令 $U=\{u_0=0,\ u_1=0,\ u_2=0,\ u_3=1,\ u_4=1,\ u_5=1\}$

p=3. 计算 B样条基函数

$N_{0,0}=N_{1,0}=0$

$N_{2,0}=\begin{cases}1 & 0\le u<1\\ 0 & \text{otherwise.}\end{cases}$

$N_{3,0}=N_{4,0}=0$

$N_{0,1}=0$

$N_{1,1}=\frac{u_3-u}{u_3-u_2}\cdot N_{2,0}$

$=\frac{1-u}{1}=\begin{cases}1-u & 0\le u<1\\ 0 & \text{otherwise.}\end{cases}$

$N_{2,1}=\frac{u-u_2}{u_3-u_2}N_{2,0}$

$=\begin{cases}u & 0\le u\le 1\\ 0 & \text{otherwise.}\end{cases}$

$N_{3,1}=0$

$N_{0,2}=\frac{u-u_0}{u_2-u_0}N_{2,1}+\frac{u_3-u}{u_3-u_1}N_{1,1}=\begin{cases}(1-u)^2 & 0\le u<1\\ 0 & \text{otherwise.}\end{cases}$

$N_{1,2}=\frac{u-0}{1-0}\cdot N_{1,1}+\frac{1-u}{1-0}N_{2,1}=\begin{cases}2u(1-u) & 0\le u<1\\ 0 & \text{otherwise}\end{cases}$

$N_{2,2}=\frac{u-0}{1-0}N_{2,1}+\frac{1-u}{1-1}N_{3,1}=\begin{cases}u^2 & 0\le u<1\\ 0 & \text{otherwise}\end{cases}$

$N_{0,3}=\frac{u-u_0}{u_3-u_0}N_{0,2}+\frac{u_4-u}{u_4-u_1}N_{1,2}$

$=u\cdot N_{0,2}+(1-u)\cdot N_{1,2}$

$=\begin{cases}3u(1-u)^2 & 0\le u<1\\ 0 & \text{otherwise,}\end{cases}$

$N_{1,3}=\frac{u-u_1}{u_4-u_1}N_{1,2}+\frac{u_5-u}{u_5-u_2}N_{2,2}$

$=uN_{1,2}+1-uN_{2,2}$

$=\begin{cases}3u^2(1-u) & 0\le u<1\\ 0 & \text{otherwise.}\end{cases}$