02/22/12

git-bisect

Bugsquashing Seminar

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Purpose

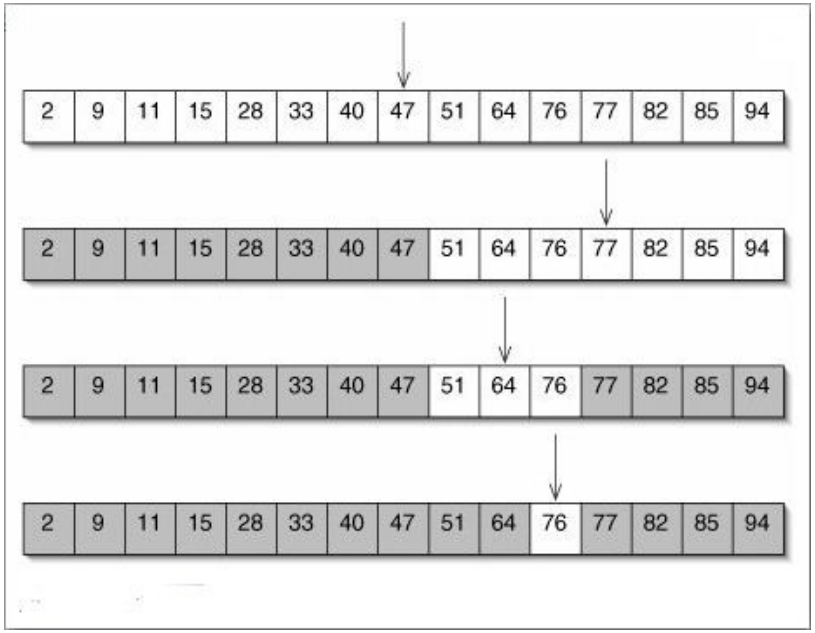
- detect the first commit a bug occured

- in complex programs – behaviour can depend on several modules (classes)
- the change cannot be identified by git-blame or by parsing commit messages

=> **brute-force search** through the history unavoidable

Motivation

- fastest search in **sorted** array : **binary search**



Average Case	O(log n)
Worst Case	O(log n)
Best Case	O (1)

- in a **repository**
  - sorted array : *list of commits*
  - binary relation : *buggy / working*

git-bisect : Initialization

- **git-bisect** <option>

- Initialize search boundaries
  - **`git bisect start`**
  - **`git bisect good`** *`<commit>`*
  - **`git bisect bad`** *`<newer_commit>`*`|HEAD`

```
dkfz-vpn136:MITK janhering$ git bisect start
dkfz-vpn136:MITK janhering$ git bisect good adaa9ecc
dkfz-vpn136:MITK janhering$ git bisect bad HEAD
Bisecting: 390 revisions left to test after this (roughly 9 steps)
[1871450c40e0de0f000ab27db10c920149884b04] Merge branch 'bug-10706-ZeroPointer'
dkfz-vpn136:MITK janhering$
```

- checkouts the middle commit

git-bisect : Search

(1) Initialize **`git bisect`**

(2) Test if bug occurs at current state

  (i) **`git bisect bad`** if yes

  (ii) **`git bisect good`** if no

(3) goto (2) if still commits remaining

(4) bad commit identified

- In case of compile errors at current state:
  - **`git bisect skip`**
  - **`git bisect good`** *<commit>*
  - **`git bisect bad`** *<older_commit>*

git-bisect : Advanced Options

- **`git bisect run`** *`<script_file>`*
  - *`<script_file>`* some executable script, exit code 0 for success, 1-127 (except 125) for failure

[example]

- Saving and replaying saved state
  - **`git bisect log >`** *`<logfile>`*
  - **`git bisect replay`** *`<logfile>`*

git-bisect : Pros/Cons

- **Pro**
  - significant speed-up for brute-force search
  - automatic run

- **Contra** (for huge projects like MITK)
  - external dependency (i.e. CTK) : can require complete superbuild
  - at some commits the project does not compile

Questions?

Thank you for your attention!