

# Don't reset --hard: Strategies for Tackling Large Refactors

Siena Aguayo  
Software Engineer, Indiegogo  
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Slides: <http://tinyurl.com/siena-refactoring>

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Has this ever  
happened to you?

```
void openPerkDescription() {
    rotateToUp =
        new RotateAnimation(0, -180, Animation.RELATIVE_TO_SELF, 0.5f);
    rotateToUp.setFillAfter(true);
    rotateToUp.setDuration(duration);

    TextView getPerkButton = viewHolder.getPerkButton();
    Perk perk = (Perk) getPerkButton.getTag();
    TextView perkCarrot = viewHolder.getPerkCarrot();
    final TextView perkDescription = viewHolder.getPerkDescription();

    perk.setOpen(true);
    perkCarrot.startAnimation(rotateToUp);
    perkCarrot.setAlpha(0f);
    perkDescription.setVisibility(View.VISIBLE);
    perkDescription.animate().setDuration(duration);
}

void setContributionAvatarAmount(ContributionRow.ViewHolder viewHolder, Picasso picasso) {
    if (contribution.getAmount() != null) {
        viewHolder.getContributionAmount().setVisibility(View.VISIBLE);
        viewHolder.getContributionAmount().setText("%1$s%2$s", campaign.getCurrency().getSymbol(), contribution.getAmount());
        viewHolder.getContributionAmount().setTypeface(Archer.getInstance().getIggyFonts().get(contribution.isPrivate()));
        if (contribution.isPrivate()) {
            viewHolder.getContributionAmount().setTextColor(res.getColor(R.color.private));
        } else {
            viewHolder.getContributionAmount().setTextColor(res.getColor(R.color.public));
        }
    } else {
        viewHolder.getContributionAmount().setVisibility(View.GONE);
    }
}

void openPerkDescription() {
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}
```

```
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        viewHolder.getContributionAmount().setTypeface(Archer.getInstance().getIggyFonts().get(contribution.isPrivate()));
        if (contribution.isPrivate()) {
            viewHolder.getContributionAmount().setTextColor(res.getColor(R.color.private));
        } else {
            viewHolder.getContributionAmount().setTextColor(res.getColor(R.color.public));
        }
    } else {
        viewHolder.getContributionAmount().setVisibility(View.GONE);
    }
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    perkCarrot.startAnimation(rotateToUp);
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        viewHolder.getContributionAmount().setText("%1$s%2$s", campaign.getCurrency().getSymbol(), contribution.getAmount());
        viewHolder.getContributionAmount().setTypeface(Archer.getInstance().getIggyFonts().get(contribution.isPrivate()));
        if (contribution.isPrivate()) {
            viewHolder.getContributionAmount().setTextColor(res.getColor(R.color.private));
        } else {
            viewHolder.getContributionAmount().setTextColor(res.getColor(R.color.public));
        }
    } else {
        viewHolder.getContributionAmount().setVisibility(View.GONE);
    }
}

void openPerkDescription() {
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```
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        new RotateAnimation(0, -180, Animation.RELATIVE_TO_SELF, 0.5f);
    rotateToUp.setFillAfter(true);
    rotateToUp.setDuration(duration);

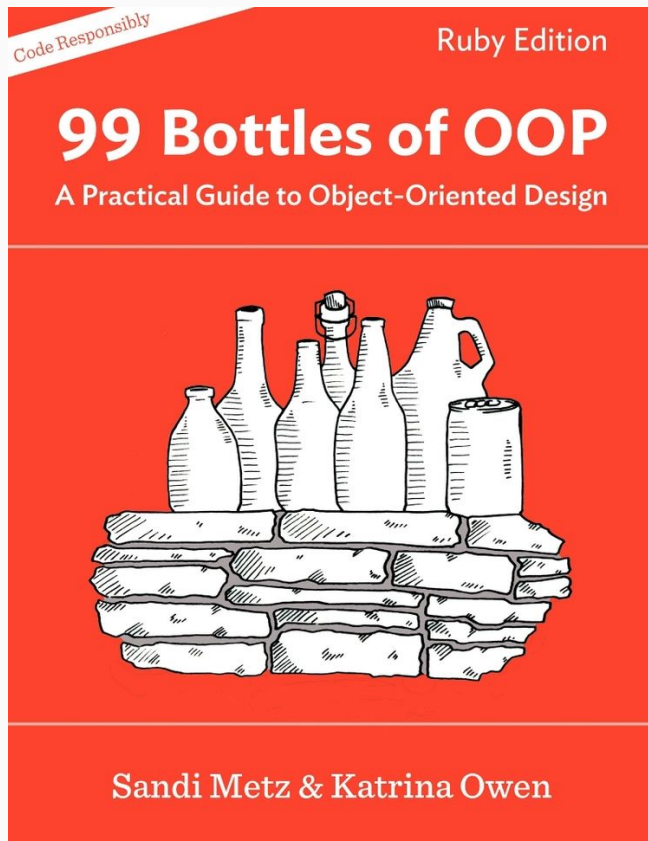
    TextView getPerkButton = viewHolder.getPerkButton();
    Perk perk = (Perk) getPerkButton.getTag();
    TextView perkCarrot = viewHolder.getPerkCarrot();
    final TextView perkDescription = viewHolder.getPerkDescription();

    perk.setOpen(true);
    perkCarrot.startAnimation(rotateToUp);
    perkCarrot.setAlpha(0f);
    perkDescription.setVisibility(View.VISIBLE);
    perkDescription.animate().setDuration(duration);
}
```

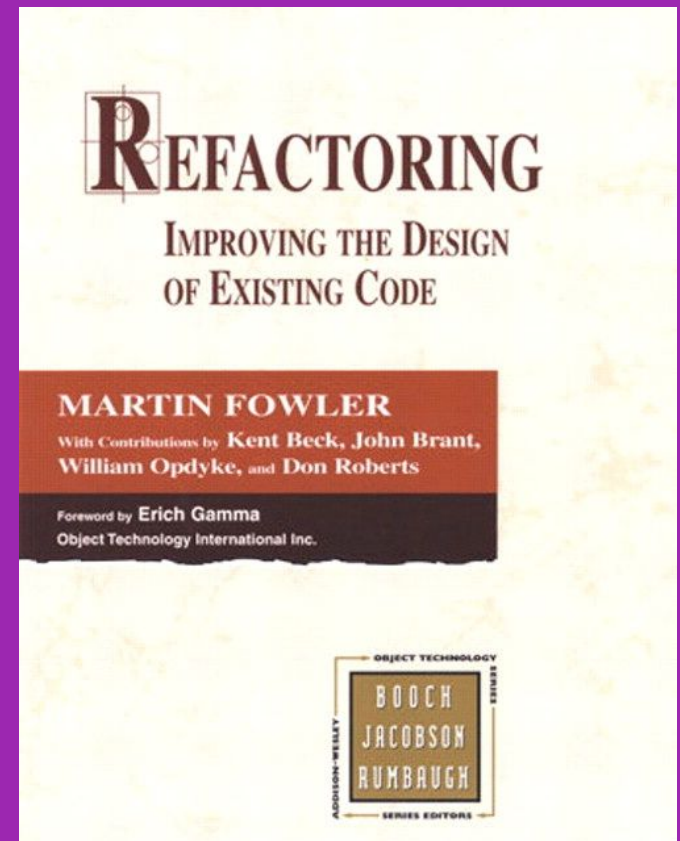
ooo

```
$ git reset --hard origin/master
```

What if I told you  
there was  
another way?



<https://www.sandimetz.com/99bottles>



Available on Amazon

# Why refactor?



# When to refactor?

# Refactoring Strategy

1. Discover

2. Change

3. Test

4. Repeat

This strategy is not a replacement for an architectural plan.

Rather, it helps you  
move smoothly  
towards your goal.

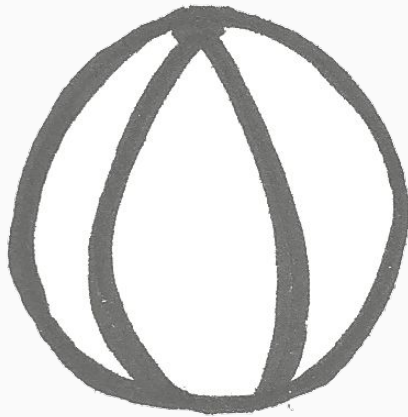
# 1. Discover

Identify the code you wish to change.

If you're not sure where to start, follow your nose (code smells).

# 1. Discover

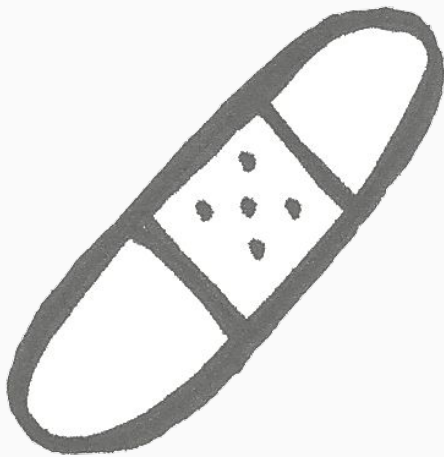
## Code Smells: Bloaters



- Long Method
- Large Class
- Primitive Obsession
- Long Parameter List
- Data Clumps

## 1. Discover

# Code Smells: Object-Orientation Abusers

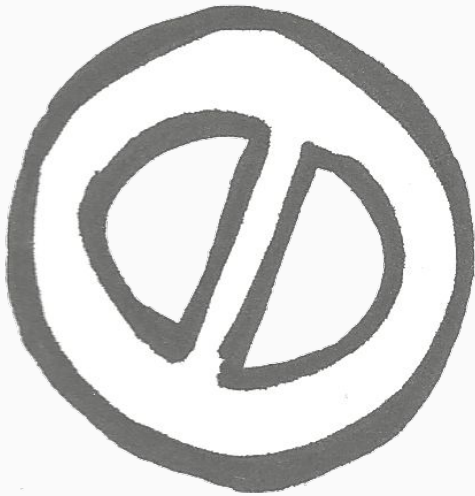


- Switch Statements
- Temporary Field
- Refused Bequest
- Alternative Classes with Different Interfaces



## 1. Discover

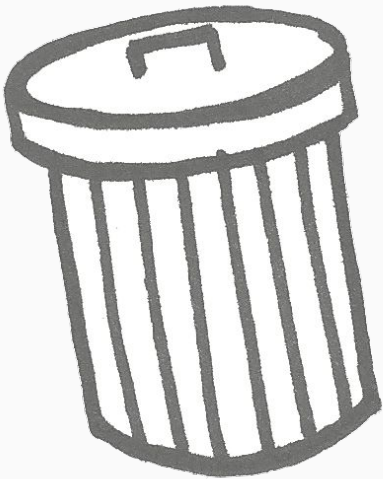
# Code Smells: Change Preventers



- Divergent Change
- Shotgun Surgery
- Parallel Inheritance Hierarchies

# 1. Discover

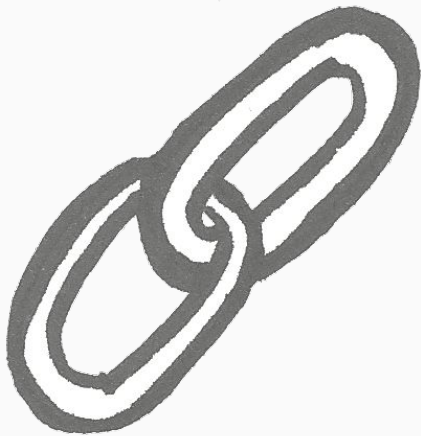
## Code Smells: Dispensables



- Lazy Class
- Data Class
- Duplicated Code
- Dead Code
- Speculative Generality
- Comments

# 1. Discover

## Code Smells: Couplers



- Feature Envy
- Inappropriate Intimacy
- Message Chains
- Middle Man

## 2. Change

Change the *smallest* possible thing at a time.

Even smaller than you might be used to.

## 3. Test

Run your tests, if you have them.

At the very least, make sure your code compiles.

If your tests don't pass, you need to make a different change.

If you don't have test coverage and suddenly you've made it easier to write tests, stop and write them.

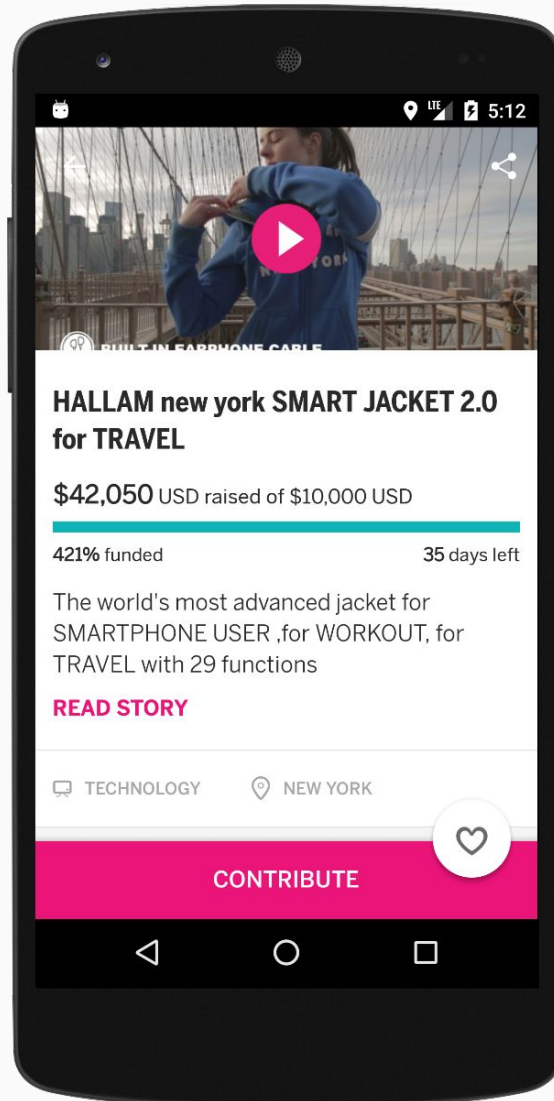
## 4. Repeat

Be “safe and bored” when refactoring.

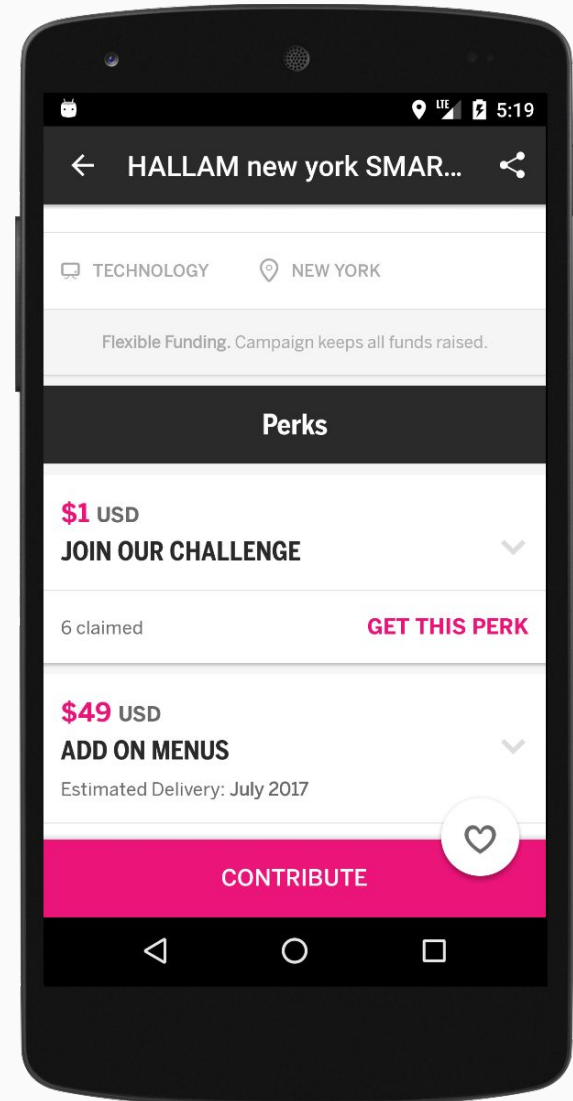
Don’t skip steps until you build confidence in the method.

# Applying the Strategy

## Campaign



## Perks





# Our Finished View: Perks

## Active

**\$35 USD**

**Available on Blu-Ray and DVD**

Estimated Delivery: February 2018

1109 claimed

**GET THIS PERK**

## Sold Out

**\$45 USD**

**EARLY BIRD: Pins -Full Set**

Estimated Delivery: July 2017

100 of 100 claimed

**SOLD OUT**

## Ended

**\$375 USD**

**Distributor Pack**

Estimated Delivery: September 2017

12 claimed

**ENDED**

# Our Finished View: Perk Buttons

Active

**GET THIS PERK**

Sold Out

**SOLD OUT**

Ended

**ENDED**

# Model-View-ViewModel

**Model:** contains the data that is actually going to go into your view, e.g. the text that will go on a button. Ideally is just a dumb data holder.

**View:** something that inherits from the Android Framework's View, e.g. the button itself.

**ViewModel:** the class in charge of taking data from the model and assigning it to the view.

```
// ApplicationHelper.java
237 public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
238     Campaign campaign, Context context, String googleAnalyticsAction) {
239     boolean isSoldOut =
240         perk.getNumberAvailable() != null && perk.getNumberClaimed() >= perk.getNumberAvailable();
241     float alpha = 1f;
242     TextView perkButton = viewHolder.getPerkButton();
243     perkButton.setTag(perk);
244     if (campaign.getStatus().equals("published")) {
245         if (!isSoldOut) {
246             perkButton.setOnClickListener(
247                 Listeners.getPerkListener(campaign, (FragmentTransactingActivity) context,
248                     googleAnalyticsAction));
249             perkButton.setText(res.getString(R.string.get_perk));
250             perkButton.setTextColor(res.getColor(R.color.gogenta));
251             perkButton.setClickable(true);
252         } else {
253             alpha = 0.6f;
254             perkButton.setText(res.getString(R.string.sold_out));
255             perkButton.setTextColor(res.getColor(R.color.audi_grey));
256             perkButton.setClickable(false);
257         }
258     } else {
259         alpha = 0.6f;
260         perkButton.setText(res.getString(R.string.ended));
261         perkButton.setTextColor(res.getColor(R.color.batman_grey));
262         perkButton.setClickable(false);
263     }
264
265     perkButton.setAlpha(alpha);
266     viewHolder.getPerkAmount().setAlpha(alpha);
267     viewHolder.getPerkTitle().setAlpha(alpha);
... // another 40 lines of code
```

```
// ApplicationHelper.java
237 public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
238     Campaign campaign, Context context, String googleAnalyticsAction) {
239     boolean isSoldOut =
240         perk.getNumberAvailable() != null && perk.getNumberClaimed() >= perk.getNumberAvailable();
241     float alpha = 1f;
242     TextView perkButton = viewHolder.getPerkButton();
243     perkButton.setTag(perk);
244     if (campaign.getStatus().equals("published")) {
245         if (!isSoldOut) {
246             perkButton.setOnClickListener(
247                 Listeners.getPerkListener(campaign, (FragmentTransactingActivity) context,
248                     googleAnalyticsAction));
249             perkButton.setText(res.getString(R.string.get_perk));
250             perkButton.setTextColor(res.getColor(R.color.gogenta));
251             perkButton.setClickable(true);
252         } else {
253             alpha = 0.6f;
254             perkButton.setText(res.getString(R.string.sold_out));
255             perkButton.setTextColor(res.getColor(R.color.audi_grey));
256             perkButton.setClickable(false);
257         }
258     } else {
259         alpha = 0.6f;
260         perkButton.setText(res.getString(R.string.ended));
261         perkButton.setTextColor(res.getColor(R.color.batman_grey));
262         perkButton.setClickable(false);
263     }
264
265     perkButton.setAlpha(alpha);
266     viewHolder.getPerkAmount().setAlpha(alpha);
267     viewHolder.getPerkTitle().setAlpha(alpha);
268     ... // another 40 lines of code
```

## 2. Change

@sienatime #droidconbos

```
// PerkViewModel.java
1 public final class PerkViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalytics) {
4         ...
54     if (perk.isOpen()) {
55         openPerkDescription(viewHolder, 0, alpha);
56     } else {
57         closePerkDescription(viewHolder, 0);
58     }
59     viewHolder.getPerkDescription().setText(perk.getDescription());
60
61     setTextViewDateWithFormatArgs(viewHolder.getEstimatedDelivery(),
62         res.getString(R.string.estimated_delivery_campaign_perk), perk.getEstimatedDeliveryDate());
63
64     TextView perksClaimed = viewHolder.getPerksClaimed();
65     if (perk.getNumberAvailable() != null) {
66         ApplicationHelper.setTextViewWithPluralFormatArgs(res, perksClaimed,
67             R.plurals.claimed_of_limited, perk.getNumberClaimed(), perk.getNumberClaimed(),
68             perk.getNumberAvailable());
69     } else {
70         ApplicationHelper.setTextViewWithPluralFormatArgs(res, perksClaimed,
71             R.plurals.claimed_of_unlimited, perk.getNumberClaimed(), perk.getNumberClaimed());
72     }
73     setTextViewWithFormatArgs(viewHolder.getPerkAmount(), R.string.perk_amount,
74         campaign.getCurrency().getSymbol(), numberFormat.format(perk.getAmount()),
75         campaign.getCurrency().getIsoCode());
76 }
77 }
```

## 2. Change

@sienatime #droidconbos

```
// PerksViewModel.java
1 public final class PerksViewModel {
2     public static void setPerksView(Resources res, PerksRow.ViewHolder viewHolder, Perks perk,
3         Campaign campaign, Context context, String googleAnalytics) {
4         ...
54         if (perk.isOpen()) {
55             openPerksDescription(viewHolder, 0, alpha);
56         } else {
57             closePerksDescription(viewHolder, 0);
58         }
59         viewHolder.getPerksDescription().setText(perk.getDescription());
60
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62             res.getString(R.string.estimated_delivery_campaign_perk), perk.getEstimatedDeliveryDate());
63
64         TextView perksClaimed = viewHolder.getPerksClaimed();
65         if (perk.getNumberAvailable() != null) {
66             ApplicationHelper.setTextViewWithPluralFormatArgs(res, perksClaimed,
67                 R.plurals.claimed_of_limited, perk.getNumberClaimed(), perk.getNumberClaimed(),
68                 perk.getNumberAvailable());
69         } else {
70             ApplicationHelper.setTextViewWithPluralFormatArgs(res, perksClaimed,
71                 R.plurals.claimed_of_unlimited, perk.getNumberClaimed(), perk.getNumberClaimed());
72         }
73         setTextViewWithFormatArgs(viewHolder.getPerksAmount(), R.string.perks_amount,
74             campaign.getCurrency().getSymbol(), numberFormat.format(perk.getAmount()),
75             campaign.getCurrency().getIsoCode());
76     }
77 }
```

## 2. Change

@sienatime #droidconbos

```
// PerViewModel.java
1 public final class PerViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalytics) {
4         ...
54         if (perk.isOpen()) {
55             ApplicationHelper.openPerkDescription(viewHolder, 0, alpha);
56         } else {
57             ApplicationHelper.closePerkDescription(viewHolder, 0);
58         }
59         viewHolder.getPerkDescription().setText(perk.getDescription());
60
61         ApplicationHelper.setTextViewDateWithFormatArgs(viewHolder.getEstimatedDelivery(),
62             res.getString(R.string.estimated_delivery_campaign_perk), perk.getEstimatedDeliveryDate());
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64         TextView perksClaimed = viewHolder.getPerksClaimed();
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71                 R.plurals.claimed_of_unlimited, perk.getNumberClaimed(), perk.getNumberClaimed());
72         }
73         ApplicationHelper.setTextViewWithFormatArgs(viewHolder.getPerkAmount(), R.string.perk_amount,
74             campaign.getCurrency().getSymbol(), NumberFormat.getInstance().format(perk.getAmount()),
75             campaign.getCurrency().getIsoCode());
76     }
77 }
```



## 2. Change

@sienatime #droidconbos

```
// ApplicationHelper.java
237 public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
238     Campaign campaign, Context context, String googleAnalyticsAction) {
239     PerkViewModel.setPerkView(res, viewHolder, perk, campaign, context, googleAnalyticsAction);
240 }
```



```
// PerableViewModel.java
1 public final class PerableViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalyticsAction) {
4         float alpha = 1f;
5         TextView perkButton = viewHolder.getPerkButton();
6         perkButton.setTag(perk);
7         if (campaign.getStatus().equals("published")) {
8             if (!perk.isSoldOut()) {
9                 perkButton.setOnClickListener(
10                     Listeners.getPerkListener(campaign, (FragmentTransactingActivity) context,
11                         googleAnalyticsAction));
12                 perkButton.setText(res.getString(R.string.get_perk));
13                 perkButton.setTextColor(res.getColor(R.color.gogenta));
14                 perkButton.setClickable(true);
15             } else {
16                 alpha = 0.6f;
17                 perkButton.setText(res.getString(R.string.sold_out));
18                 perkButton.setTextColor(res.getColor(R.color.audi_grey));
19                 perkButton.setClickable(false);
20             }
21         } else {
22             alpha = 0.6f;
23             perkButton.setText(res.getString(R.string.ended));
24             perkButton.setTextColor(res.getColor(R.color.batman_grey));
25             perkButton.setClickable(false);
26         }
27
28         perkButton.setAlpha(alpha);
29
30         viewHolder.getPerkAmount().setAlpha(alpha);
31         viewHolder.getPerkTitle().setAlpha(alpha);
32         viewHolder.getPerkDescription().setAlpha(alpha);
33         viewHolder.getPerksClaimed().setAlpha(alpha);

```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
2     private TextView view;
3
4     PerkButtonViewModel(TextView view) {
5         this.view = view;
6     }
7 }
```

## 2. Change

@sienatime #droidconbos

```
// PerableViewModel.java
1 public final class PerableViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalyticsAction) {
4         float alpha = 1f;
5         TextView perkButton = viewHolder.getPerkButton();
6         perkButton.setTag(perk);
7         if (campaign.getStatus().equals("published")) {
8             if (!perk.isSoldOut()) {
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10                     Listeners.getPerkListener(campaign, (FragmentTransactingActivity) context,
11                         googleAnalyticsAction));
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18                 perkButton.setTextColor(res.getColor(R.color.audi_grey));
19                 perkButton.setClickable(false);
20             }
21         } else {
22             alpha = 0.6f;
23             perkButton.setText(res.getString(R.string.ended));
24             perkButton.setTextColor(res.getColor(R.color.batman_grey));
25             perkButton.setClickable(false);
26         }
27
28         perkButton.setAlpha(alpha);
29
30         PerkButtonViewModel perkButtonViewModel = new PerkButtonViewModel(perkButton);
```



```
// PerableViewModel.java
1 public final class PerableViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalyticsAction) {
4         float alpha = 1f;
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6         perkButton.setTag(perk);
7         if (campaign.getStatus().equals("published")) {
8             if (!perk.isSoldOut()) {
9                 perkButton.setOnClickListener(
10                     Listeners.getPerkListener(campaign, (FragmentTransactingActivity) context,
11                         googleAnalyticsAction));
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13                 perkButton.setTextColor(res.getColor(R.color.gogenta));
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19                 perkButton.setClickable(false);
20             }
21         } else {
22             alpha = 0.6f;
23             perkButton.setText(res.getString(R.string.ended));
24             perkButton.setTextColor(res.getColor(R.color.batman_grey));
25             perkButton.setClickable(false);
26         }
27
28         perkButton.setAlpha(alpha);
29
30         PerkButtonViewModel perkButtonViewModel = new PerkButtonViewModel(perkButton);
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
2     private TextView view;
3     private Campaign campaign;
4     private Perk perk;
5     private FragmentTransactingActivity context;
6     private String googleAnalyticsAction;
7     private Resources res;
8
9     PerkButtonViewModel(TextView view, Campaign campaign, Perk perk,
10         FragmentTransactingActivity context, String googleAnalyticsAction, Resources res) {
11         this.view = view;
12         this.campaign = campaign;
13         this.perk = perk;
14         this.context = context;
15         this.googleAnalyticsAction = googleAnalyticsAction;
16         this.res = res;
17     }
18
19     void populateView() {
20         float alpha = 1f;
21         view.setTag(perk);
22         if (campaign.getStatus().equals("published")) {
23             if (!perk.isSoldOut()) {
24                 view.setOnClickListener(
25                     Listeners.getPerkListener(campaign, context,
26                         googleAnalyticsAction));
27                 view.setText(res.getString(R.string.get_perk));
28                 view.setTextColor(res.getColor(R.color.gogenta));
29                 view.setClickable(true);
30             } else {
31                 alpha = 0.6f;
32                 view.setText(res.getString(R.string.sold_out));
33             }
34         }
35     }
36 }
```

...



## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
9     private float alpha;
10
11     PerkButtonViewModel(Textview view, Campaign campaign, Perk perk,
12         FragmentTransactingActivity context, String googleAnalyticsAction, Resources res) {
...
19     }
20
21     public float getAlpha() {
22         return this.alpha;
23     }
24
25     void populateView() {
26         alpha = 1f;
27         view.setTag(perk);
28         if (campaign.getStatus().equals("published")) {
29             if (!perk.isSoldOut()) {
30                 view.setOnClickListener(
31                     Listeners.getPerkListener(campaign, context,
32                         googleAnalyticsAction));
33                 view.setText(res.getString(R.string.get_perk));
34                 view.setTextColor(res.getColor(R.color.gogenta));
35                 view.setClickable(true);
36             } else {
37                 alpha = 0.6f;
38                 view.setText(res.getString(R.string.sold_out));
39                 view.setTextColor(res.getColor(R.color.audi_grey));
40                 view.setClickable(false);
41             }
42         } else {
43             alpha = 0.6f;
...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerableViewModel.java
1 public final class PerableViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalyticsAction) {
4         PerkJButtonViewModel perkButtonViewModel =
5             new PerkJButtonViewModel(viewHolder.getPerkJButton(), campaign, perk,
6                 (FragmentTransactingActivity) context, googleAnalyticsAction, res);
7         perkButtonViewModel.populateView();
8         float alpha = perkButtonViewModel.getAlpha();
9
10        viewHolder.getPerkJAmount().setAlpha(alpha);
11        viewHolder.getPerkJTitle().setAlpha(alpha);
12        viewHolder.getPerkJDescription().setAlpha(alpha);
13        viewHolder.getPerksClaimed().setAlpha(alpha);
14        viewHolder.getEstimatedDelivery().setAlpha(alpha);
15        ...
16    }
17 }
```



```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     alpha = 1f;
27     view.setTag(perk);
28     if (campaign.getStatus().equals("published")) {
29         if (!perk.isSoldOut()) {
30             view.setOnClickListener(
31                 Listeners.getPerkListener(campaign, context, googleAnalyticsAction));
32             view.setText(res.getString(R.string.get_perk));
33             view.setTextColor(res.getColor(R.color.gogenta));
34             view.setClickable(true);
35         } else {
36             alpha = 0.6f;
37             view.setText(res.getString(R.string.sold_out));
38             view.setTextColor(res.getColor(R.color.audi_grey));
39             view.setClickable(false);
40         }
41     } else {
42         alpha = 0.6f;
43         view.setText(res.getString(R.string.ended));
44         view.setTextColor(res.getColor(R.color.batman_grey));
45         view.setClickable(false);
46     }
47
48     view.setAlpha(alpha);
49 }
50 }
```

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     alpha = 1f;
27     view.setTag(perk);
28     if (campaign.getStatus().equals("published")) {
29         if (!perk.isSoldOut()) {
30             view.setOnClickListener(
31                 Listeners.getPerkListener(campaign, context, googleAnalyticsAction));
32             view.setText(res.getString(R.string.get_perk));
33             view.setTextColor(res.getColor(R.color.gogenta));
34             view.setClickable(true);
35         } else {
36             alpha = 0.6f;
37             view.setText(res.getString(R.string.sold_out));
38             view.setTextColor(res.getColor(R.color.audi_grey));
39             view.setClickable(false);
40         }
41     } else {
42         alpha = 0.6f;
43         view.setText(res.getString(R.string.ended));
44         view.setTextColor(res.getColor(R.color.batman_grey));
45         view.setClickable(false);
46     }
47
48     view.setAlpha(alpha);
49 }
50 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             alpha = 1f;
30             view.setOnClickListener(
31                 Listeners.getPerkListener(campaign, context, googleAnalyticsAction));
32             view.setText(res.getString(R.string.get_perk));
33             view.setTextColor(res.getColor(R.color.gogenta));
34             view.setClickable(true);
35         } else {
36             alpha = 0.6f;
37             view.setText(res.getString(R.string.sold_out));
38             view.setTextColor(res.getColor(R.color.audi_grey));
39             view.setClickable(false);
40         }
41     } else {
42         alpha = 0.6f;
43         view.setText(res.getString(R.string.ended));
44         view.setTextColor(res.getColor(R.color.batman_grey));
45         view.setClickable(false);
46     }
47
48     view.setAlpha(alpha);
49 }
50 }
```



```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             alpha = 1f;
30             view.setOnClickListener(
31                 Listeners.getPerkListener(campaign, context, googleAnalyticsAction));
32             view.setText(res.getString(R.string.get_perk));
33             view.setTextColor(res.getColor(R.color.gogenta));
34             view.setClickable(true);
35         } else {
36             alpha = 0.6f;
37             view.setText(res.getString(R.string.sold_out));
38             view.setTextColor(res.getColor(R.color.audi_grey));
39             view.setClickable(false);
40         }
41     } else {
42         alpha = 0.6f;
43         view.setText(res.getString(R.string.ended));
44         view.setTextColor(res.getColor(R.color.batman_grey));
45         view.setClickable(false);
46     }
47     view.setAlpha(alpha);
48 }
49 }
50 }
```



```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
29     alpha = 1f;
30     view.setOnClickListener(
31         Listeners.getPerkListener(campaign, context, googleAnalyticsAction));
32     view.setText(res.getString(R.string.get_perk));
33     view.setTextColor(res.getColor(R.color.gogenta));
34     view.setClickable(true);
...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener listener;
6     private float alpha;
7
8     PerkButtonModel() {
9     }
10
11     public String getText() {
12         return text;
13     }
14
15     public int getColor() {
16         return color;
17     }
18
19     public boolean isClickable() {
20         return isClickable;
21     }
22
23     public View.OnClickListener getListener() {
24         return listener;
25     }
26
27     public float getAlpha() {
28         return alpha;
29     }
30 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7
8     PerkButtonModel(Resources res, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.text = res.getString(R.string.get_perk);
11         this.color = res.getColor(R.color.gogenta);
12         this.isClickable = true;
13         this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
14         this.alpha = 1f;
15     }
16
17     public String getText() {
18         return text;
19     }
20
21     public int getColor() {
22         return color;
23     }
24
25     public boolean isClickable() {
26         return isClickable;
27     }
28
29     public View.OnClickListener getClickListener() {
30         return clickListener;
31     }
32
33     ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             PerkButtonModel model = new PerkButtonModel(res, campaign, context, googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
33             view.setTextColor(model.getColor());
34             view.setClickable(model.isClickable());
35         } else {
36             alpha = 0.6f;
37             view.setText(res.getString(R.string.sold_out));
38             view.setTextColor(res.getColor(R.color.audi_grey));
39             view.setClickable(false);
40         }
41     } else {
42         alpha = 0.6f;
43         view.setText(res.getString(R.string.ended));
44         view.setTextColor(res.getColor(R.color.batman_grey));
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46     }
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48     view.setAlpha(alpha);
49 }
50 }
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```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     view.setTag(perk);
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28         if (!perk.isSoldOut()) {
29             PerkButtonModel model = new PerkButtonModel(res, campaign, context, googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
33             view.setTextColor(model.getColor());
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@sienatime #droidconbos

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## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
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4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7
8     PerkButtonModel(Resources res, Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.text = res.getString(R.string.get_perk);
11         this.color = res.getColor(R.color.gogenta);
12         this.isClickable = true;
13         this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
14         this.alpha = 1f;
15     }
16
17     ...
18 }
```





```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
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@sienatime #droidconbos

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5     private View.OnClickListener clickListener;
6     private float alpha;
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10         if (!perk.isSoldOut()) {
11             this.text = res.getString(R.string.get_perk);
12             this.color = res.getColor(R.color.gogenta);
13             this.isClickable = true;
14             this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
15             this.alpha = 1f;
16         } else {
17             this.alpha = 0.6f;
18             this.text = res.getString(R.string.sold_out);
19             this.color = res.getColor(R.color.audi_grey);
20             this.isClickable = false;
21         }
22     }
23     ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
2     ...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
33             view.setTextColor(model.getColor());
34             view.setClickable(model.isClickable());
35         } else {
36             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
37             alpha = model.getAlpha();
38             view.setText(model.getText());
39             view.setTextColor(model.getColor());
40             view.setClickable(model.isClickable());
41         }
42     } else {
43         alpha = 0.6f;
44         view.setText(res.getString(R.string.ended));
45         view.setTextColor(res.getColor(R.color.batman_grey));
46         view.setClickable(false);
47     }
48
49     view.setAlpha(alpha);
50 }
51 }
```



```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
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29             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
33             view.setTextColor(model.getColor());
34             view.setClickable(model.isClickable());
35         } else {
36             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
37             alpha = model.getAlpha();
38             view.setText(model.getText());
39             view.setTextColor(model.getColor());
40             view.setClickable(model.isClickable());
41         }
42     } else {
43         alpha = 0.6f;
44         view.setText(res.getString(R.string.ended));
45         view.setTextColor(res.getColor(R.color.batman_grey));
46         view.setClickable(false);
47     }
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49     view.setAlpha(alpha);
50 }
51 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7
8     PerkButtonModel(Resources res, Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         if (campaign.getStatus().equals("published")) {
11             if (!perk.isSoldOut()) {
12                 this.text = res.getString(R.string.get_perk);
13                 this.color = res.getColor(R.color.gogenta);
14                 this.isClickable = true;
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                 this.alpha = 1f;
17             } else {
18                 this.alpha = 0.6f;
19                 this.text = res.getString(R.string.sold_out);
20                 this.color = res.getColor(R.color.audi_grey);
21                 this.isClickable = false;
22             }
23         } else {
24             this.alpha = 0.6f;
25             this.text = res.getString(R.string.ended);
26             this.color = res.getColor(R.color.batman_grey);
27             this.isClickable = false;
28         }
29     }
30     ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
2     ...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
33             view.setTextColor(model.getColor());
34             view.setClickable(model.isClickable());
35         } else {
36             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
37             alpha = model.getAlpha();
38             view.setText(model.getText());
39             view.setTextColor(model.getColor());
40             view.setClickable(model.isClickable());
41         }
42     } else {
43         PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context, googleAnalyticsAction);
44         alpha = model.getAlpha();
45         view.setText(model.getText());
46         view.setTextColor(model.getColor());
47         view.setClickable(model.isClickable());
48     }
49
50     view.setAlpha(alpha);
51 }
52 }
```





```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
2     ...
25 void populateView() {
26     view.setTag(perk);
27     if (campaign.getStatus().equals("published")) {
28         if (!perk.isSoldOut()) {
29             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
30             alpha = model.getAlpha();
31             view.setOnClickListener(model.getClickListener());
32             view.setText(model.getText());
33             view.setTextColor(model.getColor());
34             view.setClickable(model.isClickable());
35         } else {
36             PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context,
googleAnalyticsAction);
37             alpha = model.getAlpha();
38             view.setText(model.getText());
39             view.setTextColor(model.getColor());
40             view.setClickable(model.isClickable());
41         }
42     } else {
43         PerkButtonModel model = new PerkButtonModel(res, perk, campaign, context, googleAnalyticsAction);
44         alpha = model.getAlpha();
45         view.setText(model.getText());
46         view.setTextColor(model.getColor());
47         view.setClickable(model.isClickable());
48     }
49     view.setAlpha(alpha);
50 }
51 }
52 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonViewModel.java
1 class PerkButtonViewModel {
2     ...
25 void populateView() {
26     view.setTag(perk);
27     PerkButtonModel model =
28         new PerkButtonModel(res, perk, campaign, context, googleAnalyticsAction);
29     alpha = model.getAlpha();
30     view.setText(model.getText());
31     view.setTextColor(model.getColor());
32     view.setClickable(model.isClickable());
33     if (model.isClickable()) {
34         view.setOnClickListener(model.getClickListener());
35     }
36
37     view.setAlpha(alpha);
38 }
39 }
```



# Let's recap

```
1 public final class PerkViewModel {
2     public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
3         Campaign campaign, Context context, String googleAnalyticsAction) {
4         PerkButtonViewModel perkButtonViewModel =
5             new PerkButtonViewModel(viewHolder.getPerkButton(), campaign, perk,
6                 (FragmentTransactingActivity) context, googleAnalyticsAction, res);
7         perkButtonViewModel.populateView();
8
9         float alpha = perkButtonViewModel.getAlpha();
10
11         viewHolder.getPerkAmount().setAlpha(alpha);
12         viewHolder.getPerkTitle().setAlpha(alpha);
13         viewHolder.getPerkDescription().setAlpha(alpha);
14         viewHolder.getPerksClaimed().setAlpha(alpha);
15         viewHolder.getEstimatedDelivery().setAlpha(alpha);
16         ...
17     }
18 }
```

```
1 class PerkButtonViewModel {  
  ...  
25 void populateView() {  
26     view.setTag(perk);  
27     PerkButtonModel model =  
28         new PerkButtonModel(res, perk, campaign, context, googleAnalyticsAction);  
29     alpha = model.getAlpha();  
30     view.setText(model.getText());  
31     view.setTextColor(model.getColor());  
32     view.setClickable(model.isClickable());  
33     if (model.isClickable()) {  
34         view.setOnClickListener(model.getClickListener());  
35     }  
36  
37     view.setAlpha(alpha);  
38 }  
39 }
```

```
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7
8     PerkButtonModel(Resources res, Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         if (campaign.getStatus().equals("published")) {
11             if (!perk.isSoldOut()) {
12                 this.text = res.getString(R.string.get_perk);
13                 this.color = res.getColor(R.color.gogenta);
14                 this.isClickable = true;
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                 this.alpha = 1f;
17             } else {
18                 this.alpha = 0.6f;
19                 this.text = res.getString(R.string.sold_out);
20                 this.color = res.getColor(R.color.audi_grey);
21                 this.isClickable = false;
22             }
23         } else {
24             this.alpha = 0.6f;
25             this.text = res.getString(R.string.ended);
26             this.color = res.getColor(R.color.batman_grey);
27             this.isClickable = false;
28         }
29     }
30     ...
}
```



# Let's keep going

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7
8     PerkButtonModel(Resources res, Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         if (campaign.getStatus().equals("published")) {
11             if (!perk.isSoldOut()) {
12                 this.text = res.getString(R.string.get_perk);
13                 this.color = res.getColor(R.color.gogenta);
14                 this.isClickable = true;
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                 this.alpha = 1f;
17             } else {
18                 this.alpha = 0.6f;
19                 this.text = res.getString(R.string.sold_out);
20                 this.color = res.getColor(R.color.audi_grey);
21                 this.isClickable = false;
22             }
23         } else {
24             this.alpha = 0.6f;
25             this.text = res.getString(R.string.ended);
26             this.color = res.getColor(R.color.batman_grey);
27             this.isClickable = false;
28         }
29     }
30     ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
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7
8     PerkButtonModel(Resources resources, Perk perk, Campaign campaign, FragmentTransactingActivity
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9         String googleAnalyticsAction) {
10         if (campaign.getStatus().equals("published")) {
11             if (!perk.isSoldOut()) {
12                 this.text = resources.getString(R.string.get_perk);
13                 this.color = resources.getColor(R.color.gogenta);
14                 this.isClickable = true;
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                 this.alpha = 1f;
17             } else {
18                 this.alpha = 0.6f;
19                 this.text = resources.getString(R.string.sold_out);
20                 this.color = resources.getColor(R.color.audi_grey);
21                 this.isClickable = false;
22             }
23         } else {
24             this.alpha = 0.6f;
25             this.text = resources.getString(R.string.ended);
26             this.color = resources.getColor(R.color.batman_grey);
27             this.isClickable = false;
28         }
29     }
30
31     ...
}
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7
8     PerkButtonModel(Resources resources, Perk perk, Campaign campaign, FragmentTransactingActivity
context,
9         String googleAnalyticsAction) {
10         if (campaign.getStatus().equals("published")) {
11             if (!perk.isSoldOut()) {
12                 this.text = resources.getString(R.string.get_perk);
13                 this.color = resources.getColor(R.color.gogenta);
14                 this.isClickable = true;
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                 this.alpha = 1f;
17             } else {
18                 this.alpha = 0.6f;
19                 this.text = resources.getString(R.string.sold_out);
20                 this.color = resources.getColor(R.color.audi_grey);
21                 this.isClickable = false;
22             }
23         } else {
24             this.alpha = 0.6f;
25             this.text = resources.getString(R.string.ended);
26             this.color = resources.getColor(R.color.batman_grey);
27             this.isClickable = false;
28         }
29     }
30
31     ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     private int color;
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
6     private float alpha;
7     private Resources resources;
8
9     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
10         String googleAnalyticsAction) {
11         this.resources = context.getResources();
12         if (campaign.getStatus().equals("published")) {
13             if (!perk.isSoldOut()) {
14                 this.text = resources.getString(R.string.get_perk);
15                 this.color = resources.getColor(R.color.gogenta);
16                 this.isClickable = true;
17                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
18                 this.alpha = 1f;
19             } else {
20                 this.alpha = 0.6f;
21                 this.text = resources.getString(R.string.sold_out);
22                 this.color = resources.getColor(R.color.audi_grey);
23                 this.isClickable = false;
24             }
25         } else {
26             this.alpha = 0.6f;
27             this.text = resources.getString(R.string.ended);
28             this.color = resources.getColor(R.color.batman_grey);
29             this.isClickable = false;
30         }
31     }
}
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private String text;
3     ...
4
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                this.text = resources.getString(R.string.get_perk);
13                this.color = resources.getColor(R.color.gogenta);
14                this.isClickable = true;
15                this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                this.alpha = 1f;
17            } else {
18                this.alpha = 0.6f;
19                this.text = resources.getString(R.string.sold_out);
20                this.color = resources.getColor(R.color.audi_grey);
21                this.isClickable = false;
22            }
23        } else {
24            this.alpha = 0.6f;
25            this.text = resources.getString(R.string.ended);
26            this.color = resources.getColor(R.color.batman_grey);
27            this.isClickable = false;
28        }
29    }
30
31    public String getText() {
32        return text;
33    }
34    ...
35}
```



## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     ...
4
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                this.text = R.string.get_perk;
13                this.color = resources.getColor(R.color.gogenta);
14                this.isClickable = true;
15                this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                this.alpha = 1f;
17            } else {
18                this.alpha = 0.6f;
19                this.text = R.string.sold_out;
20                this.color = resources.getColor(R.color.audi_grey);
21                this.isClickable = false;
22            }
23        } else {
24            this.alpha = 0.6f;
25            this.text = R.string.ended;
26            this.color = resources.getColor(R.color.batman_grey);
27            this.isClickable = false;
28        }
29    }
30
31    public String getText() {
32        return resources.getString(text);
33    }
34
35 }
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     ...
5
6     private Resources resources;
7
8     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.resources = context.getResources();
11         if (campaign.getStatus().equals("published")) {
12             if (!perk.isSoldOut()) {
13                 this.text = R.string.get_perk;
14                 this.color = resources.getColor(R.color.gogenta);
15                 this.isClickable = true;
16                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
17                 this.alpha = 1f;
18             } else {
19                 this.alpha = 0.6f;
20                 this.text = R.string.sold_out;
21                 this.color = resources.getColor(R.color.audi_grey);
22                 this.isClickable = false;
23             }
24         } else {
25             this.alpha = 0.6f;
26             this.text = R.string.ended;
27             this.color = resources.getColor(R.color.batman_grey);
28             this.isClickable = false;
29         }
30     }
31 }
32 ...
33 public int getColor() {
34     return color;
35 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     ...
5
6     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
7         String googleAnalyticsAction) {
8         this.resources = context.getResources();
9         if (campaign.getStatus().equals("published")) {
10             if (!perk.isSoldOut()) {
11                 this.text = R.string.get_perk;
12                 this.color = R.color.gogenta;
13                 this.isClickable = true;
14                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
15                 this.alpha = 1f;
16             } else {
17                 this.alpha = 0.6f;
18                 this.text = R.string.sold_out;
19                 this.color = R.color.audi_grey;
20                 this.isClickable = false;
21             }
22         } else {
23             this.alpha = 0.6f;
24             this.text = R.string.ended;
25             this.color = R.color.batman_grey;
26             this.isClickable = false;
27         }
28     }
29
30     ...
31
32     public int getColor() {
33         return resources.getColor(color);
34     }
35 }
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
4     private boolean isClickable;
5     private View.OnClickListener clickListener;
8
9     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
10         String googleAnalyticsAction) {
11         this.resources = context.getResources();
12         if (campaign.getStatus().equals("published")) {
13             if (!perk.isSoldOut()) {
14                 ...
16                 this.isClickable = true;
17                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
18             }
19             } else {
20                 ...
23                 this.isClickable = false;
24             }
25         } else {
26             ...
29             this.isClickable = false;
30         }
31     }
32
33     ...
41     public boolean isClickable() {
42         return isClickable;
43     }
44
45     public View.OnClickListener getClickListener() {
46         return clickListener;
47     }
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
...
4     private View.OnClickListener clickListener;
...
8     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.resources = context.getResources();
11         if (campaign.getStatus().equals("published")) {
12             if (!perk.isSoldOut()) {
...
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
...
17             } else {
...
21             }
22         } else {
...
26         }
27     }
28
...
37     public boolean isClickable() {
38         return getClickListener() != null;
39     }
40
41     public View.OnClickListener getClickListener() {
42         return clickListener;
43     }
}
```





```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private float alpha;
6     private Resources resources;
7
8     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.resources = context.getResources();
11         if (campaign.getStatus().equals("published")) {
12             if (!perk.isSoldOut()) {
13                 this.text = R.string.get_perk;
14                 this.color = R.color.gogenta;
15                 this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
16                 this.alpha = 1f;
17             } else {
18                 this.alpha = 0.6f;
19                 this.text = R.string.sold_out;
20                 this.color = R.color.audi_grey;
21             }
22         } else {
23             this.alpha = 0.6f;
24             this.text = R.string.ended;
25             this.color = R.color.batman_grey;
26         }
27     }
28
29     ...
30
31     public float getAlpha() {
32         return alpha;
33     }
34 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                this.text = R.string.get_perk;
13                this.color = R.color.gogenta;
14                this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
15            } else {
16                this.text = R.string.sold_out;
17                this.color = R.color.audi_grey;
18            }
19        } else {
20            this.text = R.string.ended;
21            this.color = R.color.batman_grey;
22        }
23    }
24
25    ...
41    public float getAlpha() {
42        return isClickable() ? 1f : 0.6f;
43    }
44 }
```



# Guess what

It's (poly)morphin'  
time

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                this.text = R.string.get_perk;
13                this.color = R.color.gogenta;
14                this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
15            } else {
16                this.text = R.string.sold_out;
17                this.color = R.color.audi_grey;
18            }
19        } else {
20            this.text = R.string.ended;
21            this.color = R.color.batman_grey;
22        }
23    }
24    ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     ...
45     private abstract class ModelData {
46         int text;
47         int color;
48         View.OnClickListener clickListener;
49     }
50 }
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     ...
45     private abstract class ModelData {
46         int text;
47         int color;
48         View.OnClickListener clickListener;
49     }
50 }
51 private class ActivePerkData extends ModelData {
52     ActivePerkData(Campaign campaign, FragmentTransactingActivity context,
53         String googleAnalyticsAction) {
54         this.text = R.string.get_perk;
55         this.color = R.color.gogenta;
56         this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
57     }
58 }
59 }
```





```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                this.text = R.string.get_perk;
13                this.color = R.color.gogenta;
14                this.clickListener = Listeners.getPerkListener(campaign, context, googleAnalyticsAction);
15            } else {
16                this.text = R.string.sold_out;
17                this.color = R.color.audi_grey;
18            }
19        } else {
20            this.text = R.string.ended;
21            this.color = R.color.batman_grey;
22        }
23    }
24    ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                ModelData model = new ActivePerkData(campaign, context, googleAnalyticsAction);
13                this.text = model.text;
14                this.color = model.color;
15                this.clickListener = model.clickListener;
16            } else {
17                this.text = R.string.sold_out;
18                this.color = R.color.audi_grey;
19            }
20        } else {
21            this.text = R.string.ended;
22            this.color = R.color.batman_grey;
23        }
24    }
25    ...
}
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                ModelData model = new ActivePerkData(campaign, context, googleAnalyticsAction);
13                this.text = model.text;
14                this.color = model.color;
15                this.clickListener = model.clickListener;
16            } else {
17                this.text = R.string.sold_out;
18                this.color = R.color.audi_grey;
19            }
20        } else {
21            this.text = R.string.ended;
22            this.color = R.color.batman_grey;
23        }
24    }
25    ...
}
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                ModelData model = new ActivePerkData(campaign, context, googleAnalyticsAction);
13                this.text = model.text;
14                this.color = model.color;
15                this.clickListener = model.clickListener;
16            } else {
17                ModelData model = new SoldOutPerkData();
18                this.text = model.text;
19                this.color = model.color;
20            }
21        } else {
22            ModelData model = new EndedCampaignPerkData();
23            this.text = model.text;
24            this.color = model.color;
25        }
26    }
}
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6
7     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
8         String googleAnalyticsAction) {
9         this.resources = context.getResources();
10        if (campaign.getStatus().equals("published")) {
11            if (!perk.isSoldOut()) {
12                ModelData model = new ActivePerkData(campaign, context, googleAnalyticsAction);
13                this.text = model.text;
14                this.color = model.color;
15                this.clickListener = model.clickListener;
16            } else {
17                ModelData model = new SoldOutPerkData();
18                this.text = model.text;
19                this.color = model.color;
20            }
21        } else {
22            ModelData model = new EndedCampaignPerkData();
23            this.text = model.text;
24            this.color = model.color;
25        }
26    }
}
```



## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6     private ModelData model;
7
8     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.resources = context.getResources();
11         if (campaign.getStatus().equals("published")) {
12             if (!perk.isSoldOut()) {
13                 this.model = new ActivePerkData(campaign, context, googleAnalyticsAction);
14             } else {
15                 this.model = new SoldOutPerkData();
16             }
17         } else {
18             this.model = new EndedCampaignPerkData();
19         }
20         this.color = model.color;
21         this.text = model.text;
22         this.clickListener = model.clickListener;
23     }
24
25     public String getText() {
26         return resources.getString(text);
27     }
28
29     public int getColor() {
30         return resources.getColor(color);
31     }
}
```



```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private int text;
3     private int color;
4     private View.OnClickListener clickListener;
5     private Resources resources;
6     private ModelData model;
7
8     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
9         String googleAnalyticsAction) {
10         this.resources = context.getResources();
11         if (campaign.getStatus().equals("published")) {
12             if (!perk.isSoldOut()) {
13                 this.model = new ActivePerkData(campaign, context, googleAnalyticsAction);
14             } else {
15                 this.model = new SoldOutPerkData();
16             }
17         } else {
18             this.model = new EndedCampaignPerkData();
19         }
20         this.color = model.color;
21         this.text = model.text;
22         this.clickListener = model.clickListener;
23     }
24
25     public String getText() {
26         return resources.getString(text);
27     }
28
29     public int getColor() {
30         return resources.getColor(color);
31     }
32 ...
```

## 2. Change

@sienatime #droidconbos

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private Resources resources;
3     private ModelData model;
4
5     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
6         String googleAnalyticsAction) {
7         this.resources = context.getResources();
8         if (campaign.getStatus().equals("published")) {
9             if (!perk.isSoldOut()) {
10                 this.model = new ActivePerkData(campaign, context, googleAnalyticsAction);
11             } else {
12                 this.model = new SoldOutPerkData();
13             }
14         } else {
15             this.model = new EndedCampaignPerkData();
16         }
17     }
18
19     public String getText() {
20         return resources.getString(model.text);
21     }
22
23     public int getColor() {
24         return resources.getColor(model.color);
25     }
26
27     public boolean isClickable() {
28         return getClickListener() != null;
29     }
30
31     public View.OnClickListener getClickListener() {
32         return model.clickListener;
33     }
34 }
```



Not to brag, but...

At no point did  
my app crash.

```
// ApplicationHelper.java
237 public static void setPerkView(Resources res, PerkRow.ViewHolder viewHolder, Perk perk,
238     Campaign campaign, Context context, String googleAnalyticsAction) {
239     boolean isSoldOut =
240         perk.getNumberAvailable() != null && perk.getNumberClaimed() >= perk.getNumberAvailable();
241     float alpha = 1f;
242     TextView perkButton = viewHolder.getPerkButton();
243     perkButton.setTag(perk);
244     if (campaign.getStatus().equals("published")) {
245         if (!isSoldOut) {
246             perkButton.setOnClickListener(
247                 Listeners.getPerkListener(campaign, (FragmentTransactingActivity) context,
248                     googleAnalyticsAction));
249             perkButton.setText(res.getString(R.string.get_perk));
250             perkButton.setTextColor(res.getColor(R.color.gogenta));
251             perkButton.setClickable(true);
252         } else {
253             alpha = 0.6f;
254             perkButton.setText(res.getString(R.string.sold_out));
255             perkButton.setTextColor(res.getColor(R.color.audi_grey));
256             perkButton.setClickable(false);
257         }
258     } else {
259         alpha = 0.6f;
260         perkButton.setText(res.getString(R.string.ended));
261         perkButton.setTextColor(res.getColor(R.color.batman_grey));
262         perkButton.setClickable(false);
263     }
264
265     perkButton.setAlpha(alpha);
266     viewHolder.getPerkAmount().setAlpha(alpha);
267     viewHolder.getPerkTitle().setAlpha(alpha);
... // another 40 lines of code
```

```
// PerkButtonModel.java
1 class PerkButtonModel {
2     private Resources resources;
3     private ModelData model;
4
5     PerkButtonModel(Perk perk, Campaign campaign, FragmentTransactingActivity context,
6         String googleAnalyticsAction) {
7         this.resources = context.getResources();
8         if (campaign.getStatus().equals("published")) {
9             if (!perk.isSoldOut()) {
10                 this.model = new ActivePerkData(campaign, context, googleAnalyticsAction);
11             } else {
12                 this.model = new SoldOutPerkData();
13             }
14         } else {
15             this.model = new EndedCampaignPerkData();
16         }
17     }
18
19     public String getText() {
20         return resources.getString(model.text);
21     }
22
23     public int getColor() {
24         return resources.getColor(model.color);
25     }
26
27     public boolean isClickable() {
28         return getClickListener() != null;
29     }
30
31     public View.OnClickListener getClickListener() {
32         return model.clickListener;
33     }
34 }
```



# Other Use Cases

# Replace Component

Some core piece of the Android framework has been replaced with a newer component.

# Replace Component: Discover

How different are the components?

How can you refactor to make the transition easier?

# Replace Component: Change

If moving from one type to another, try copying the new methods to the old class and implementing them one by one.

As soon as it is possible to do so without losing functionality, change the old class to the new class.

Remember, if your app crashes, you have to back out the last change you did and try again.

It's okay to bend the rules sometimes.

# Upgrade Library

A third-party library you use has a new version with breaking changes.

# Upgrade Library: Discover

How major are the breaking changes?

Have you wrapped your library usage in your own class or is usage spread across your codebase?

# Upgrade Library: Change

Refactor to put your third-party library usage behind your own class if you can. Name it after the use case, not the library.

If you can load the two versions simultaneously (e.g. Retrofit 1 => 2), do that and continue applying changes one line at a time.

Otherwise, organize as much as you can before fully switching to minimize time in the “danger zone” (when you’re not “safe and bored”)

- Martin Fowler, *Refactoring: Improving the Design of Existing Code*. Published by Addison Wesley, 1999.
- Sandi Metz, “Practical Object-Oriented Design.” Workshop at the Indiegogo offices in San Francisco, CA, USA. May 9–11, 2016.
- Code Smell Taxonomy: Mäntylä, M. V. and Lassenius, C. "Subjective Evaluation of Software Evolvability Using Code Smells: An Empirical Study". Journal of Empirical Software Engineering, vol. 11, no. 3, 2006, pp. 395-431.  
<http://mikamantyla.eu/BadCodeSmellsTaxonomy.html>
- Interactive refactoring catalog: <https://www.refactoring.com/catalog/>



