In[101]:=
```
ClearAll[θ, d, a, α, A, P];
```

In[3]:=
```
θ = {θ1, θ2, θ3, θ4, θ5, θ6};
d = {d1, d2, d3, d4, d5, d6};
a = {a1, a2, a3, a4, a5, a6};
α = {α1, α2, α3, α4, α5, α6};
```

In[102]:=
```
θ = {θ1, θ2, θ3, θ4, θ5, θ6};
d = {L1, 0, 0, L3 + L4, 0, L5 + L6};
a = {0, L2, 0, 0, 0, 0};
α = {-π / 2, 0, -π / 2, π / 2, -π / 2, 0};

P = IdentityMatrix[4];
For [i = 1 , i ≤ 6 , i++ ,
 A =
  (Cos[θ[[i]]]  -Cos[α[[i]]] * Sin[θ[[i]]]  Sin[α[[i]]] * Sin[θ[[i]]]  a[[i]] * Cos[θ[[
   Sin[θ[[i]]]  Cos[α[[i]]] * Cos[θ[[i]]]  -Sin[α[[i]]] * Cos[θ[[i]]]  a[[i]] * Sin[θ[[
        0              Sin[α[[i]]]                Cos[α[[i]]]                d[[i]]
        0                   0                          0                       1

   );
 P = P.A; Print[i - 1, "A", i, "=", A // MatrixForm ];

]
```

" After Substitution from DH table: "

$$0A1=\begin{pmatrix} \text{Cos}[\theta 1] & 0 & -\text{Sin}[\theta 1] & 0 \\ \text{Sin}[\theta 1] & 0 & \text{Cos}[\theta 1] & 0 \\ 0 & -1 & 0 & L1 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$$1A2=\begin{pmatrix} \text{Cos}[\theta 2] & -\text{Sin}[\theta 2] & 0 & L2\,\text{Cos}[\theta 2] \\ \text{Sin}[\theta 2] & \text{Cos}[\theta 2] & 0 & L2\,\text{Sin}[\theta 2] \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$$2A3=\begin{pmatrix} \text{Cos}[\theta 3] & 0 & -\text{Sin}[\theta 3] & 0 \\ \text{Sin}[\theta 3] & 0 & \text{Cos}[\theta 3] & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$$3A4=\begin{pmatrix} \text{Cos}[\theta 4] & 0 & \text{Sin}[\theta 4] & 0 \\ \text{Sin}[\theta 4] & 0 & -\text{Cos}[\theta 4] & 0 \\ 0 & 1 & 0 & L3+L4 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$$4A5=\begin{pmatrix} \text{Cos}[\theta 5] & 0 & -\text{Sin}[\theta 5] & 0 \\ \text{Sin}[\theta 5] & 0 & \text{Cos}[\theta 5] & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$$5A6=\begin{pmatrix} \text{Cos}[\theta 6] & -\text{Sin}[\theta 6] & 0 & 0 \\ \text{Sin}[\theta 6] & \text{Cos}[\theta 6] & 0 & 0 \\ 0 & 0 & 1 & L5+L6 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

In[108]:=

```
Print ["0A6 " , "=", Grid[P] ];
```

0A6 =

Cos[θ6] (Cos[θ5] (Cos[θ4] (Cos[θ1] Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) + Sin[θ1] Sin[θ4]) + (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) Sin[θ5])	Cos[θ6] (Cos[θ4] Sin[θ1] - (Cos[θ1] Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) Sin[θ4]) - (Cos[θ5] (Cos[θ4] (Cos[θ1] Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) + Sin[θ1] Sin[θ4]) + (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) Sin[θ5]) Sin[θ6]	Cos[θ5] (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) - (Cos[θ4] (Cos[θ1] Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) + Sin[θ1] Sin[θ4]) Sin[θ5]	L2 Cos[θ1] Cos[θ2] + (L3 + L4) (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) + (L5 + L6) (Cos[θ5] (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) - (Cos[θ4] (Cos[θ1]

Sin[θ3]) Sin[θ5]) + (Cos[θ4] Sin[θ1] - (Cos[θ1] Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) Sin[θ4]) Sin[θ6]	Sin[θ1] Sin[θ4]) + (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) Sin[θ5]) Sin[θ6]	Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) + Sin[θ1] Sin[θ4]) Sin[θ5])	
Cos[θ6] (Cos[θ5] (Cos[θ4] (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) - Cos[θ1] Sin[θ4]) + (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) Sin[θ5]) + (-Cos[θ1] Cos[θ4] - (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) Sin[θ4]) Sin[θ6]	Cos[θ6] (-Cos[θ1] Cos[θ4] - (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) - Sin[θ4]) - (Cos[θ5] (Cos[θ4] (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) - Cos[θ1] Sin[θ4]) + (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) Sin[θ5]) Sin[θ6]	Cos[θ5] (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) - (Cos[θ4] (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) - Cos[θ1] Sin[θ4]) Sin[θ5]	L2 Cos[θ2] Sin[θ1] + (L3 + L4) (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) + (L5 + L6) (Cos[θ5] (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) - (Cos[θ4] (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) - Cos[θ1] Sin[θ4]) Sin[θ5])
Cos[θ6] (Cos[θ4] Cos[θ5] (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) - (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) + (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) Sin[θ5]) - (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) Sin[θ4] Sin[θ6]	-Cos[θ6] (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) Sin[θ4] - (Cos[θ4] Cos[θ5] (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) + (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) Sin[θ5]) Sin[θ6]	Cos[θ5] (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) - Cos[θ4] (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) Sin[θ5]	L1 - L2 Sin[θ2] + (L3 + L4) (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) + (L5 + L6) (Cos[θ5] (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) - Cos[θ4] (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) Sin[θ5])
0	0	0	1

In[109]:=

```
X = P[[1]][[4]];
Y = P[[2]][[4]];
Z = P[[3]][[4]];
Print["X", "= ", X];
Print["Y", "= ", Y];
Print["Z", "= ", Z];
```

```
X= L2 Cos[θ1] Cos[θ2] + (L3 + L4) (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) +
   (L5 + L6) (Cos[θ5] (-Cos[θ1] Cos[θ3] Sin[θ2] - Cos[θ1] Cos[θ2] Sin[θ3]) -
      (Cos[θ4] (Cos[θ1] Cos[θ2] Cos[θ3] - Cos[θ1] Sin[θ2] Sin[θ3]) + Sin[θ1] Sin[θ4])
       Sin[θ5])
```

```
Y= L2 Cos[θ2] Sin[θ1] + (L3 + L4) (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) +
   (L5 + L6) (Cos[θ5] (-Cos[θ3] Sin[θ1] Sin[θ2] - Cos[θ2] Sin[θ1] Sin[θ3]) -
      (Cos[θ4] (Cos[θ2] Cos[θ3] Sin[θ1] - Sin[θ1] Sin[θ2] Sin[θ3]) - Cos[θ1] Sin[θ4])
       Sin[θ5])
```

```
Z= L1 - L2 Sin[θ2] + (L3 + L4) (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) +
   (L5 + L6) (Cos[θ5] (-Cos[θ2] Cos[θ3] + Sin[θ2] Sin[θ3]) -
      Cos[θ4] (-Cos[θ3] Sin[θ2] - Cos[θ2] Sin[θ3]) Sin[θ5])
```