Code Readability

OSSS - Day 2

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Overview

Code Readability

A set of rules and best practices

- naming

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- general aspect = aesthetic

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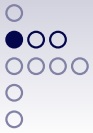
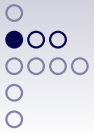
- general aspect = aesthetic
- simplify code & modularity
- commenting & documentation
- refactoring



What's in a name?

```
class BinaryTree {
  int Size();
};
```

- Size() ??



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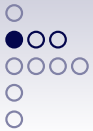
- could refer to the tree's height, number of nodes or the memory footprint on the disk



What's in a name?

```
class BinaryTree {
  int Size();
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```

- Size() ??
- could refer to the tree's height, number of nodes or the memory footprint on the disk
- use specific, descriptive words

Naming - cont

Word	**Alternatives**
send	deliver, dispatch, announce, distribute, route
find	search, extract, locate, recover
start	launch, create, begin, open
make	creat, set up, build, generate, compose, add, new

Table : Useful alternatives

Naming - cont

- avoid generic names

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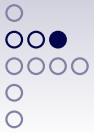
  - for example, **tmp** și **retval**



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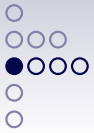
  - CamelCase: runSimpleCmd, RunSimpleCmd()
  - Hungarian notation: arru8NumberList (not recommended now)
- ... be consistent!



Aspect

```
class StatsKeeper {
public:
  void Add(double d);
private:  int count;
/* how many so far
*/ public:
  double Average();
private:  double minimum;
list<double>
  past_items
    ;double maximum;
};
```

```
class StatsKeeper {
  public:
    void Add(double d);
    double Average();
  private:
    list<double> past_items;
    // how many so far
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Aspect - cont

Indentation

- outline the flow of the code

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- K&R (see *The C Programming Language* de Kernighan & Ritchie)

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- ... and combinations of these!

Aspect - cont

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- declaring variabiles

```
a = 3, not a=3
```

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  `a = 3, not a=3`
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- tabs depend on editor, spaces same everywhere

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- commit noise

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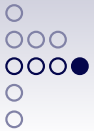
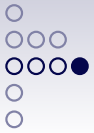
- commit noise
- positioning the cursor at the end of the line



Aspect - cont

Lines $<$ 80 characteres

- historical reasons



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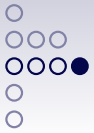

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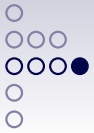

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$replacement = array('foo', 'bar', 'baz', 'quux');
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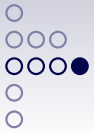

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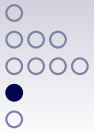
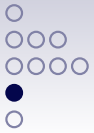
Key Word: Consistency!



Functions, simplify your code

Naming functions: concrete and descriptive!



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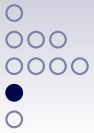

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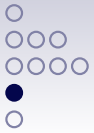

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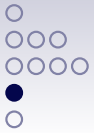

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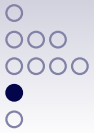

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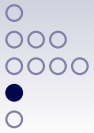

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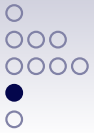

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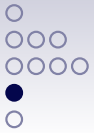

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- while (cond) ... ; vs do ... while (cond);
  - Bjarne Stroustrup: *In my experience, the do-statement is a source of errors and confusion. ... I prefer the condition "up front where I can see it." Consequently, I tend to avoid do-statements.*

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- Clear and corect
- Don't exaggerate!

```
// add the two numbers
suma = a + b;
```

Why?

- We read more code than we write

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- We're usually working in a team

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  - inside do ... while(0)
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- Include guards
- No typecast malloc in C

```
C:    char *str = malloc(256 * sizeof(char));
C++:  char *str = (char*) malloc(256 * sizeof(char)
```

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- Get reviews!

Tools

Vim

- Auto-indent:

  ```
  :set cindent
  ```

- Trailing whitespaces:

  ```
  :set list
  ```

Gprof

- profiliing = analyze execution time per blocks
- -pg flags at compilation:

  ```
  gcc example1.c -pg -o example1 -O2 -lc
  ```

- C, C++, Pascal

Lint (splint)

- spot some bugs!

Links

- Google C++ Style Guides
- Linux Kernel Coding Style
- How To Write Unmaintainable Code
- *The Art of Readable Code* by Dustin Boswell, Trevor Foucher, O'Reily Media, 2011

?