Strukture podataka i algoritmi

Stabla

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Stabla

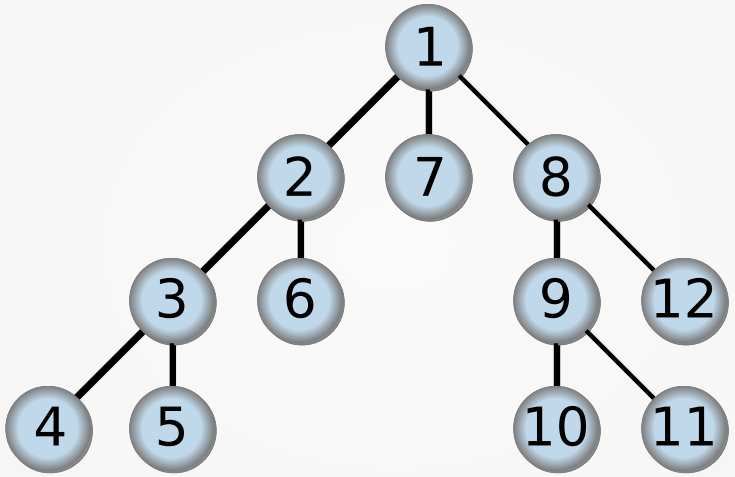
- Obilasci
  - Ispiši sve direktorije
  - Posjeti sve lokacije
  - Osiguraj da se sve komponente provjere
  - Provjeri imaš li sve potrebne djelove (koda, oklopa...)
  - ...

Stabla

- Obilasci
  - Grafa
  - Mreže
  - Stabla
- Obilasci (Traversal)
  - Dubinski (depth-first)
  - Širinski (breadth-first)

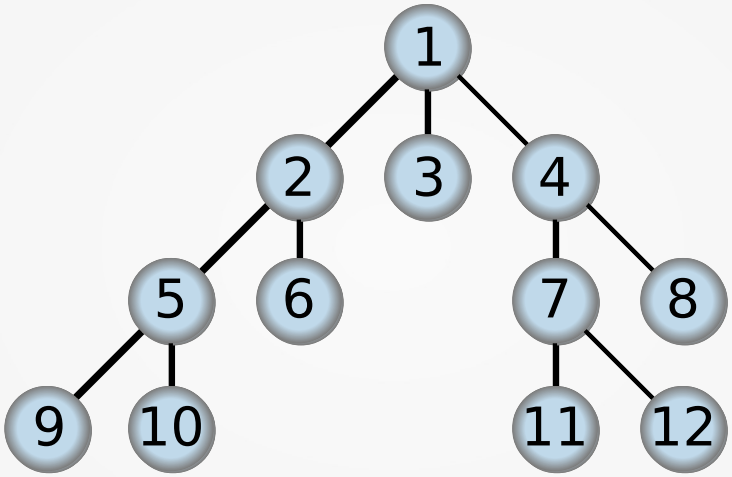
Stabla

Dubinski obilazak



Stabla

Širinski obilazak



Stabla

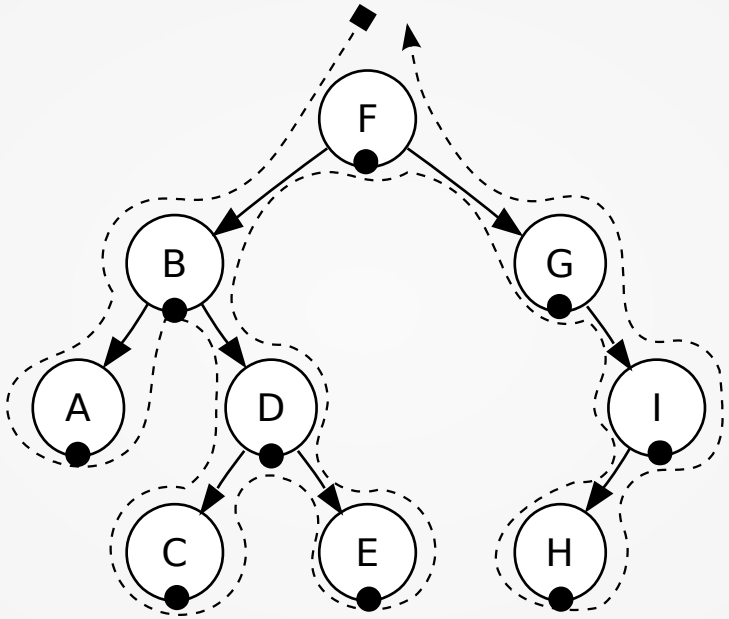
- Depth-first traversal
  - Inorder
  - Preorder
  - Postorder

Stabla

- Depth-first traversal (Dubinski obilasci)
  - Inorder (Slijedno, s lijeva na desno)
  - Preorder (Prvo roditelji)
  - Postorder (Prvo djeca)

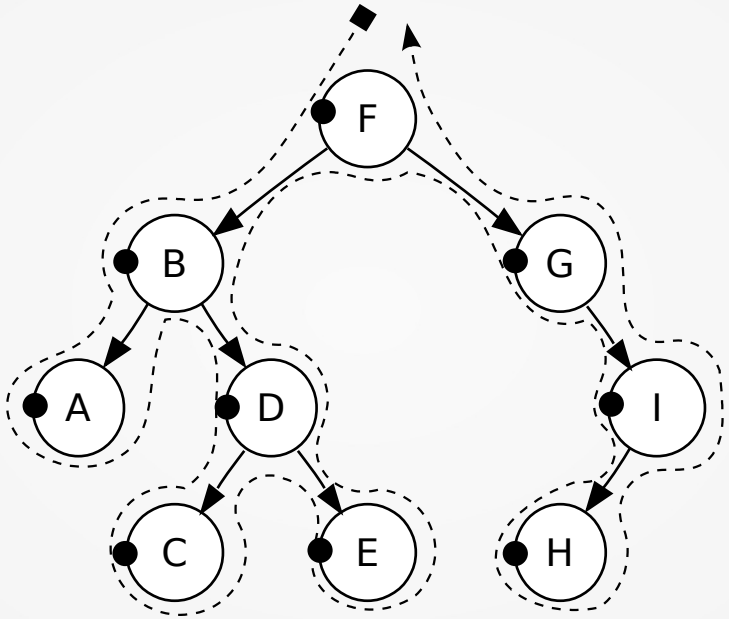
Stabla

Inorder
(LVR)



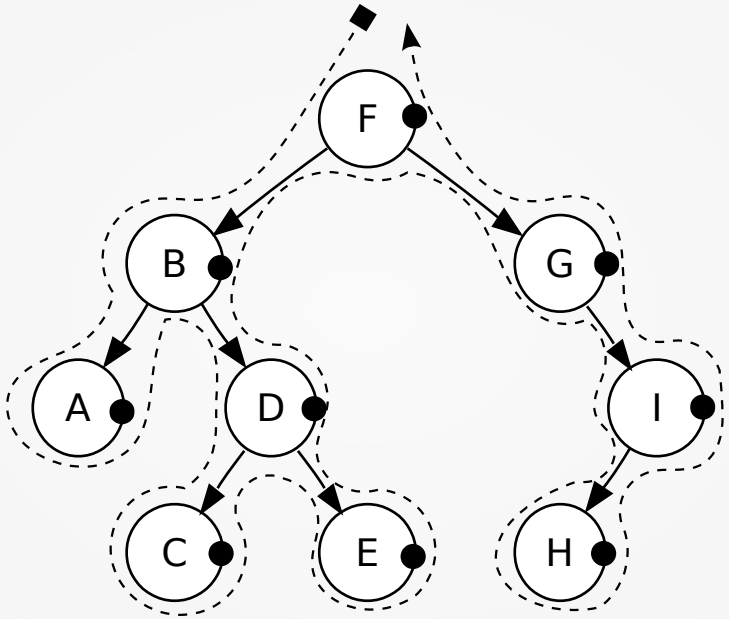
Stabla

Preorder
(VLR)



Stabla

Postorder
(LVR)

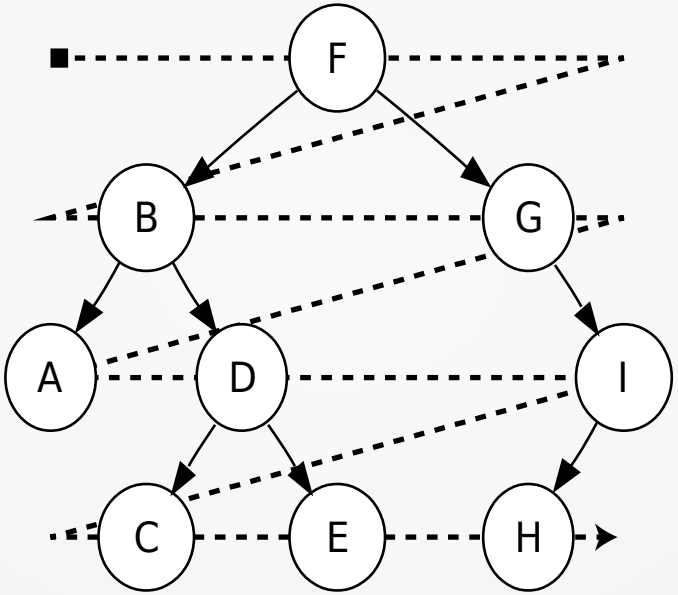


Stabla

- Breadth-first traversal
  - Levelorder

Stabla

Levelorder

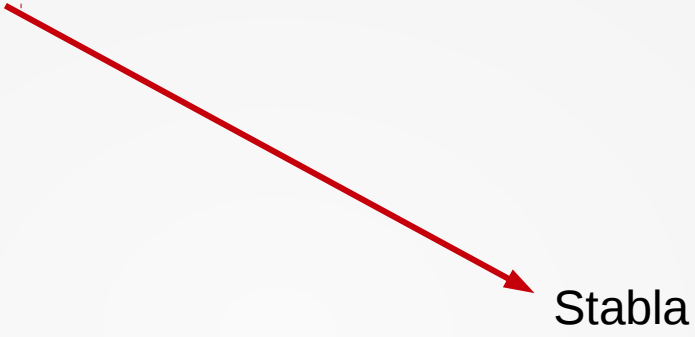


Stabla

- Binary search trees (a.k.a. BST)

Stabla

- Binary search trees



Stabla

- Binary search trees

Omogućuju **pretraživanje:**

- Pronađi objekt
- Minimum
- Maksimum
- Sljedbenik
- Prethodnik
- Ubaci
- Izbriši

Stabla

- Binary search trees

Binarno stablo:
- DA, NE
- 0, 1
- ...

Stabla

- Složenost osnovnih operacija u stablu
  - Proporcionalna visini stabla O(h)
- Niz (lista) kao linearan lanac grana
  - Složenost (u najgorem slučaju) O(n)
- Potpuno binarno stablo
  - Složenost O(log n)

Stabla

- Uređeno binarno stablo lakše je pretražiti
- BST je (stoga) uređeno
- Balansirano stablo ima manju dubinu
  - I stoga manju algoritamsku složenost
- Kako osigurati da stablo ostane uređeno/balansirano ako ubacujemo ili brišemo elemente (čvorove)?

Stabla

- Brisanje čvorova
- Samobalansiranje stabla
  - AVL stablo
  - CC stablo
  - ...