22437 - Industrial Vision
Lab 7: Developing tools, Counting Shoes

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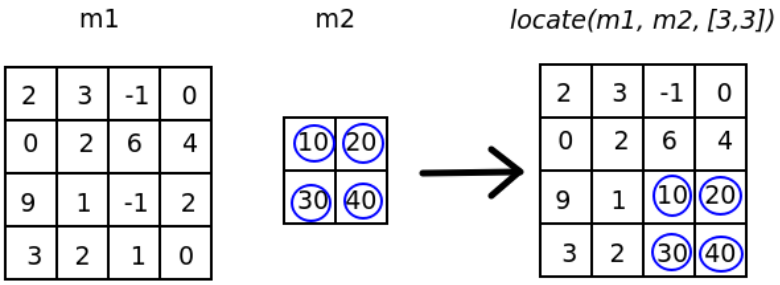
Useful functions: *bwlabel*, *imfill*

1. Write a function in Matlab to insert a matriz into another bigger matrix in the specified position. The function signature should be:

```
function out = locate(m1, m2, p)
```

where *m1* is the original bigger matriz, *m2* is the smaller matrix that is going to be inserted in *m1*, and *p* is a two coordinates array that points to the position in m1 that has to be inserted element (1,1) of textitm2. Out is the matrix *m1* with the inserted matrix *m2* at the specified position. When the operation can't be performed because of the matrix sizes, set the output as *m1*.

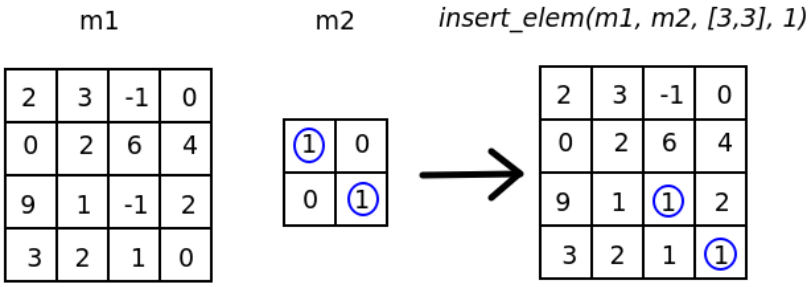


2. Write a function in Matlab to insert one specific value of a matrix into another bigger matrix in the specified position. The function signature should be:

```
function out = insert_elem(m1, m2, p, val)
```

where *m1* is the original bigger matriz, *m2* is the matrix whose cells with given value *val* are going to be inserted into m1, *p* is a two coordinates array that points to the position in m1 that corresponds with position (1,1) of *m2*, *p* is the value to be searched in *m2* and inserted in *m1*. Out is the matrix *m1* with the inserted values. When the operation can't be performed because of the matrix sizes, set the output as *m1*.

Hints: *find*, *sub2ind*



3. Implement a script in Matlab to separate the objects from the background and counting automatically the number of shoes present in the image *shoes1.jpg*. If required, adapt the script to be used with images *shoes2.jpg* and *shoes3.jpg*. You can use any technique explained in previous labs so far.

   Hints: Use the function *bwlabel* to count objects and *imfill* to fill holes in objects.