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19.02.2021

DSA EXAM S1

a.
```
void radix-sort(movie movieArr[], unsigned size) {
    i = 0;
    j = size - 1;
    do {
            for ( ; i ≤ j ; movieArr[i].award==0 ~~)~~ i++)
            {;}  // finds movies with no award from front
            for ( ; i ≤ j ; movieArr[j].award == 1 ; j--)
             {;}  // finds movies with award from back
             if ( i ≤ j)  // swaps places of movies
                 swap ( movieArr[i], movieArr[j]);
    while ( i<=j)

}
```

radix sort on one bit (award) $O(n \cdot k) \Rightarrow O(n)$
$k = 1$

b.
```
void sort_awarded (movieArr[], posLast) {
    movie maxMovie; unsigned index;
    for ( i=0 ; i < posLast ; i++) {
        maxMovie = movieArr[i]; index=i;
        for ( j = i+1; j <= posLast ; j++)
            if ( strcmp (maxMovie.name, movieArr[j].
                 name ) < 0 ) // ~~finds~~
            {
               maxMovie = movieArr[j];
               index = j
            }
        ~~movieArr[i]~~
        swap (movieArr[i] , movieArr[index])

}
```

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selection sort => O(n)
1st for - begining -> pos of last movie with award
2nd for - i -> pos of last movie with award
because before pos i => sorted
if - finds movie ~~with~~ alphabetically (reversed)
=> stored in maxMovie and index (pos)
swaps movieArr [i] with movieArr ~~of index the~~
with index of max Movie

Example: (year is irrelevant)

```
Arr:   A  D  B  G  C  Z
       1  0  1  1  1  0
       i->            <-j

       A  D  B  G  C  Z
       1  0  1  1  1  0
          i           j
           `found

       A  D  B  G  C  Z
       1  0  1  1  1  0
          i        j - found

       ~~A  D  B  G  C  Z~~

swap:  A  C  B  G  D  Z
       1  1  1  1  0  0
                |
             posLast
```

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```
A C B G D Z
1 1 1 1 0 0
i
j ——>
```

```
A C B G D Z
1 1 1 1 0 0
i
      j-found
```

~~swap~~ ~~B G C B A~~

swap:

```
G C B A D Z
1 1 1 1 0 0
  i
  j ——> finds nothing: swaps C with C
                      (nothing happens)
```

```
G C B A D Z
1 1 1 1 0 0
    i
    j -> finds nothing...
```

~~G C B A D Z~~
~~1 1 1 1 0 0~~

data structs: arrays - fixed number of element
and the given movie data structure