{i'!j'!(k'-\cdots}\right. \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} (u^{*})^{i'}(v^{*})^{j'}(1-u^{*}-v^{*})^{k'} \frac{(l-1)!}{(i'-1)!(j'-1)!(k'-1)!}\left[\frac{1}{j'k'} + \frac{1}{i'k'} + \frac{1}{i'j'}\cdots\right. \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} (u^{*})^{i'}(v^{*})^{j'}(1-u^{*}-v^{*})^{k'} \frac{(l-1)!}{(i'-1)!(j'-1)!(k'-1)!}\frac{i'+j'+k'}{i'j'k'} \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} (u^{*})^{i'}(v^{*})^{j'}(1-u^{*}-v^{*})^{k'} \frac{l!}{i'!j'!k'!} \\
&= \sum_{i'+j'+k'=l} \mathbf{b}^{0}_{i+i',j+j',k+k'} B^{l}_{i',j',k'}(u^{*},v^{*},1-u^{*}-v^{*})
\end{aligned}
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