```
def Lie_Group():
    Print_Function()
    coords = symbols('t x y z',real=True)
    (st4d,g0,g1,g2,g3) = Ga.build('gamma*t|x|y|z',g=[1,-1,-1,-1],coords=coords)
    I = st4d.i
    a = st4d.mv('a','vector')
    B = st4d.mv('B','bivector')
    print 'a =',a
    print 'B =',B
    print 'a|B =', a|B
    print ((a|B)|B).simplify().Fmt(3,'(a|B)|B')
    print (((a|B)|B)|B).simplify().Fmt(3,'((a|B)|B)|B')
    return
```

Code Output:

$$a = a^t \gamma_t + a^x \gamma_x + a^y \gamma_y + a^z \gamma_z$$

$$B = B^{tx} \gamma_t \wedge \gamma_x + B^{ty} \gamma_t \wedge \gamma_y + B^{tz} \gamma_t \wedge \gamma_z + B^{xy} \gamma_x \wedge \gamma_y + B^{xz} \gamma_x \wedge \gamma_z + B^{yz} \gamma_y \wedge \gamma_z$$

$$a \cdot B = \left(B^{tx} a^x + B^{ty} a^y + B^{tz} a^z\right) \gamma_t + \left(B^{tx} a^t + B^{xy} a^y + B^{xz} a^z\right) \gamma_x + \left(B^{ty} a^t - B^{xy} a^x + B^{yz} a^z\right) \gamma_y + \left(B^{tz} a^t - B^{xz} a^x - B^{yz} a^y\right) \gamma_z$$

$$\begin{aligned}(a \cdot B) \cdot B = &\left(\left(B^{tx}\right)^2 a^t + B^{tx} B^{xy} a^y + B^{tx} B^{xz} a^z + \left(B^{ty}\right)^2 a^t - B^{ty} B^{xy} a^x + B^{ty} B^{yz} a^z + \left(B^{tz}\right)^2 a^t - B^{tz} B^{xz} a^x - B^{tz} B^{yz} a^y\right) \gamma_t \\ &+ \left(\left(B^{tx}\right)^2 a^x + B^{tx} B^{ty} a^y + B^{tx} B^{tz} a^z + B^{ty} B^{xy} a^t + B^{tz} B^{xz} a^t - (B^{xy})^2 a^x + B^{xy} B^{yz} a^z - (B^{xz})^2 a^x - B^{xz} B^{yz} a^y\right) \gamma_x \\ &+ \left(B^{tx} B^{ty} a^x - B^{tx} B^{xy} a^t + \left(B^{ty}\right)^2 a^y + B^{ty} B^{tz} a^z + B^{tz} B^{yz} a^t - (B^{xy})^2 a^y - B^{xy} B^{xz} a^z - B^{xz} B^{yz} a^x - (B^{yz})^2 a^y\right) \gamma_y \\ &+ \left(B^{tx} B^{tz} a^x - B^{tx} B^{xz} a^t + B^{ty} B^{tz} a^y - B^{ty} B^{yz} a^t + \left(B^{tz}\right)^2 a^z - B^{xy} B^{xz} a^y + B^{xy} B^{yz} a^x - (B^{xz})^2 a^z - (B^{yz})^2 a^z\right) \gamma_z\end{aligned}$$

$$\begin{aligned}((a \cdot B) \cdot B) \cdot B = &\left(\left(B^{tx}\right)^3 a^x + \left(B^{tx}\right)^2 B^{ty} a^y + \left(B^{tx}\right)^2 B^{tz} a^z + B^{tx} \left(B^{ty}\right)^2 a^x + B^{tx} \left(B^{tz}\right)^2 a^x - B^{tx} (B^{xy})^2 a^x + B^{tx} B^{xy} B^{yz} a^z - B^{tx} (B^{xz})^2 a^x - B^{tx} B^{xz} B^{yz} a^y + \left(B^{ty}\right)^3 a^y + \left(B^{ty}\right)^2 B^{tz} a^z + B^{ty} \left(B^{tz}\right)^2 a^y - B^{ty} (B^{xy})^2 a^y - \right. \\ &+ \left(\left(B^{tx}\right)^3 a^t + \left(B^{tx}\right)^2 B^{xy} a^y + \left(B^{tx}\right)^2 B^{xz} a^z + B^{tx} \left(B^{ty}\right)^2 a^t + B^{tx} B^{ty} B^{yz} a^z + B^{tx} \left(B^{tz}\right)^2 a^t - B^{tx} B^{tz} B^{yz} a^y - B^{tx} (B^{xy})^2 a^t - B^{tx} (B^{xz})^2 a^t + \left(B^{ty}\right)^2 B^{xy} a^y + B^{ty} B^{tz} B^{xy} a^z + B^{ty} B^{tz} B^{xz} a^y - B^{ty} B^{xz} B^{y} \right. \\ &+ \left(\left(B^{tx}\right)^2 B^{ty} a^t - \left(B^{tx}\right)^2 B^{xy} a^x + B^{tx} B^{ty} B^{xz} a^z - B^{tx} B^{tz} B^{xy} a^z + B^{tx} B^{tz} B^{yz} a^x - B^{tx} B^{xz} B^{yz} a^t + \left(B^{ty}\right)^3 a^t - \left(B^{ty}\right)^2 B^{xy} a^x + \left(B^{ty}\right)^2 B^{yz} a^z + B^{ty} \left(B^{tz}\right)^2 a^t - B^{ty} B^{tz} B^{xz} a^x - B^{ty} (B^{xy})^2 a^t - B^{ty} (B^{yz}) \right. \\ &+ \left(\left(B^{tx}\right)^2 B^{tz} a^t - \left(B^{tx}\right)^2 B^{xz} a^x - B^{tx} B^{ty} B^{xz} a^y - B^{tx} B^{ty} B^{yz} a^x + B^{tx} B^{tz} B^{xy} a^y + B^{tx} B^{xy} B^{yz} a^t + \left(B^{ty}\right)^2 B^{tz} a^t - \left(B^{ty}\right)^2 B^{yz} a^y - B^{ty} B^{tz} B^{xy} a^x - B^{ty} B^{xy} B^{xz} a^t + \left(B^{tz}\right)^3 a^t - \left(B^{tz}\right)^2 B^{xz} a^x - \left(B^{tz}\right)^2 B\end{aligned}$$