

iOS FlexBox

沈强



We Are Hiring

Index

- Why FlexBox ?
- What we have done?

Why FlexBox ?

- 统一

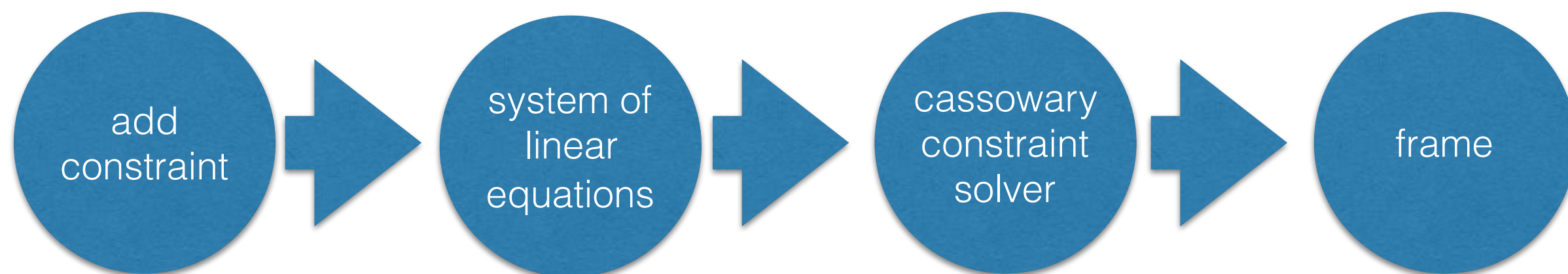
- 不爽

Frame Layout

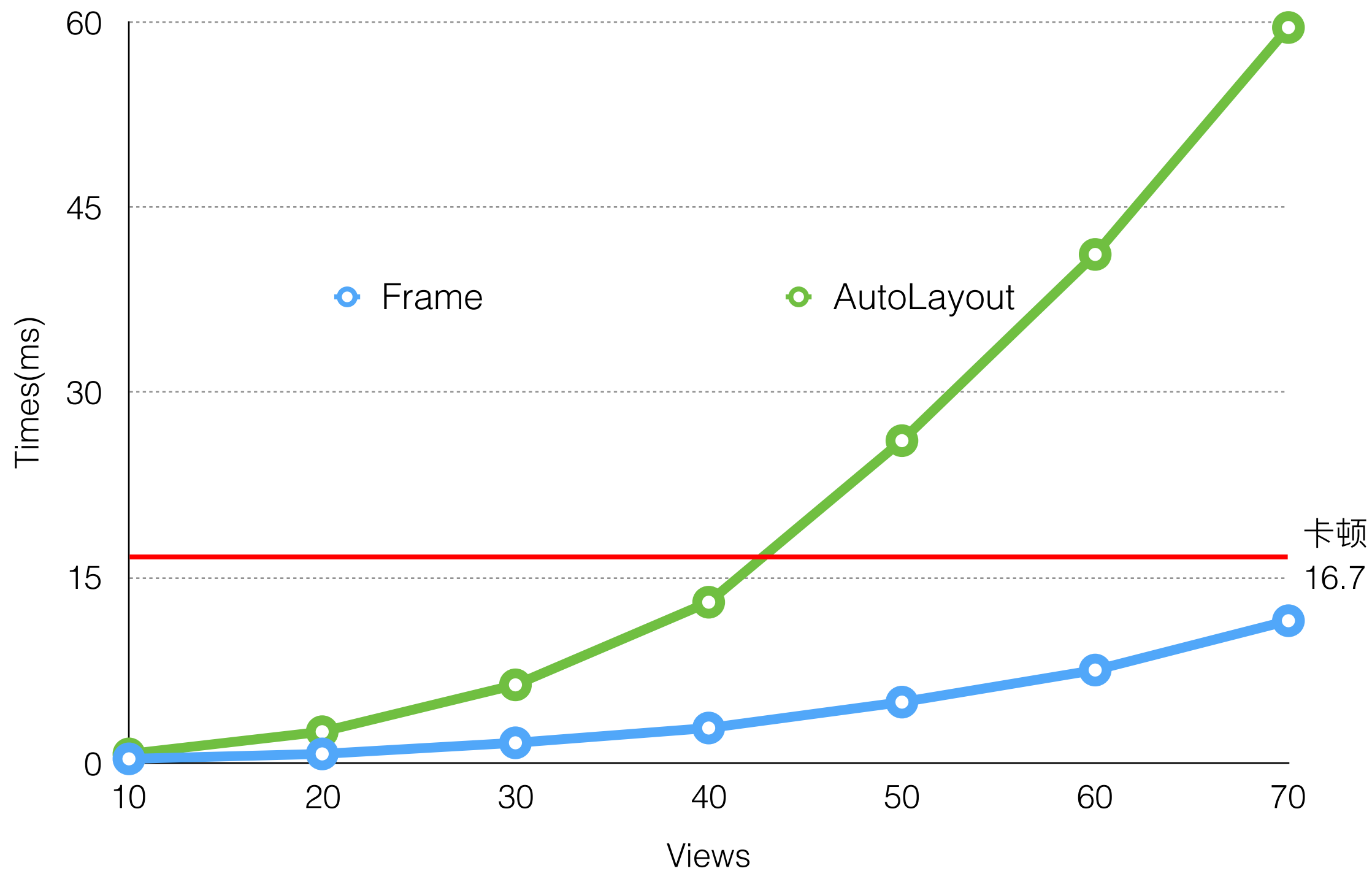
- 代码繁琐
- 不易阅读维护

Auto Layout

- 复杂布局性能问题
- Debug 不方便



Performance of Auto Layout and Frame

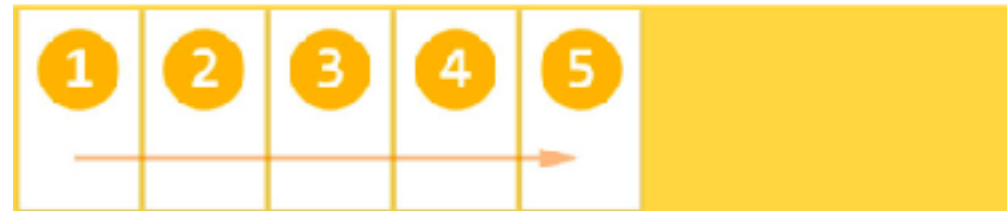


What we have done?

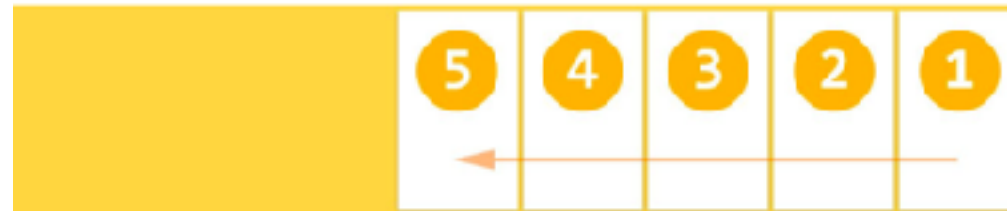
Yoga

- Flexbox container properties
 - flex-direction
 - flex-wrap
 - justify-content
 - align-items
 - align-content

`FBFlexDirectionRow;`



`FBFlexDirectionRowReverse;`



`FBFlexDirectionColumn;`



`FBFlexDirectionColumnReverse;`



FBWrapNowrap;

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

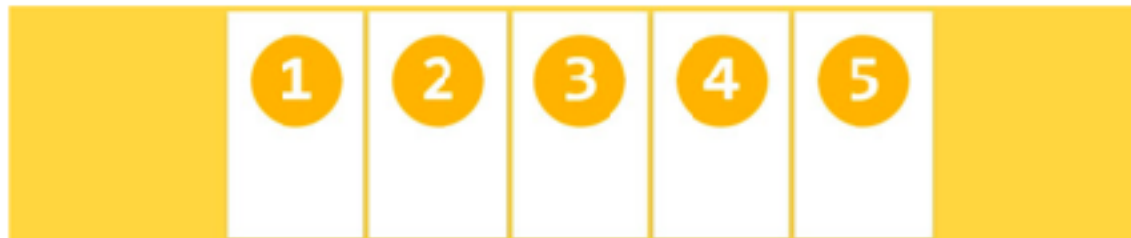
FBWrapWrap;

1	2	3	4	5	6	7	8
9	10	11	12				

`FBJustifyFlexStart;`



`FBJustifyCenter;`



`FBJustifyFlexEnd`



`FBJustifySpaceBetween;`



`FBJustifySpaceAround;`



`FBAlignFlexStart;`



`FBAlignCenter;`



`FBAlignFlexEnd;`



`FBAlignStretch;`



```
FDAlignFlexStart;
```

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20				

```
FDAlignCenter;
```

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20				

Final Ignition Point:

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20				

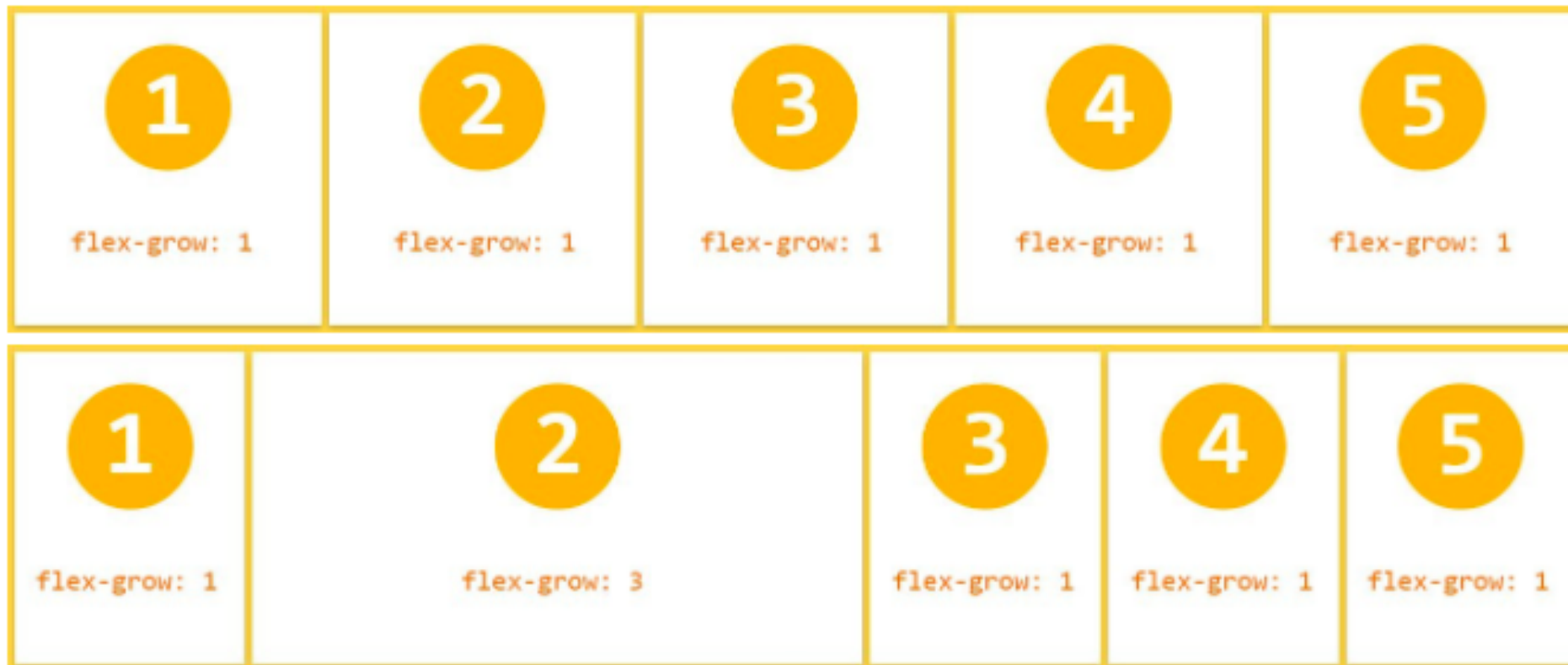
FBAlignStretch;

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20				

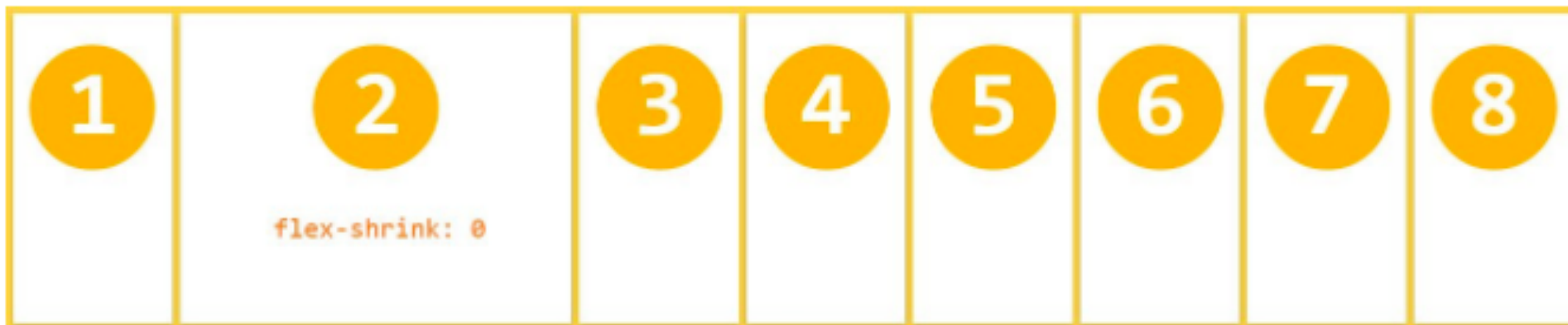
- Flexbox item properties
 - flex-grow
 - flex-shrink
 - flex-basis
 - align-self

flex-grow

FlexGrow;



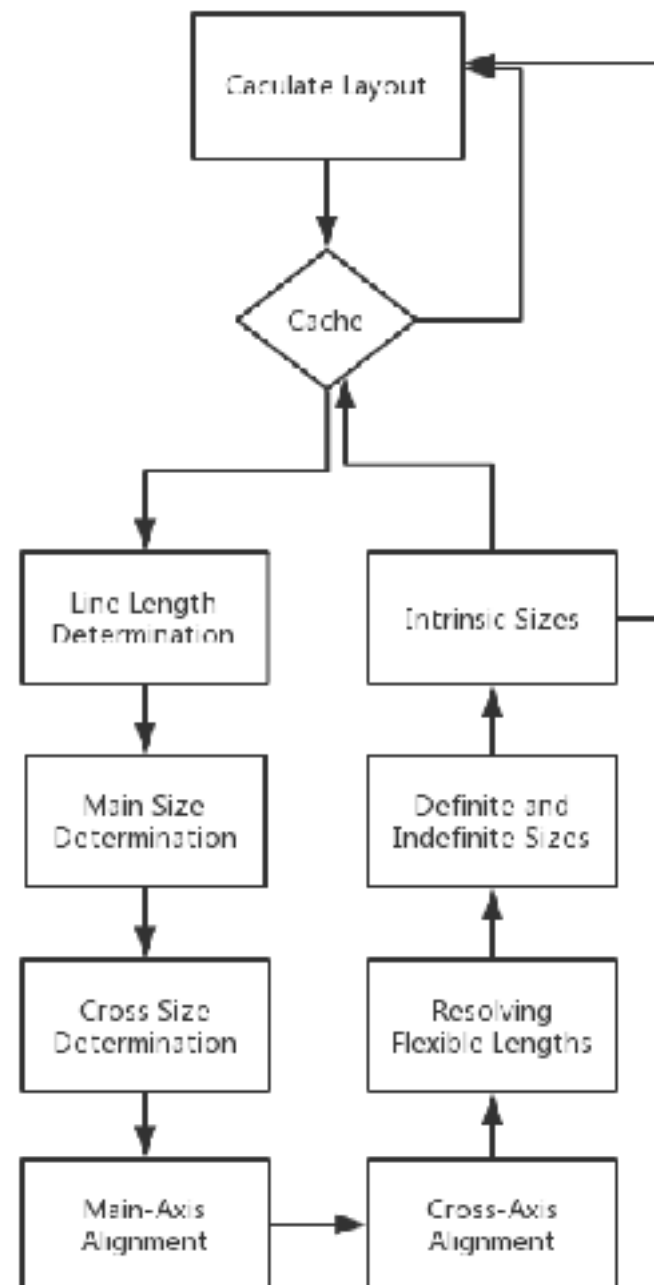
FlexShrink;



```
FlexBasis:350;
```

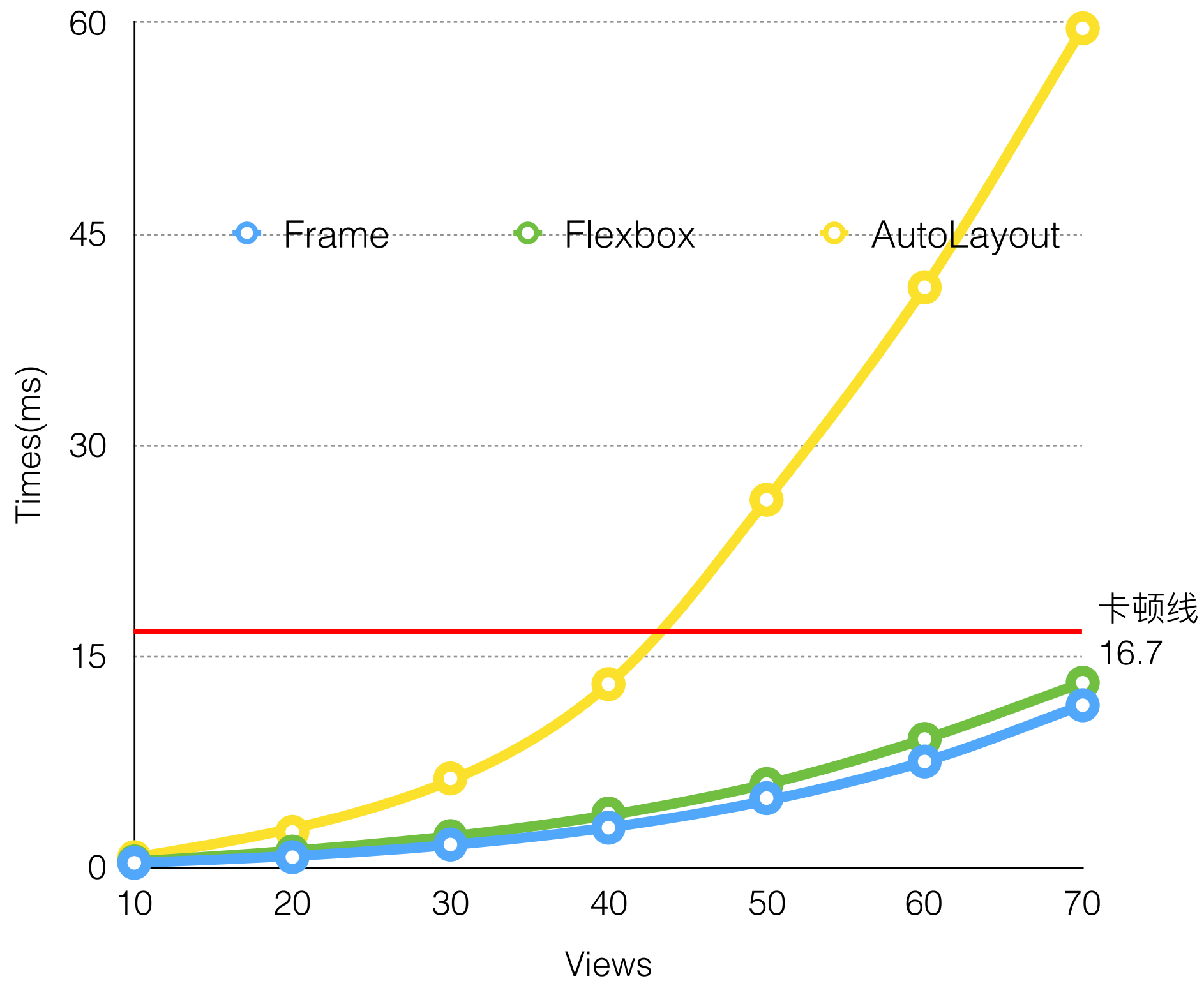






<https://www.w3.org/TR/css-flexbox-1/#layout-algorithm>

Performance of Flexbox





sinojark

2015.04.15

Team member - Phil

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team, weibo: @我就叫Sunny怎么了
Working at Baidu, Zhidao iOS team,
weibo: @我就叫Sunny怎么了Working at
Baidu, Zhidao iOS team, weibo: @我就
叫Sunny怎么了



FlexBoxLayout

CSS TableView

Chain Call

- How to layout in the cell

```

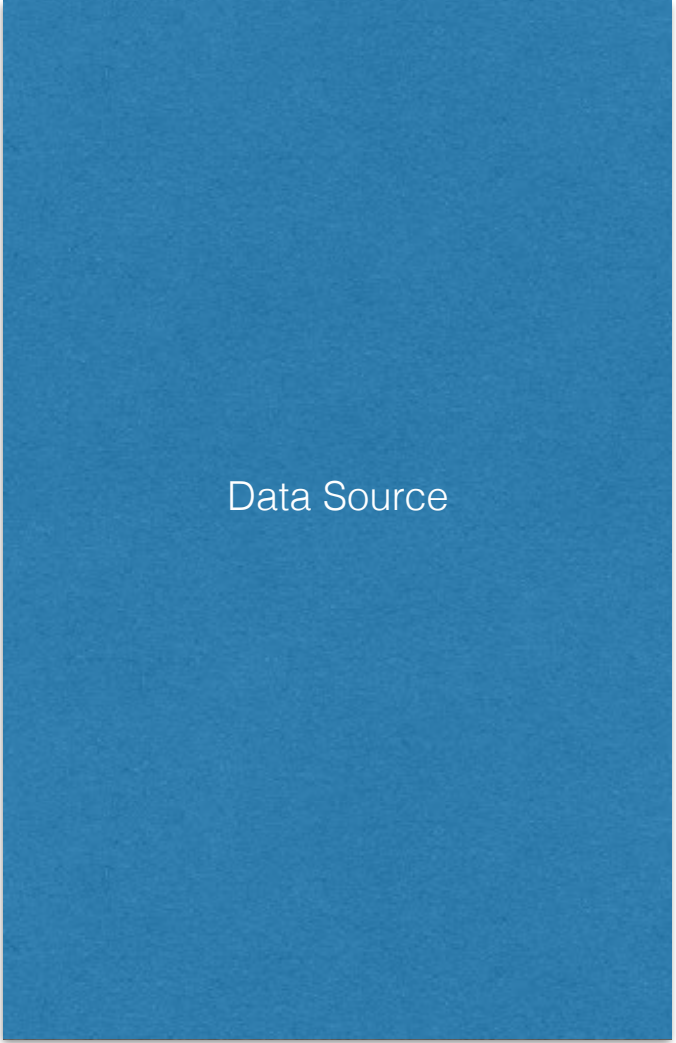
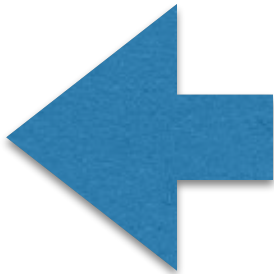
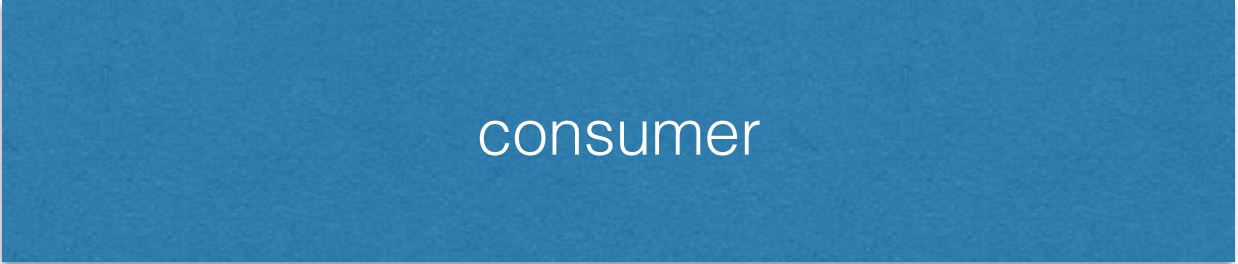
71 - (void)layoutView {
72
73     [self fb_makeLayout:^(FBLayout *layout) {
74         layout.flexDirection.equalTo(@(FBFlexDirectionColumn)).margin.equalToEdgeInsets(UIEdgeInsetsMake(0, 15, 0, 15)).alignItems.equalTo
            (@(FBAlignFlexStart));
75     }];
76
77     [_titleLabel fb_makeLayout:^(FBLayout *layout) {
78         layout.margin.equalToEdgeInsets(UIEdgeInsetsMake(10, 0, 0, 0)).wrapContent();
79     }];
80
81
82     [_contentLabel fb_makeLayout:^(FBLayout *layout) {
83         layout.margin.equalToEdgeInsets(UIEdgeInsetsMake(10, 0, 0, 0)).wrapContent();
84     }];
85
86     [_contentImageView fb_makeLayout:^(FBLayout *layout) {
87         layout.margin.equalToEdgeInsets(UIEdgeInsetsMake(10, 0, 0, 0)).wrapContent();
88     }];
89
90     [_usernameLabel fb_makeLayout:^(FBLayout *layout) {
91         layout.wrapContent().flexGrow.equalTo(@(1.0));
92     }];
93
94     [_timeLabel fb_makeLayout:^(FBLayout *layout) {
95         layout.wrapContent().flexGrow.equalTo(@(1.0));
96     }];
97
98     FBLayoutDiv *div = [FBLayoutDiv layoutDivWithFlexDirection:FBFlexDirectionRow ];
99     [div fb_makeLayout:^(FBLayout *layout) {
100         layout.flexDirection.equalTo(@(FBFlexDirectionRow)).justifyContent.equalTo(@(FBJustifySpaceBetween)).alignItems.equalTo(@(FBAlignFlexStart
            )).margin.equalToEdgeInsets(UIEdgeInsetsMake(10, 0, 0, 0));
101     }];
102     div.fb_children = @[_usernameLabel, _timeLabel];
103
104     self.fb_children = @[_titleLabel, _contentLabel, _contentImageView, div];
105 }

```

Tableview Optimization

```
[self.tableView fb_setCellContentViewBlockForIndexPath:^(UIView *(NSIndexPath *)indexPath) {  
    return [[FBFeedView alloc] initWithModel:weakSelf.sections[indexPath.section][indexPath.row]];  
}];
```

```
- (CGFloat)tableView:(UITableView *)tableView heightForRowAtIndexPath:(NSIndexPath *)indexPath {  
    return [self.tableView fb_heightForIndexPath:indexPath];  
}  
  
- (UITableViewCell *)tableView:(UITableView *)tableView cellForRowAtIndexPath:(NSIndexPath *)indexPath {  
    return [self.tableView fb_cellForIndexPath:indexPath];  
}
```



TableView Performance

4.88 s	100.0%	2.31 s	▼main FlexBoxLayout_Example
1.62 s	33.1%	1.00 ms	▶-[FBTableViewController tableView:cellForRowAtIndexPath:] FlexBoxLayout_Example
585.00 ms	11.9%	1.00 ms	▶-[FBTableViewController tableView:heightForRowAtIndexPath:] FlexBoxLayout_Example
308.00 ms	6.3%	0 s	▶0x1000a53d2 FlexBoxLayout
35.00 ms	0.7%	31.00 ms	▶-[FBFPSGraph onTick:] FlexBoxLayout_Example
7.00 ms	0.1%	1.00 ms	▶0x1000a6696 FlexBoxLayout
5.00 ms	0.1%	5.00 ms	__21-[FBFPSGraph onTick:]_block_invoke FlexBoxLayout_Example
4.00 ms	0.0%	2.00 ms	▶0x1000ac3e6 FlexBoxLayout
2.00 ms	0.0%	0 s	▶0x1000ac39e FlexBoxLayout
2.00 ms	0.0%	0 s	▶0x1000a666a FlexBoxLayout
2.00 ms	0.0%	2.00 ms	DYLD-STUB\$\$objc_storeStrong FlexBoxLayout_Example
1.00 ms	0.0%	1.00 ms	DYLD-STUB\$\$objc_msgSend FlexBoxLayout_Example
1.00 ms	0.0%	1.00 ms	0x1000a53b8 FlexBoxLayout
1.62 s	33.1%	1.00 ms	▶-[FBTableViewController tableView:cellForRowAtIndexPath:] FlexBoxLayout_Example
1.62 s	33.1%	0 s	▶0x1000aca26 FlexBoxLayout
1.33 s	27.1%	3.00 ms	▶-[FBTableViewController tableView:heightForRowAtIndexPath:] FlexBoxLayout_Example
1.26 s	25.8%	0 s	▶0x1000ac978 FlexBoxLayout
1.12 s	23.0%	0 s	▶0x1000acffa FlexBoxLayout
986.00 ms	20.2%	0 s	▶0x1000a6f36 FlexBoxLayout
986.00 ms	20.2%	0 s	▶0x1000b085e FlexBoxLayout
983.00 ms	20.1%	0 s	▶0x1000b88de FlexBoxLayout
980.00 ms	20.0%	0 s	▶0x1000b8378 FlexBoxLayout

before

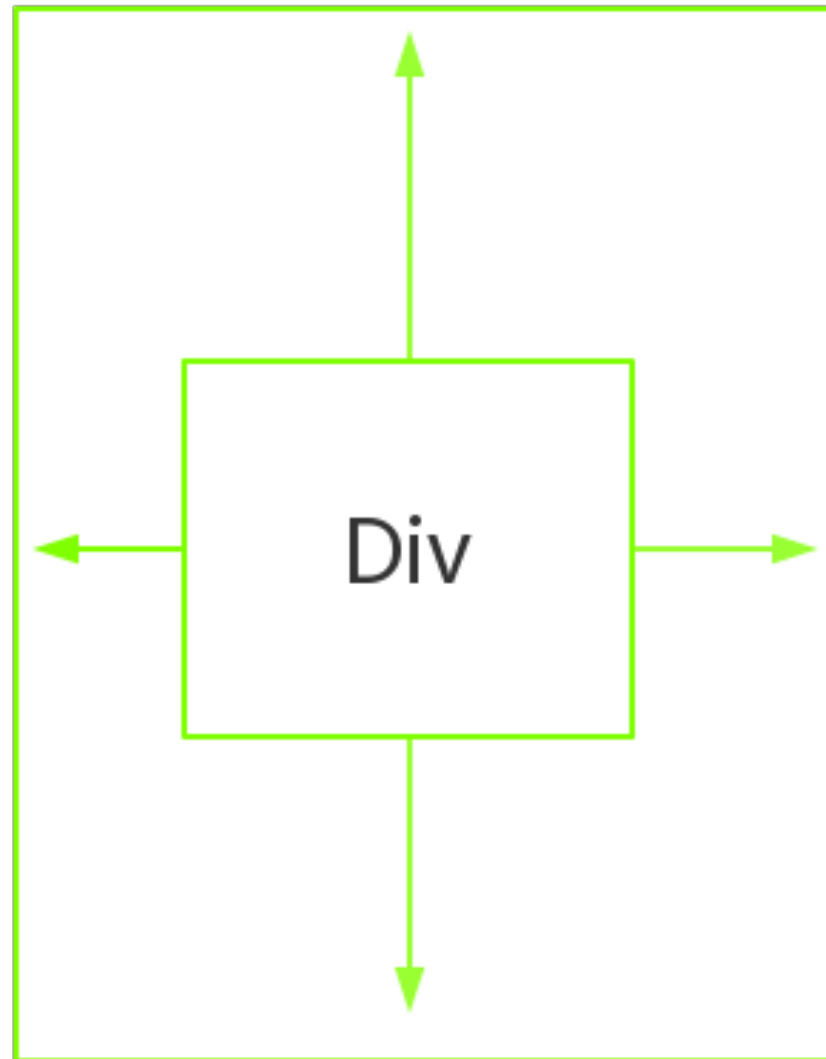
2.86 s	100.0%	0 s	▼Main Thread 0x8057b
2.86 s	100.0%	2.18 s	▼main FlexBoxLayout_Example
348.00 ms	12.1%	0 s	▶-[FBTableViewController tableView:cellForRowAtIndexPath:] FlexBoxLayout_Example
294.00 ms	10.2%	0 s	▶0x1000c4ec6 FlexBoxLayout
27.00 ms	0.9%	23.00 ms	▶-[FBFPSGraph onTick:] FlexBoxLayout_Example
6.00 ms	0.2%	4.00 ms	▶-[FBTableViewController tableView:heightForRowAtIndexPath:] FlexBoxLayout_Example ➕
6.00 ms	0.2%	5.00 ms	▶_21-[FBFPSGraph onTick:]_block_invoke FlexBoxLayout_Example
2.00 ms	0.0%	2.00 ms	CYLD-STUB\$\$objc_msgSend FlexBoxLayout_Example
1.00 ms	0.0%	1.00 ms	CYLD-STUB\$\$objc_storeStrong FlexBoxLayout_Example
1.00 ms	0.0%	1.00 ms	CYLD-STUB\$\$objc_retainAutoreleasedReturnValue FlexBoxLayout_Example
1.00 ms	0.0%	1.00 ms	_destroy_helper_block_ FlexBoxLayout_Example
348.00 ms	12.1%	0 s	▶-[FBTableViewController tableView:cellForRowAtIndexPath:] FlexBoxLayout_Example
345.00 ms	12.0%	0 s	▼0x1000cc51a FlexBoxLayout
180.00 ms	6.2%	0 s	▶0x1000cc8de FlexBoxLayout
159.00 ms	5.5%	152.00 ms	▶0x1000cc7de FlexBoxLayout
1.00 ms	0.0%	1.00 ms	0x1000cc8aa FlexBoxLayout
1.00 ms	0.0%	1.00 ms	0x1000cc8fa FlexBoxLayout
1.00 ms	0.0%	1.00 ms	0x1000cc85e FlexBoxLayout
1.00 ms	0.0%	0 s	▶0x1000cc7fe FlexBoxLayout
1.00 ms	0.0%	0 s	▶0x1000cc822 FlexBoxLayout
1.00 ms	0.0%	1.00 ms	0x1000cc83e FlexBoxLayout
294.00 ms	10.2%	0 s	▶0x1000c52f2 FlexBoxLayout
294.00 ms	10.2%	0 s	▶0x1000c4ec6 FlexBoxLayout
202.00 ms	7.0%	195.00 ms	▶0x1000c5366 FlexBoxLayout ➕
180.00 ms	6.2%	0 s	▶0x1000cc8de FlexBoxLayout
159.00 ms	5.5%	152.00 ms	▶0x1000cc7de FlexBoxLayout
117.00 ms	4.0%	117.00 ms	0x1000cdbde FlexBoxLayout
62.00 ms	2.1%	62.00 ms	0x1000cdb42 FlexBoxLayout
59.00 ms	2.0%	58.00 ms	▶0x1000c538a FlexBoxLayout
27.00 ms	0.9%	23.00 ms	▶-[FBFPSGraph onTick:] FlexBoxLayout_Example
13.00 ms	0.4%	0 s	▶0x1000c53fa FlexBoxLayout
12.00 ms	0.4%	7.00 ms	▶-[FBTableViewController tableView:heightForRowAtIndexPath:] FlexBoxLayout_Example ➕
7.00 ms	0.2%	6.00 ms	▶0x1000c5342 FlexBoxLayout
6.00 ms	0.2%	5.00 ms	▶_21-[FBFPSGraph onTick:]_block_invoke FlexBoxLayout_Example

after

ScrollView

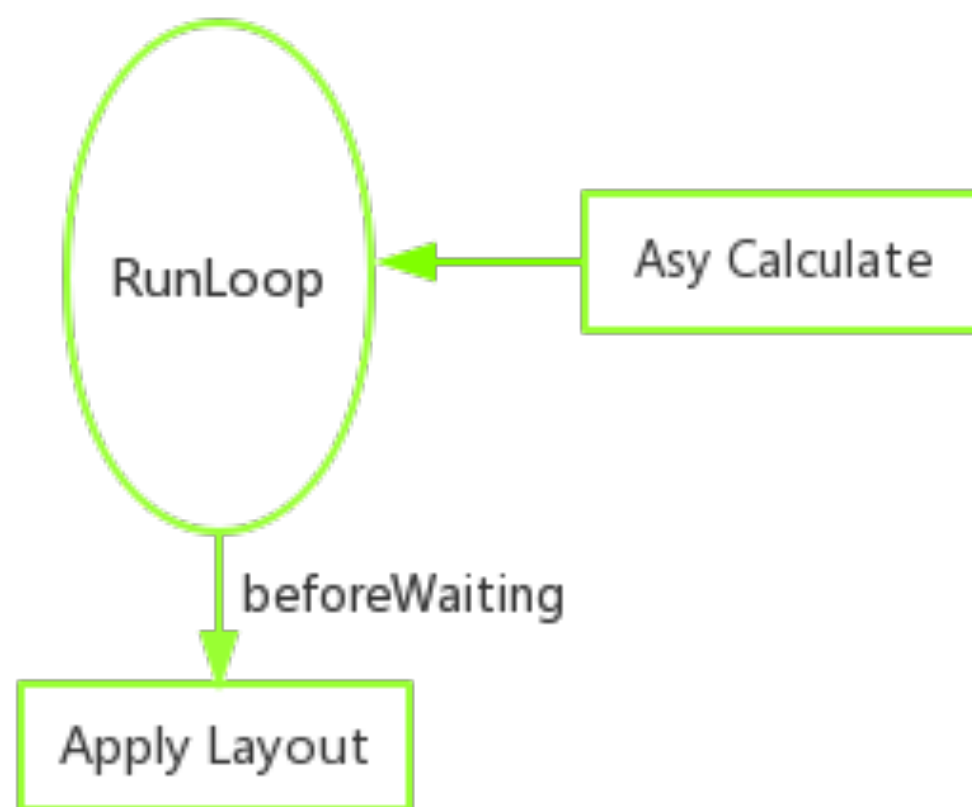
```
FBLayoutDiv *root = [FBLayoutDiv layoutDivWithFlexDirection:FBFlexDirectionRow
                                justifyContent:FBJustifySpaceAround
                                alignItems:FBAlignCenter
                                children:@[div1,div2]];

contentView.fb_contentDiv = root;
```



Asy Calculate

```
[root fb_asyApplyLayoutWithSize:[UIScreen mainScreen].bounds.size];  
  
[FBAsyLayoutTransaction addCalculateTransaction:^(  
    ...  
} complete:^(  
    ...  
})];
```



Q & A?