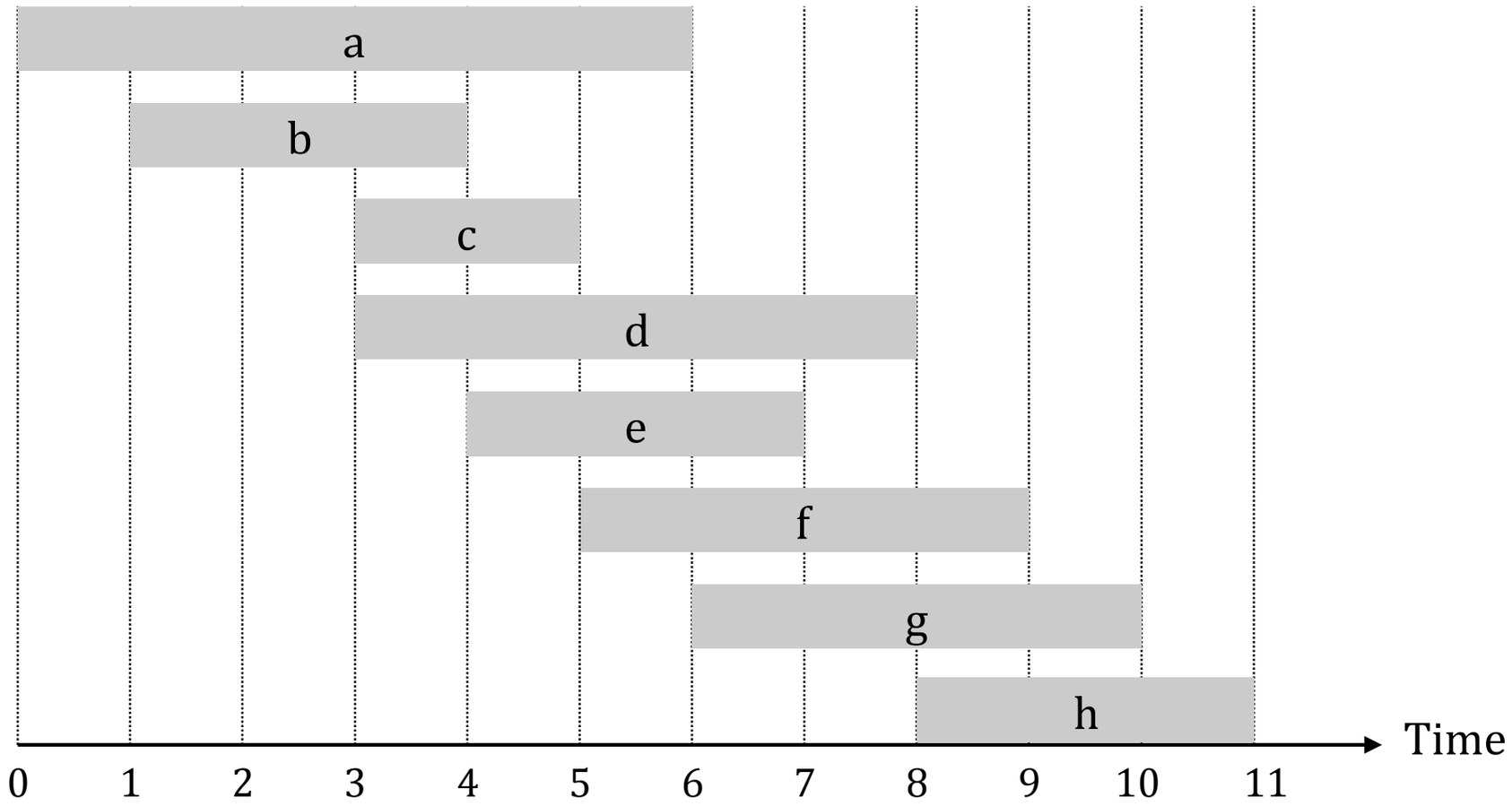
Greedy Algorithms

"Builds up solution in small steps, choosing a decision at each step **myopically** to optimize some underlying criterion."

Interval Scheduling

- Job j starts at s_j and finishes at f_j
- Two jobs are compatible if they do not overlap
- The goal is to find the maximum subset of mutually compatible jobs



Interval Scheduling: a Greedy Choice

Consider the jobs in some order. Take each job provided that it is compatible with the ones already taken.

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- **Earliest start time** Consider jobs in ascending order of start time s_j

- **Shortest interval** Consider jobs in ascending order of interval length $f_j - s_j$

- **Fewest conflicts** Consider jobs in ascending order of number of conflicts

- **Earliest finish time** Consider jobs in ascending order of finish time f_j

Interval Scheduling: Greedy Algorithm

```
Sort jobs by finish times so that f_1 ≤ f_2 ≤ ... ≤ f_n.

A ← ϕ
for j = 1 to n {
    if (job j compatible with A)
        A ← A ∪ {j}
}
return A
```

jobs selected