

DATABASE

INDEXES

INTERSECTION - UNION

COVERING INDEX

CLUSTERED INDEX



Composite indexes

- **Queries**

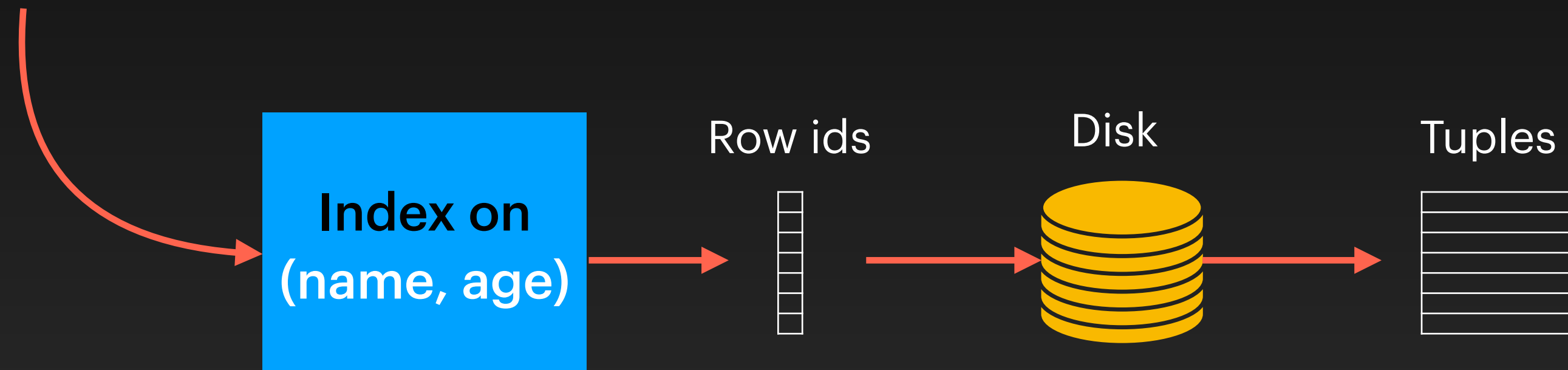
- **Name** = 'John' AND **age** > 30
- **Name** = 'Ann' AND **Job** = 'Manager'

- **Which indexes to build?**

- Single-column indexes (**Name**), (**age**), (**job**)
- (**Name**, **age**)
- (**Name**, **job**)
- (**Name**, **age**, **job**) or (**Name**, **job**, **age**)

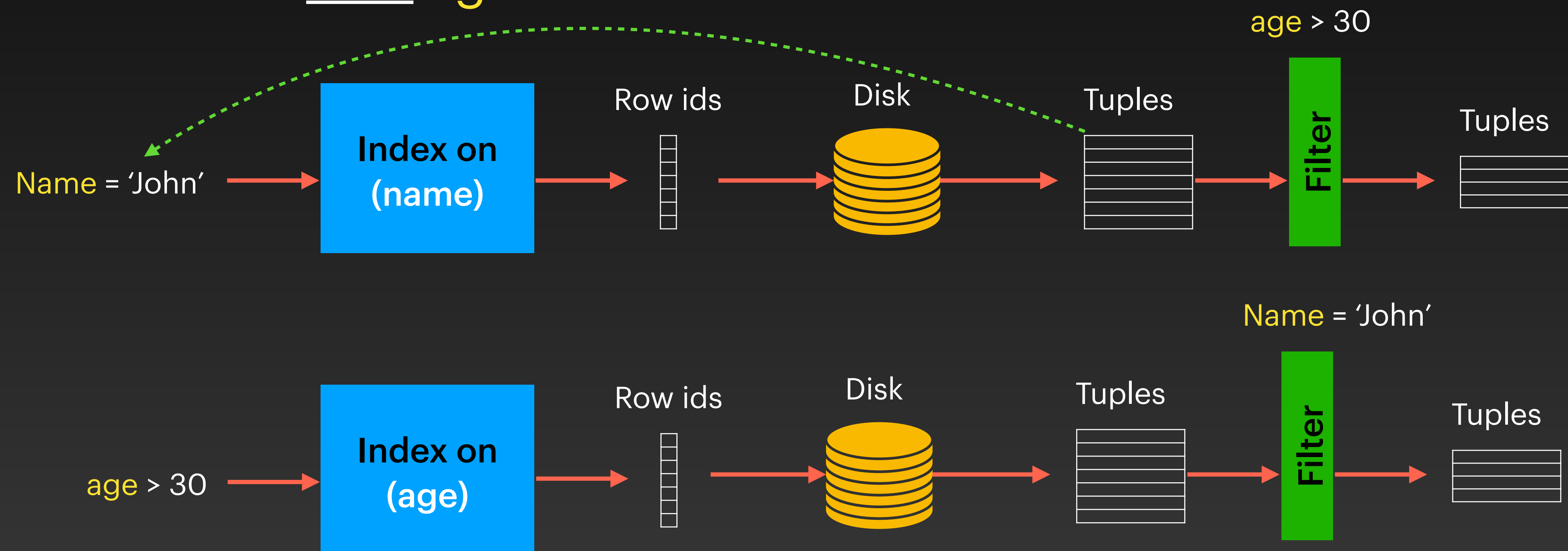
Query on 2 attributes

Name = 'John' AND age > 30



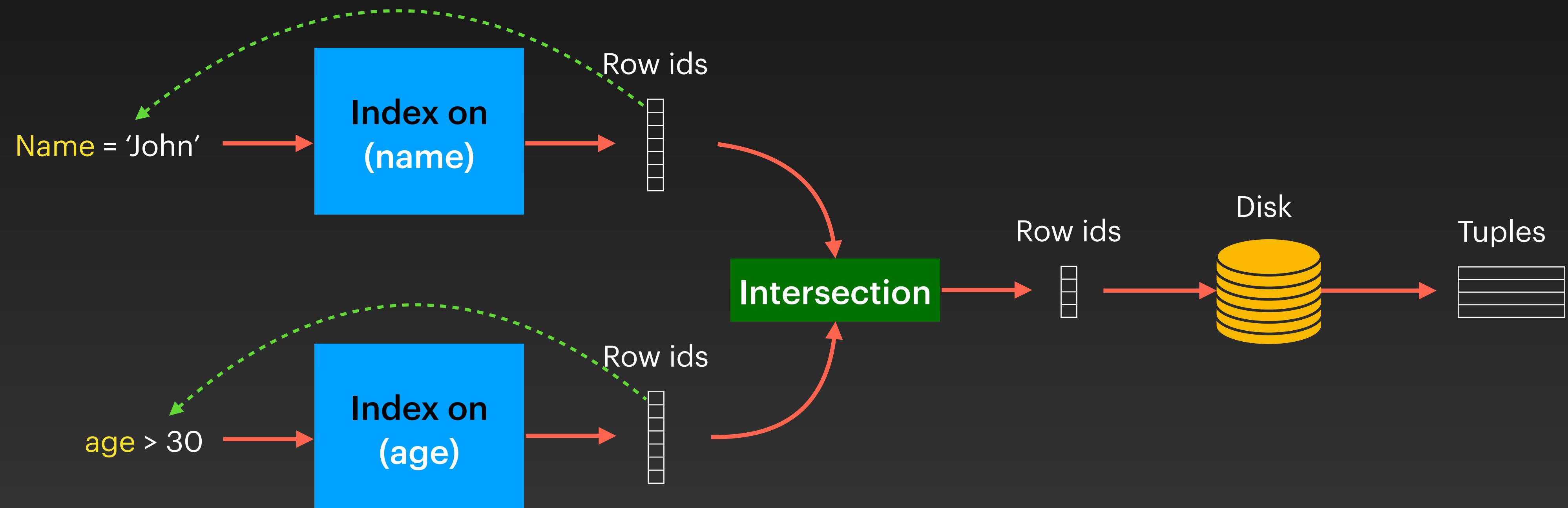
Query on 2 attributes

Name = 'John' AND age > 30



Query on 2 attributes

Name = 'John' AND age > 30



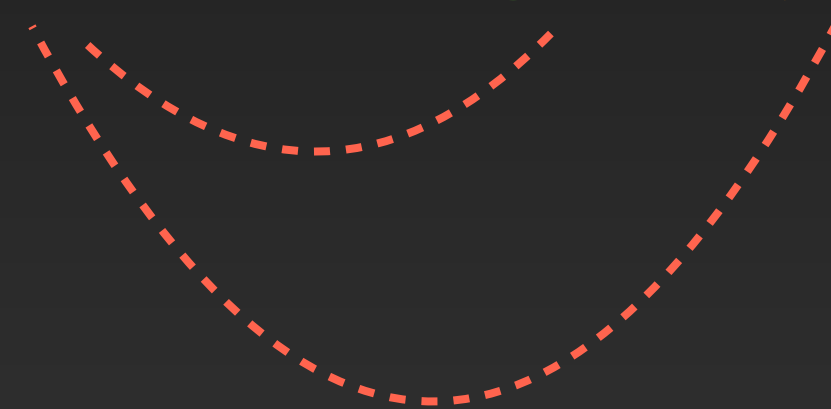
Index intersection

- **Queries**

- **Name** = 'John' AND **age** > 30
- **Name** = 'Ann' AND **Job** = 'Manager'

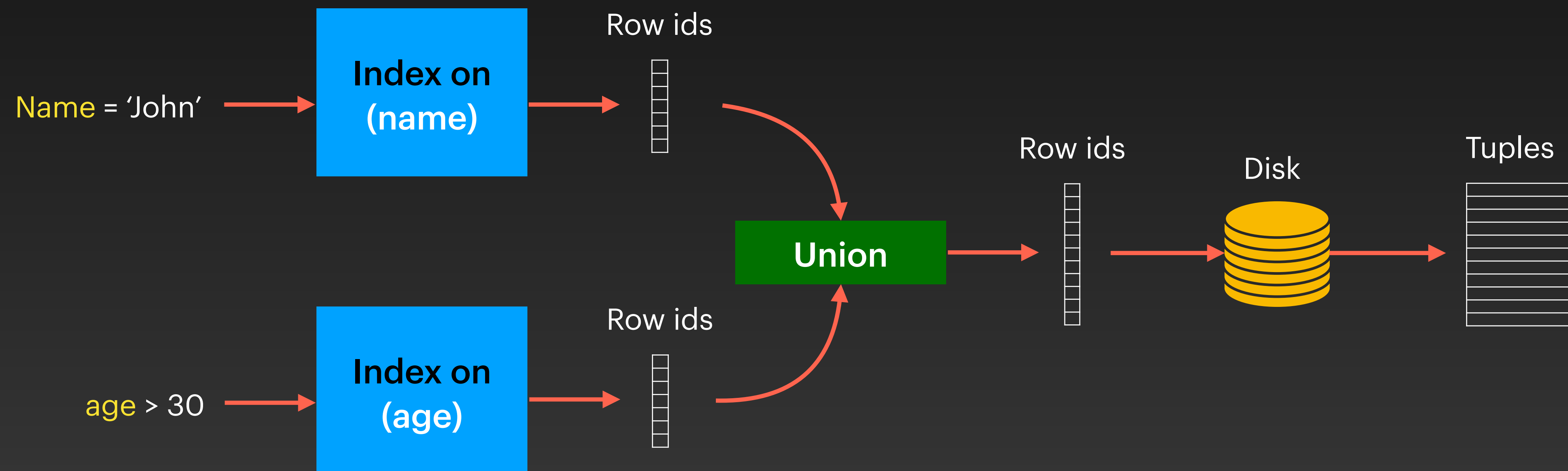
- **Which indexes to build?**

- Single-column indexes **(Name)**, **(age)**, **(job)**



Query on 2 attributes

Name = 'John' OR age > 30



Covering Index

Index on (age)

Covering?

```
SELECT *  
FROM person  
WHERE age < 20
```



```
SELECT age  
FROM person  
WHERE age < 20
```



Covering Index

Index on (name, age)

Covering?

```
SELECT *  
FROM person  
WHERE age < 20  
AND name = 'John'
```



```
SELECT age  
FROM person  
WHERE age < 20  
AND name = 'John'
```



Covering?

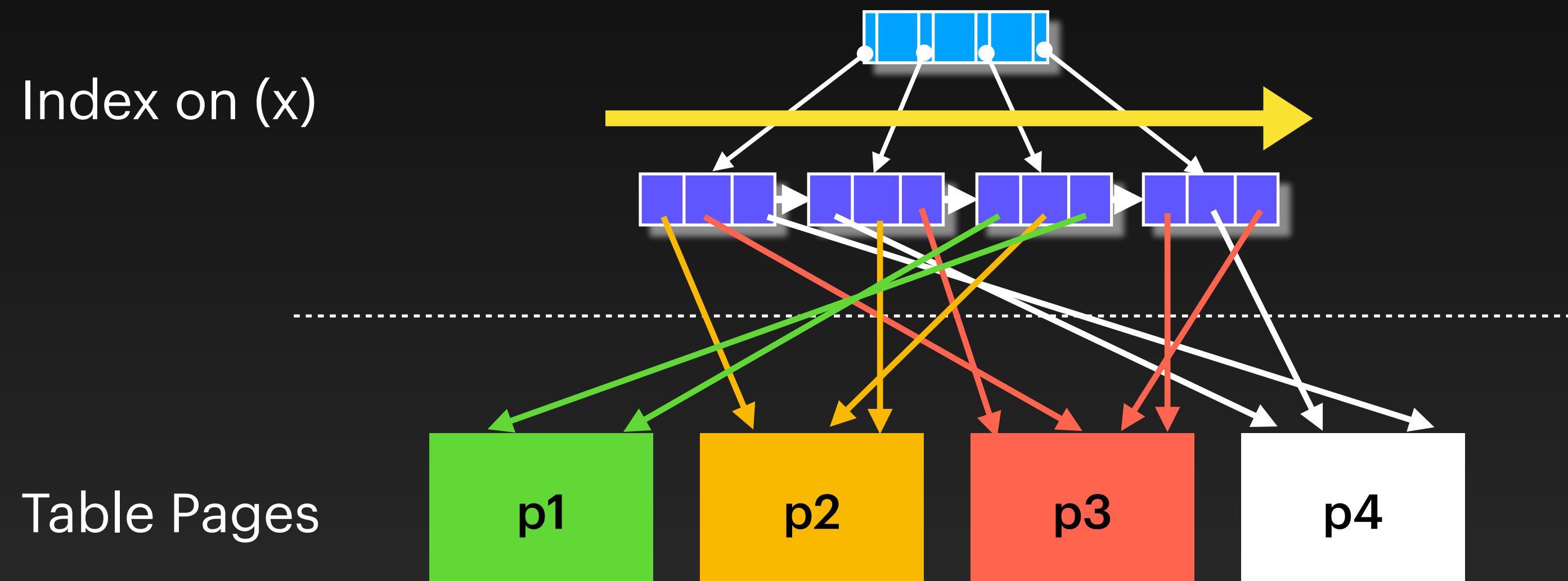
```
SELECT name  
FROM person  
WHERE age < 20
```



```
SELECT age  
FROM person  
WHERE name = 'John'
```



Non-clustered index



Clustered index

