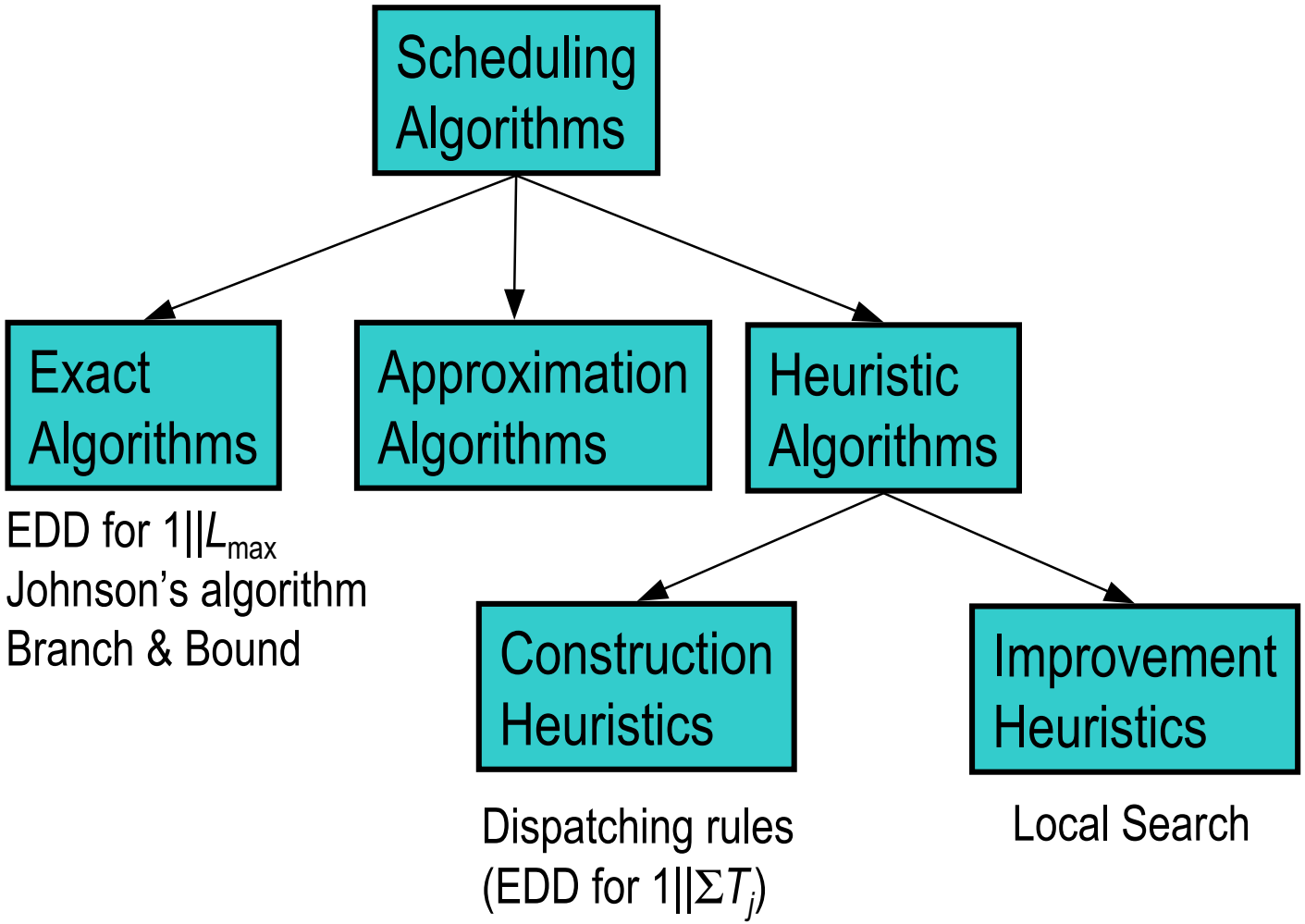
Last lecture:

- flow shop

This lecture:

- dispatching rules (Handout “Types of Algorithms”)

Algorithms Classification



Dispatching Rules

A ***dispatching rule*** is a rule that prioritises all the jobs that are awaiting for processing on a machine.

Whenever a machine has been freed, a dispatching rule inspects the waiting jobs and selects the job with the highest priority.

Dispatching Rules

Advantages of dispatching rules:

- Very simple to implement
- Fast
- Can find a reasonably good solution in a relatively short time
- Optimal for special cases

Disadvantages of dispatching rules:

- Limited use in practice
- Can find unpredictably bad solution

Rule			Objectives
SPT	Shortest Processing Time first	$\uparrow p_j$	ΣC_j
LPT	Longest Processing Time first	$\downarrow p_j$	C_{max}
ECT	Earliest Completion Time first (here t is the estimated starting time of job j in the partial schedule)	$\uparrow t + p_j$	ΣC_j
WSPT	Weighted Shortest Processing Time first	$\uparrow p_j / w_j$	$\Sigma w_j C_j$
WI	With Biggest Weight	$\downarrow w_j$	$\Sigma w_j C_j$
ERD	Earliest Release Date first (equivalent to First-Come-First-Served rule, FCFS)	$\uparrow r_j$	Various criteria
EDD	Earliest Due Date first	$\uparrow d_j$	L_{max}

Dispatching Rules

The basic dispatching rules are of limited use:

- when a complex objective has to be minimised, none of the basic dispatching rules can perform effectively;
- combination of basic dispatching rules can perform significantly better.

Composite Dispatching Rules

- It is a ranking expression that combines a number of basic dispatching rules.
- Each basic rule in the composite dispatching rule has its own scaling parameter that is chosen to properly scale the contribution of the basic rule to the total ranking expression.

Choosing an Algorithm