```
So luong he truc toa do: 8
n =
    8
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)1
C =
    1 0 1 0 0 1 1 0
Quay quanh tuc nao x/y/z: z
Q =
Gia tri quay quanh truc: t1
t =
t1
T =
[\cos(t1), -\sin(t1), 0, 0]
[\sin(t1), \cos(t1), 0, 0]
[ 0,
           0, 1, 0]
      Ο,
              0, 0, 1]
[
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)0
C =
    1 0 1 0 0 1 1 0
Dich chuyen theo truc x : 12
dx =
12
Dich chuyen theo truc y : 0
dy =
    0
```

```
Dich chuyen theo truc z : 11
dz =
11
T =
[\cos(t1), -\sin(t1), 0, 12*\cos(t1)]
[\sin(t1), \cos(t1), 0, 12*\sin(t1)]
       Ο,
                 0, 1,
                             11]
       Ο,
                 0, 0,
                                 1]
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)1
C =
     1 0 1 0 0 1 1 0
Quay quanh tuc nao x/y/z: z
Q =
Gia tri quay quanh truc: t2
t =
t2
T =
[\cos(t1) \cdot \cos(t2) - \sin(t1) \cdot \sin(t2), - \cos(t1) \cdot \sin(t2) - \cos(t2) \cdot \sin(t1), 0, 12 \cdot \cos(t2)]
(t1)]
[\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1), \cos(t1)*\cos(t2) - \sin(t1)*\sin(t2), 0, 12*\sin(t2)]
(t1)]
                                                                           0, 1¥
                                    0,
[
11]
                                                                           0, 0¥
                                    0,
[
1]
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)0
C =
```

```
1 0 1 0 0 1 1 0
Dich chuyen theo truc x : 14
dx =
14
Dich chuyen theo truc y : 0
dy =
     0
Dich chuyen theo truc z: 13
dz =
13
T =
[\cos(t1) \cdot \cos(t2) - \sin(t1) \cdot \sin(t2), - \cos(t1) \cdot \sin(t2) - \cos(t2) \cdot \sin(t1), 0, 14 \cdot (\cos t2)]
(t1)*\cos(t2) - \sin(t1)*\sin(t2)) + 12*\cos(t1)]
[\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1), \cos(t1)*\cos(t2) - \sin(t1)*\sin(t2), 0, 14*(\cos t - \cos(t1))
(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + 12*\sin(t1)]
                                                                          0, 1¥
                                   0,
11 + 13
                                                                          0, 0¥
                                   0,
[
1]
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)1
C =
     1 0 1 0 1 1 1 0
Quay quanh tuc nao x/y/z: z
Q =
Z
Gia tri quay quanh truc: t3
t =
t3
```

```
T =
[\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)
*sin(t1)), - cos(t3) *(cos(t1) *sin(t2) + cos(t2) *sin(t1)) - sin(t3) *(cos(t1) *cos(t2) 

✓
\sin(t1) * \sin(t2)), 0, 14*(\cos(t1) * \cos(t2) - \sin(t1) * \sin(t2)) + 12* \cos(t1)]
[\cos(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*
*\sin(t2)), \cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2)
cos(t2)*sin(t1)), 0, 14*(cos(t1)*sin(t2) + cos(t2)*sin(t1)) + <math>12*sin(t1)]
[ K
0, 4
0, 1,
                                                       11 + 13
[ K
0, 4
0, 0,
                                                              1]
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)0
C =
                 1 0 1
                                     0
                                            1
Dich chuyen theo truc x : 15
dx =
15
Dich chuyen theo truc y : 0
dy =
     0
Dich chuyen theo truc z : 0
dz =
     0
Т =
[\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2))
*\sin(t1)), - \cos(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) - \sin(t3)*(\cos(t1)*\cos(t2) \(\mathref{\psi}\)
\sin(t1) * \sin(t2)), 0, 14 * (\cos(t1) * \cos(t2) - \sin(t1) * \sin(t2)) + 12 * \cos(t1) + 15 * (\cos t)
(t3)*(cos(t1)*cos(t2) - sin(t1)*sin(t2)) - sin(t3)*(cos(t1)*sin(t2) + cos(t2)*six
(t1)))]
```

```
[\cos(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)
*sin(t2)), cos(t3) *(cos(t1) *cos(t2) - sin(t1) *sin(t2)) - sin(t3) *(cos(t1) *sin(t2) #
\cos(t^2) \cdot \sin(t^1), 0, 14 \cdot (\cos(t^1) \cdot \sin(t^2) + \cos(t^2) \cdot \sin(t^1) + 12 \cdot \sin(t^1) + 15 \cdot (\cos(t^2) \cdot \sin(t^2))
 (t3)*(cos(t1)*sin(t2) + cos(t2)*sin(t1)) + sin(t3)*(cos(t1)*cos(t2) - sin(t1)*six
(t2)))1
[ K
0, 4
0, 1, ∠
11 + 13
[ K
0, K
0, 0, 4
1]
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)1
C =
                                                                       1
                                                                                                 0
                                                                                                                     1
                                                                                                                                                0
                                                                                                                                                                              1
                                                                                                                                                                                                        \cap
Quay quanh tuc nao x/y/z: z
Q =
Gia tri quay quanh truc: t4
t =
t4
T =
[\cos(t4)*(\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2)) 
\cos(t2) * \sin(t1))) - \sin(t4) * (\cos(t3) * (\cos(t1) * \sin(t2) + \cos(t2) * \sin(t1)) + \sin(t3) * (\cos(t3) * \cos(t3) 
 (\cos(t1) \cdot \cos(t2) - \sin(t1) \cdot \sin(t2)), -\cos(t4) \cdot (\cos(t3) \cdot (\cos(t1) \cdot \sin(t2) + \cos(t2))
*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2))) - \sin(t4)*(\cos(t3)*(\cos(t1)*
*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))), 0, 14
 (\cos(t1) \cdot \cos(t2) - \sin(t1) \cdot \sin(t2)) + 12 \cdot \cos(t1) + 15 \cdot (\cos(t3) \cdot (\cos(t1) \cdot \cos(t2) - \sin(t2))
 (t1)*\sin(t2) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))
 [\cos(t4)*(\cos(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2)) 
\sin(t1) * \sin(t2))) + \sin(t4) * (\cos(t3) * (\cos(t1) * \cos(t2) - \sin(t1) * \sin(t2)) - \sin(t3) * (\cos(t3) * \cos(t3) * \cos(t3) * (\cos(t3) * \cos(t3) * \cos(t3) * (\cos(t3) * (\cos(t3) * \cos(t3) * (\cos(t3) * (o(t3) * (o(t3)
 (\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))), \cos(t4)*(\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1))
*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))) - \sin(t4)*(\cos(t3)*(\cos(t1))
*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2))), 0, 14
 (\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + 12*\sin(t1) + 15*(\cos(t3)*(\cos(t1)*\sin(t2)) + \cos
 (t2)*\sin(t1) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2))]
```

```
[ K
0, 4
0, 1, ¥
11 + 13
[ K
0, 4
0, 0, \mathbf{k}
11
He truc so Chuyen vi cua he truc, 0/1 (0:Tinh tien, 1:Quay)0
C =
                                                                             0 1
Dich chuyen theo truc x : 17
dx =
17
Dich chuyen theo truc y : 16
dy =
16
Dich chuyen theo truc z : -18
dz =
-18
T =
[\cos(t4)*(\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2)) 
\cos(t2) * \sin(t1)) - \sin(t4) * (\cos(t3) * (\cos(t1) * \sin(t2) + \cos(t2) * \sin(t1)) + \sin(t3) 
 (\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2))), -\cos(t4)*(\cos(t3)*(\cos(t1)*\sin(t2) + \cos(t2))
*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2))) - \sin(t4)*(\cos(t3)*(\cos(t1)*\cos(t1)*\cos(t1))
*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))), 0, 14
 (\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) + 12*\cos(t1) - 16*(\cos(t4)*(\cos(t3)*(\cos(t1)*\sin(t2)))
 (t2) + \cos(t2) \cdot \sin(t1) + \sin(t3) \cdot (\cos(t1) \cdot \cos(t2) - \sin(t1) \cdot \sin(t2)) + \sin(t4) \cdot (\cos t2) + \cos(t2) \cdot \sin(t3) \cdot \sin(
 (t3)*(cos(t1)*cos(t2) - sin(t1)*sin(t2)) - sin(t3)*(cos(t1)*sin(t2) + cos(t2)*six
 (t1)))) + 17*(\cos(t4)*(\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)) - \sin(t3)*(\cos(t1))
*sin(t2) + cos(t2) *sin(t1))) - sin(t4) *(cos(t3) *(cos(t1) *sin(t2) + cos(t2) *sin(t1)) #
\sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)))) + 15*(\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t2)))
 (t1)*\sin(t2) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))
[\cos(t4)*(\cos(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2))
```

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```
\sin(t1) * \sin(t2)) + \sin(t4) * (\cos(t3) * (\cos(t1) * \cos(t2) - \sin(t1) * \sin(t2)) - \sin(t3) 
 (\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))), \cos(t4)*(\cos(t3)*(\cos(t1)*\cos(t2) - \sin(t1))
*\sin(t2)) - \sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1))) - \sin(t4)*(\cos(t3)*(\cos(t1))
*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2))), 0, 14
  (\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + 12*\sin(t1) + 16*(\cos(t4)*(\cos(t3)*(\cos(t1)*\cos))
  (t2) - \sin(t1) \cdot \sin(t2) - \sin(t3) \cdot (\cos(t1) \cdot \sin(t2) + \cos(t2) \cdot \sin(t1)) - \sin(t4) \cdot (\cos(t1) \cdot \sin(t2) + \cos(t2) \cdot \sin(t3)) = \sin(t4) \cdot \sin(t4) \cdot \cos(t4) \cdot \sin(t4) \cdot \sin
 (t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t3)
 (t2)))) + 17*(cos(t4)*(cos(t3)*(cos(t1)*sin(t2) + cos(t2)*sin(t1)) + sin(t3)*(cos(t1)*)
(x) + \cos(t^2) - \sin(t^2) + \sin(t^2) + \sin(t^4) + \cos(t^3) + \cos(t^4) + \cos(t^4) + \sin(t^4) + \cos(t^4) + \cos(t^
\sin(t3)*(\cos(t1)*\sin(t2) + \cos(t2)*\sin(t1)))) + 15*(\cos(t3)*(\cos(t1)*\sin(t2) + \cos(t3)))
(t2)*\sin(t1)) + \sin(t3)*(\cos(t1)*\cos(t2) - \sin(t1)*\sin(t2)))
[ K
0, k
0, 1, ∠
11 + 13 - 18]
[ 🗹
0, ∠
0, 0, 4
1]
ans =
[\cos(t1 + t2 + t3 + t4), -\sin(t1 + t2 + t3 + t4), 0, 17*\cos(t1 + t2 + t3 + t4)]
16*\sin(t1 + t2 + t3 + t4) + 14*\cos(t1 + t2) + 12*\cos(t1) + 15*\cos(t1 + t2 + t3)
[\sin(t1 + t2 + t3 + t4), \cos(t1 + t2 + t3 + t4), 0, 16*\cos(t1 + t2 + t3 + t4)]
17*\sin(t1 + t2 + t3 + t4) + 14*\sin(t1 + t2) + 12*\sin(t1) + 15*\sin(t1 + t2 + t3)
                                                                                                                                                                                                                                                                                             0, 1,Y
Ο,
11 + 13 - 18
                                                                                                                                                                                                                                                                                              0,0 \
Γ
                                                                                                                                         0,
11
```