Assignment 3

Due: March 5th in class

UBIT:
UB # Number:

*** PLEASE PRINT THIS AND WRITE YOUR ANSWER IN THE TABLE**

Consider the relation:
StarsIn(movieTitle, movieYear, starName)

And suppose there are three database operation that we perform:

Q1.
```
SELECT movieTitle, movieYear
FROM StarsIn
Where starName = s;
```

Q2.
```
SELECT starName
FROM StarsIn
WHERE movieTitle = t and movieYear = y;
```

Q3. Insert Into StarsIn VALUES (t, y, s);

Assume the following:

1. StarsIn occupies 10 pages, so if we need to examine the entire relation the cost is 10.
2. On the average, a star has appeared in 3 movies and a movie has 3 stars.
3. Since the tuples for a given star or a given movie are likely to be spread over the 10 pages of StarsIn, even if we have an index on starName (Star Index) or on the combination of movieTitle and movieYear (Movie Index), it will take 3 disk accesses to find the (average of) 3 tuples for a star or movie. If we have no index on the star or movie, respectively, then 10 disk accesses are required.
4. Assume the index is B+ tree
5. The entire index is stored on one page. To elaborate: one disk access is needed to read a page of the index every time we use that index to locate tuple with a given value for the indexed attribute(s). If an index page must be modified, then another disk access is needed to write back the modified page.
6. Likewise, in the case of insertion, one disk access is needed to read a page on which the new tuple will be placed, and another disk access is needed to write back this page. We assume that, even without an index, we can find some page on which an additional tuple will fit, without scanning the entire relation.
7. Assume to examine even one tuple you need to bring the whole page to main memory, and for simplicity the time to examine all the tuples in a page is just more than the time taken to examine one.
8. DO NOT assume that any page is in memory.

Based on these assumption **fill** the below table giving the disk operation costs of the three queries.

Query	No Index	Star Index	Movie Index	Both Index
Q1				
Q2				
Q3				

Also write in one line which index is prefered under which case:

- No index:
- Star Index:
- Movie Index:
- Both Index: