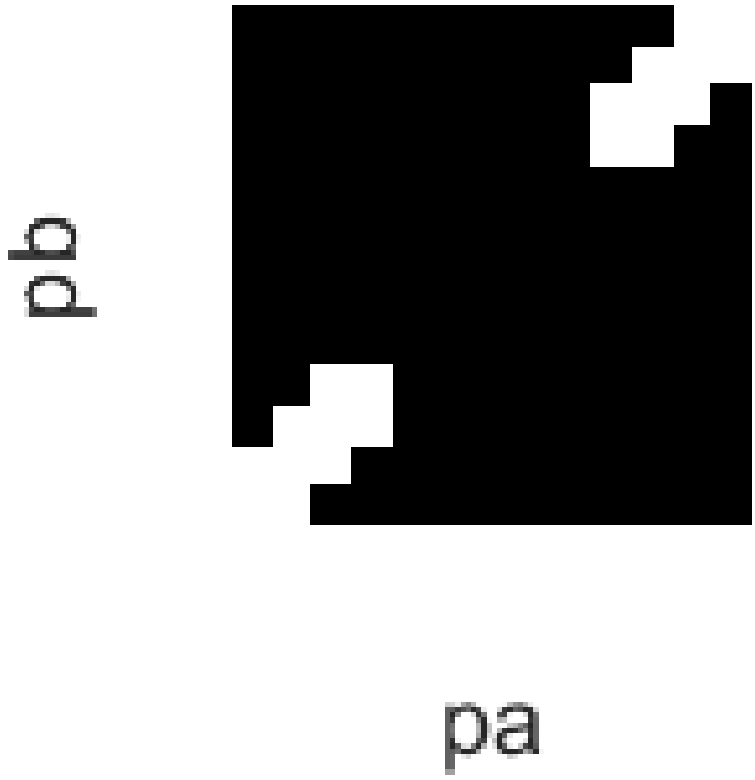
Programming Partners: Aditya Bondada, Mani Chandan Chakinala

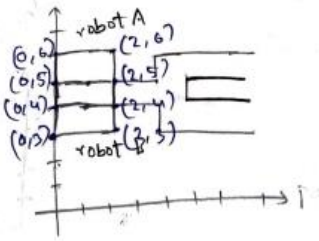
C0.



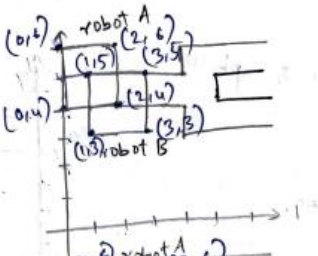
(a) Here, pa is the path taken by robot A on the track, that is on top of the rectangle. Whereas, pb is the path taken by robot B on the track, that is at the bottom of the rectangle. In cspace, X-axis is pa and Y-axis is pb. There is a collision in work space between robot A and robot B, if its configuration space value is 0 i.e., it is white. On the other hand, there is no collision in work space between robot A and robot B, if its configuration space value is 1 i.e., it is black. Limits of pa are 1 and 13 respectively. Limits of pb are 1 and 13 respectively. The configuration in the question represents pa = 6.5 and pb = 4.5.

C0. (b)

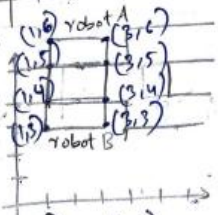
(b) for pa=1 & pb=1



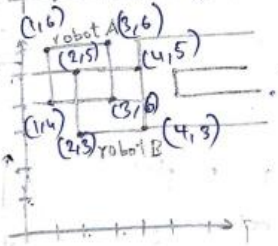
for pa=1 & pb=2



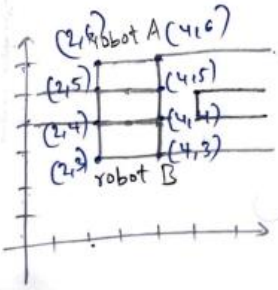
for pa=2 & pb=2



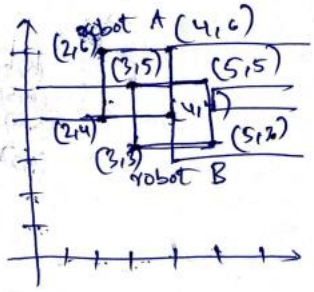
for pa=2 & pb=3



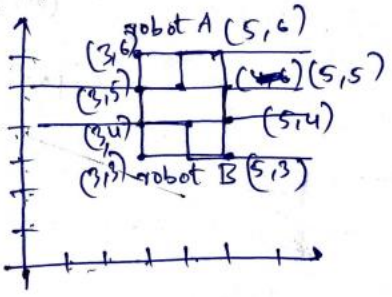
for pa=3 & pb=3



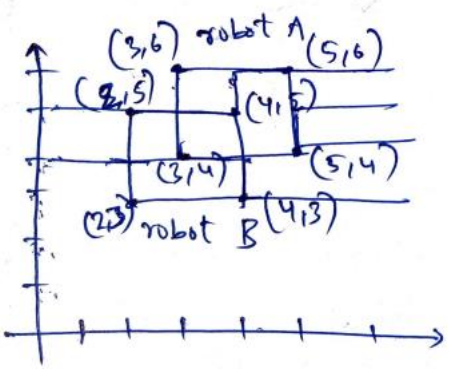
for pa=3 & pb=4



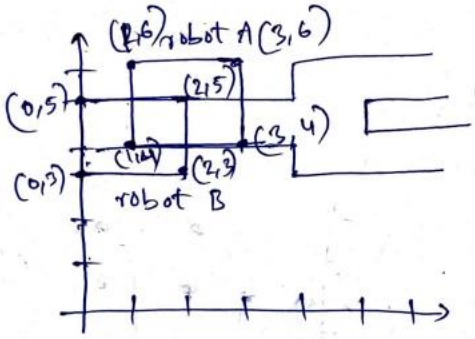
for pa=4 & pb=4



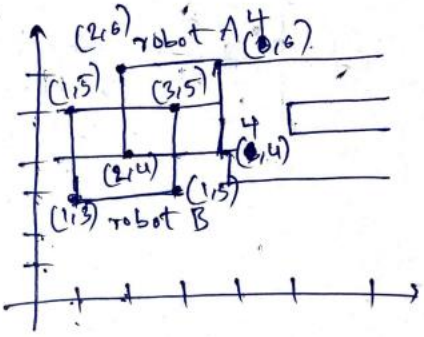
for pa=4 & pb=3



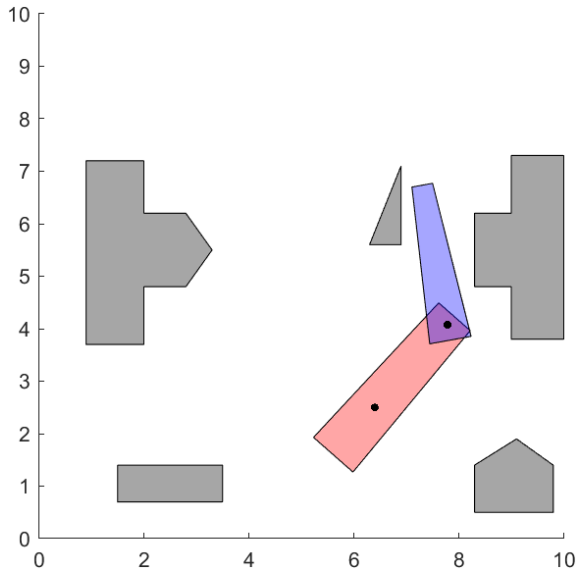
for pa=2 & pb=1

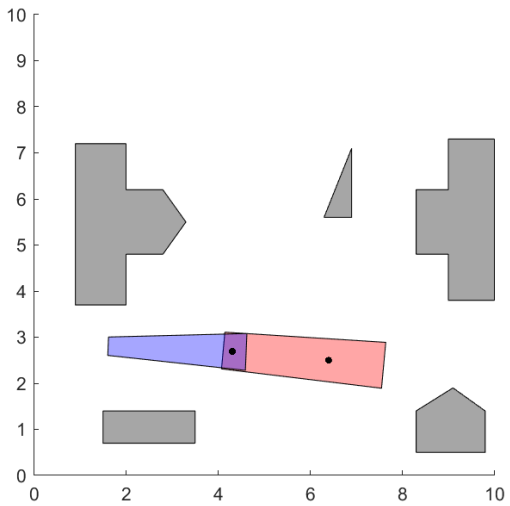


for pa=3 & pb=2



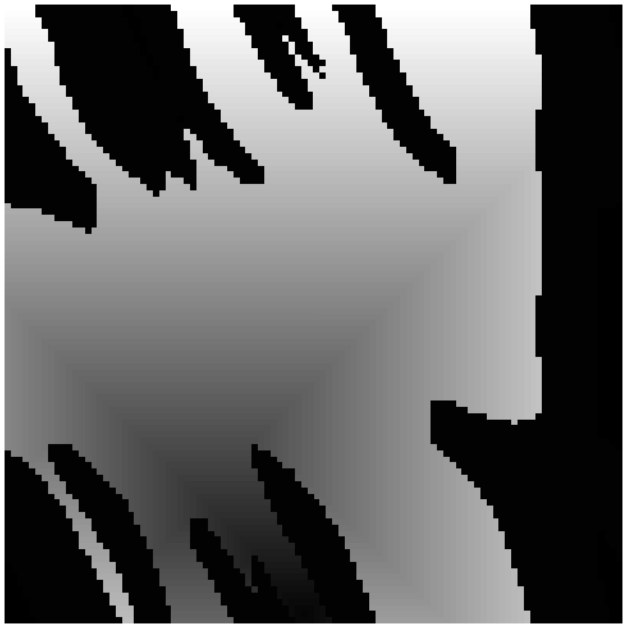
C1. **start configuration** **end configuration**





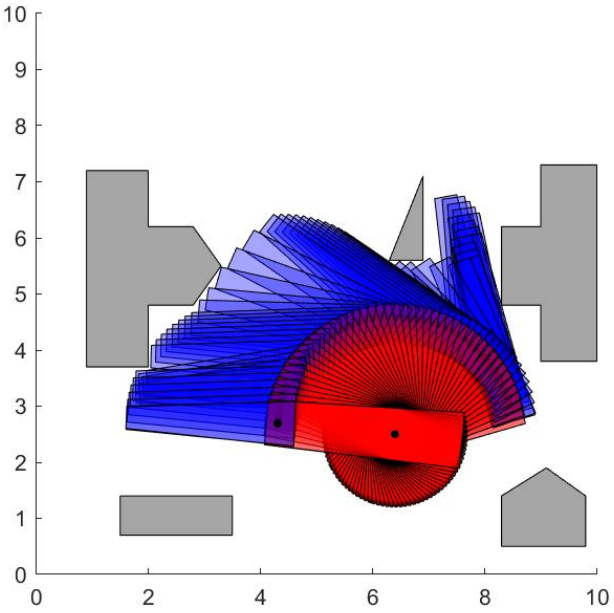
C2. **for resolution = 100** **for resolution = 200**

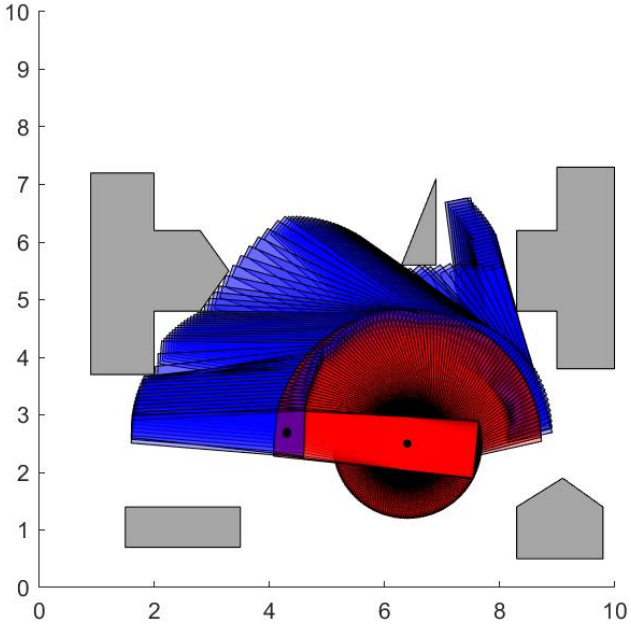
C3. **for resolution = 100** **for resolution = 200**



C4. **for resolution = 100** **for resolution = 200**

C5. **for resolution = 100** **for resolution = 200**



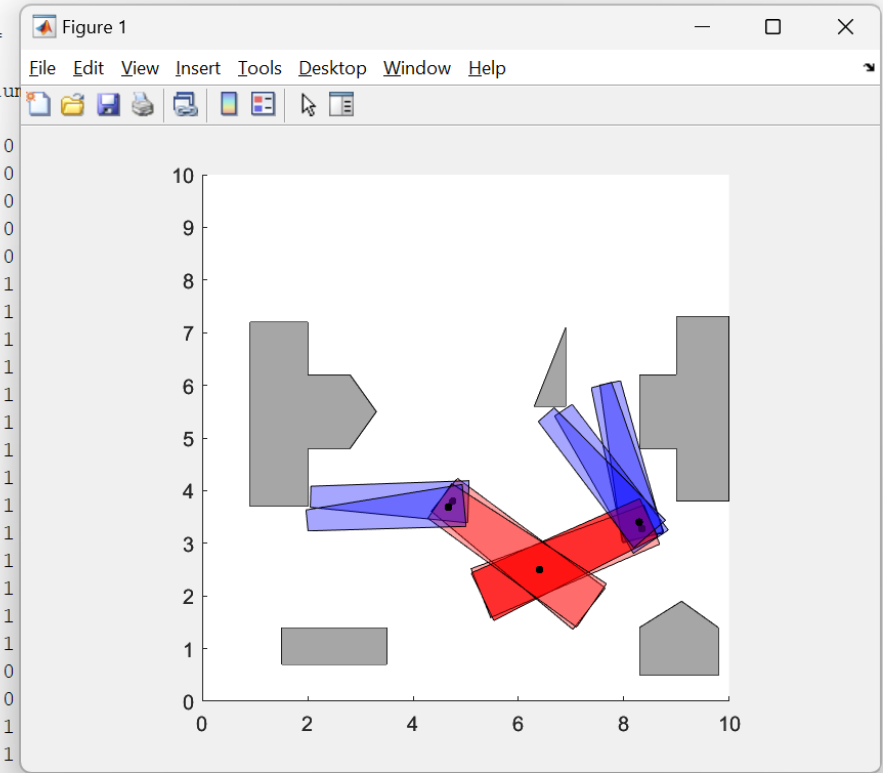


C6. **for resolution = 100**

```
>> hw2_cspace(6, cspace)
Path contains 3 collisions.

ans =

  Colu
```

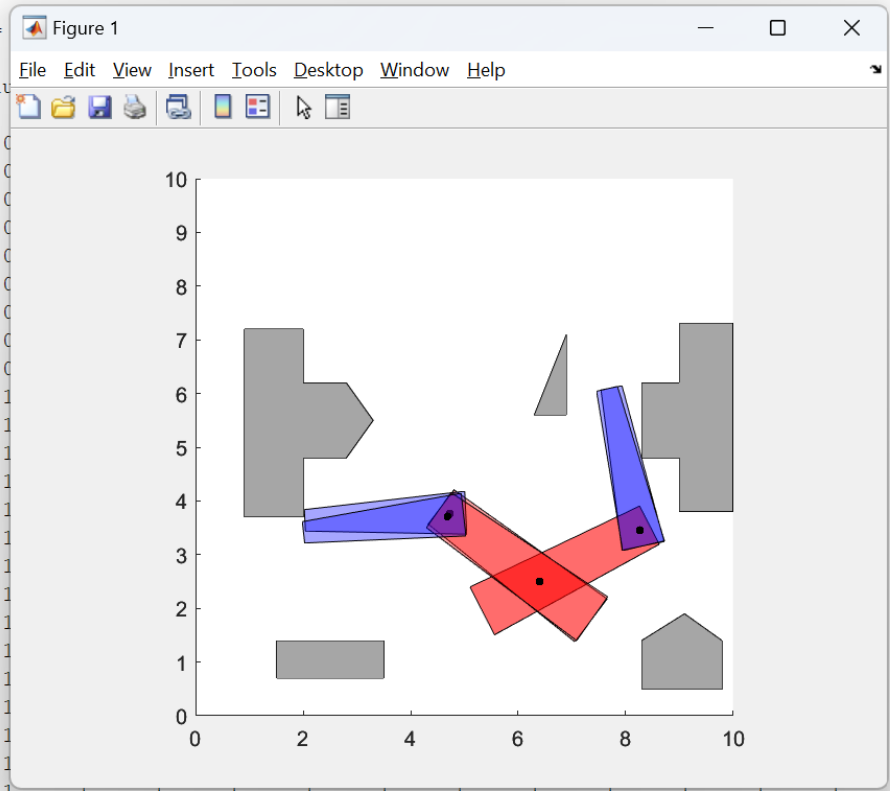


for resolution = 200

```
Path contains 2 collisions.

ans =

  Colu
```



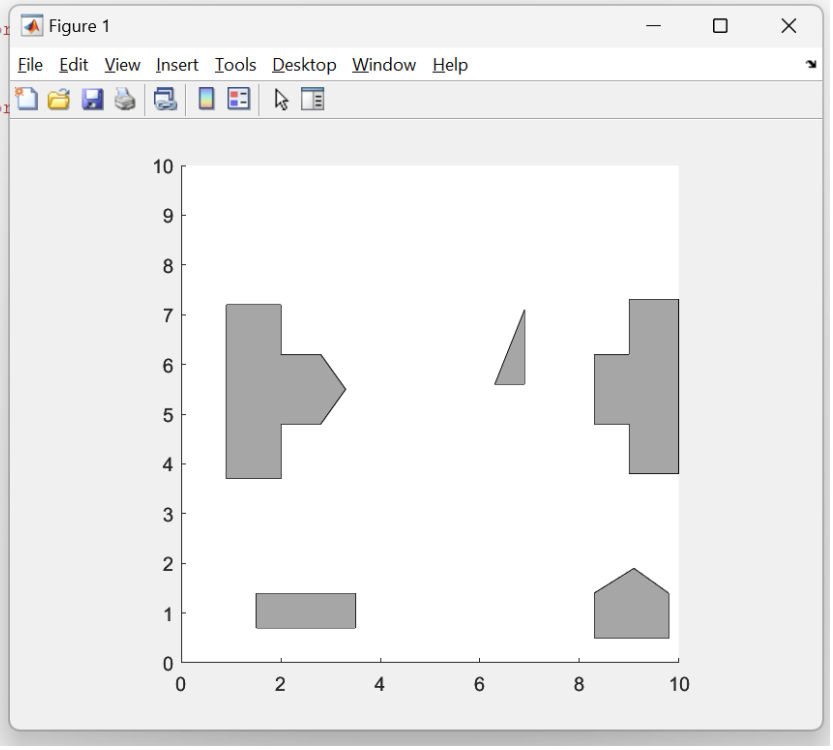
C7. **for resolution = 100**

```
>> hw2_cspace(7, cspace)
Index in position 1 exceeds array bounds. Index must not exceed 1.

Error

Error

>>
```



for resolution 100, the path can not be generated because the resolution is too low

for resolution = 200

```
>> hw2_cspace(7, cspace)
Path contains 0 collisions.

ans =
```