بسمه تعالی

**تمرین اول** **رباتیک**

**تحویل ۲۸ مهر روی سامانه درس‌افزار** **پاییز ۱۴۰۲**

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The following MATLAB function generates the homogenous transformation for translation of *distance* along *axis*

```
function T=Trans(axis, distance)
%Homogenous transformation along "axis" for the amount of "distance"
axis=upper(axis);
if (axis == 'X')
T=[1 0 0 distance; 0 1 0 0; 0 0 1 0; 0 0 0 1];
end
if (axis == 'Y')
T=[1 0 0 0; 0 1 0 distance; 0 0 1 0; 0 0 0 1];
end
if (axis =='Z')
T=[1 0 0 0; 0 1 0 0; 0 0 1 distance; 0 0 0 1];
end
```

1. Write a similar MATLAB function that returns a homogenous transformation for a rotation about *axis* (which is either X, Y or Z) for *angle*

```
function R=Rot(axis, angle)
```

2. Write a MATLAB function that finds and returns the location of the square blue block of size 5cm with respect to frame zero using a product of standard homogenous transformations. ($a$ = 20 $cm$, b = 20 $cm$, c = 40 $cm$, d = 15 $cm$, $e$ = 15 $cm$)