Color Coordinator

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Software Requirements Specification Document

Version: 1.00 **Date:2/17/16**

Change History:

Version #	Date of Revision	Description of Changes
1.00	2/11/16	Initial draft of Requirements Document

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1. Introduction

1.1 Purpose

This document describes the software requirements for an android application named Color Coordinator. The goal of this specification is to help provide the designers, developers and maintainers with information about the project. In the hope of increasing accuracy and efficiency toward the goal of creating the application.

1.2 Scope

The function of Color Coordinator is to help by assisting the user with their selection of clothes. The application will require a picture to be taken of each piece of clothing and will then assess whether or not the set of clothing matches or not. It will either reject the clothing set and ask for another, or it will accept it and inform the user.

1.3 Overview

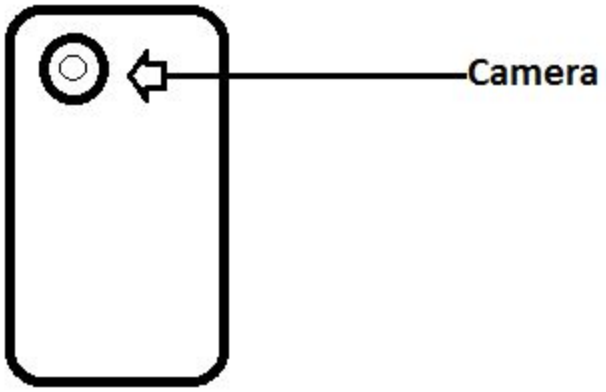
The remainder of this document continues to explore the information related to Color Coordinator. The next section deals with important definitions. Then Chapter 2 goes into the description of Color Coordinator. Finally Chapter 3 will provide the specific functional requirements, external requirements, and the performance requirements of Color Coordinator.

1.4 Definitions

- **Clothing**
    - This will be user specific items.
    - Any of the following type of clothing items:
        - Shirts, Pants, Belt, Hat, Shoes, Tie, Jacket
- **Outfit**
    - This is the set of clothing that has been selected by the user.
    - The outfit will be scanned to compare each set of clothing.

- **Stored Clothing**
    - Clothing already entered into the device will be saved.
    - User can select them and then compare or take pictures for other sets of clothing.

- **Camera**
    - Required for app use.
    - Picture is taken through camera off the clothing that is wanting to be checked.



- **Gui**
    - Graphics used for the users interactions.
    - It will allow the user to operate with the application.
    - This is done by adding clothing or selecting wardrobe.

- **Match Threshold**
    - How strict or not the user wants to be when choosing their outfit.

2. General Description

2.1 Product Perspective

The Color Coordinator application is a self-contained application for the Android platform intended for version 4.0 (Ice Cream Sandwich) or later. The scope of this product only includes client-side functionalities and is not tied to any other toolset. Additionally, all data will be stored locally.

2.2 Product Functions

The major functions of this application are as follows:

- Have a user-friendly GUI in addition to being accessible to users with TalkBack
- Allow the user to take pictures of articles of clothing
- Recognize whether an article has a pattern or does not (pattern type doesn't matter)
- Create a new outfit, starting with a single piece of clothing
- Add other articles to that outfit and assign a match rating from 0-100
- Allow the user to adjust the match threshold to be more or less strict
- Outfits must be able to be saved locally to allow the user to utilize them while shopping.

- Recommend colors that could be added to complete an outfit for users without visual impairments

2.3 User Characteristics

The Color Coordinator app is intended for use by 3 different classes of users: users with no visual impairments, users with some visual impairment, and users with complete blindness. The application should be usable by the first two classes of user without any training. For blind users, some instruction will be required to assist them in taking pictures of the clothing, given through either TalkBack or an audio recording.

2.4 Assumptions and Dependencies

One assumption about the product is that it will be used on a mobile device with enough storage space to store the pictures taken by the application. If the user does not have enough space to take any pictures, the product will not be able to function properly.

Another assumption is that the camera on the user's device adequately captures the correct colors. If there is a problem with the camera and it is not capturing the true color of an article of clothing, the product cannot be expected to give an appropriate match rating.

3. Requirements

3.1 Functional Requirements

1. The user should be notified by an audial cue and an accompanying visual cue when the system has finished computing a match score of the outfit.
2. The user should be reminded to take close-up shots before they take the first picture in an outfit.
3. The matching percentage of an outfit should always be displayed on the outfit selection screen.
4. The system should display a list of colors in the outfit along with the matching percentage once the user requests the matching information.
5. The system should recognize if multiple pieces of clothing contain patterns and recommend against wearing both
6. The system should display an alternate color suggestion for the user if an item of the outfit is not matchable with the other items and prompt the user to see if they want to remove that item.

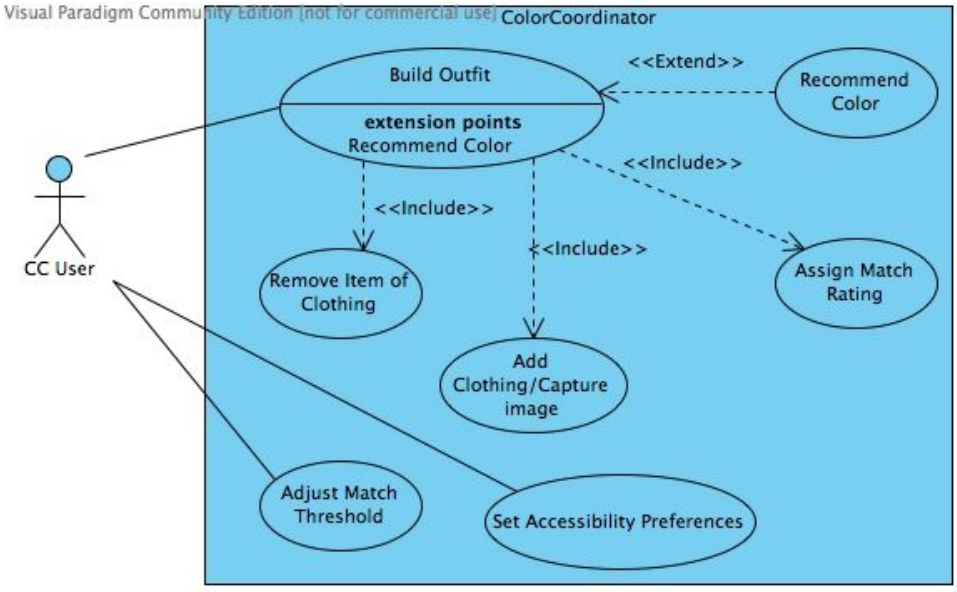
7. The user should have the ability to turn off accessibility prompts as a setting.
8. The user should be able to turn off color recommendations as a setting.
9. Users should be able to remove an item from an outfit.

3.2 Non-Functional Requirements

1. The system must have a working camera in order to be able to use this application.
2. The system must have at least Android API 14 (Ice Cream Sandwich) in order to use the application.
3. Prompts instructing or alerting the user and any non-textual controls should be able to be read by the system's TalkBack functionality.
4. The current outfit state should still be available if the app has become out of focus or view as long as it is still running in memory.
5. The colors used in the user interface should be readable even when high-contrast mode is enabled in the system settings.
6. The application should be able to compute a matching score for at least 10 items.
7. The system will assume that outfit pictures are taken in similar conditions for comparison.

4. Diagrams and Analysis

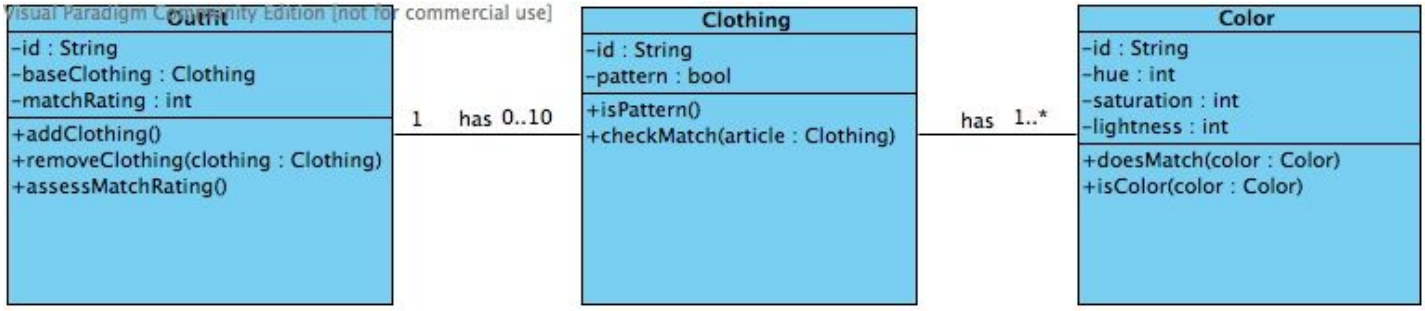
4.1 Use Case Diagram



- The majority of use cases are found under the Build Outfit use case, as this is the core functionality of the app, where the user composes an outfit and is presented a match rating

- The user will be able to interact with the app to both add and remove articles of clothing. When adding, they will be instructed to capture an image of the article of clothing.
- The system should be able to both assign a match rating and recommend a color based on the clothing that the user adds to the outfit
- Outside of the build outfit case, users should be able to both adjust their match threshold to be more or less strict and adjust their accessibility settings including toggling the color recommendation feature

4.2 Class Diagram

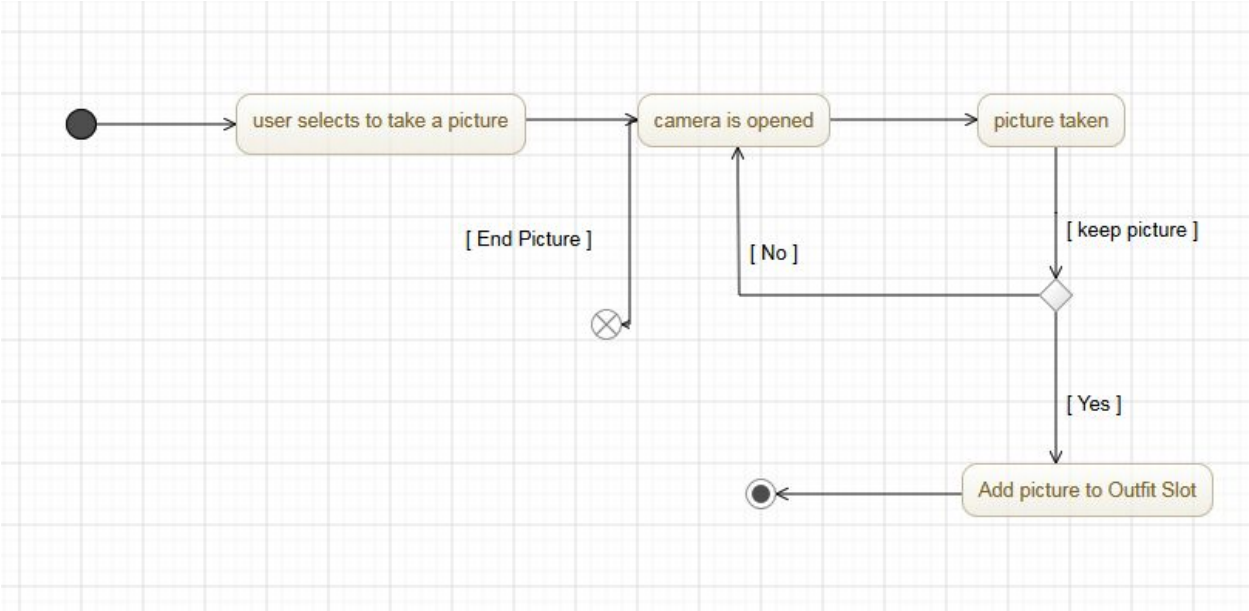


Above are three of the primary classes needed for this system, along with some basic methods and attributes required. Their descriptions are as follows:

- All objects are to have a unique id.
- Colors are to be defined in the HSL color space, represented by the three attributes of hue, saturation, and lightness. The method doesMatch() will determine if one color object matches another. In addition, the method isColor() will be used to discern if one color object is practically identical to another. A color will be declared equivalent to another if they lie within a relatively close proximity on a color wheel.
- Clothing objects will be defined primarily by the colors that compose them, shown by the “has” relationship above. A boolean value named pattern will be set to true when a clothing object is composed of multiple different colors, and isPattern() will return this value. Additionally, the checkMatch() method will compare the array of colors in one clothing object to another to return if they match or not.
- Outfit objects will be composed of Clothing objects, one of which being the baseClothing object that the outfit is built around. Clothing objects will be added or removed through their respective methods. A matchRating attribute will maintain the current match rating from 0-100 for the current outfit. This value will be reevaluated and updated with every call to assessMatchRating().

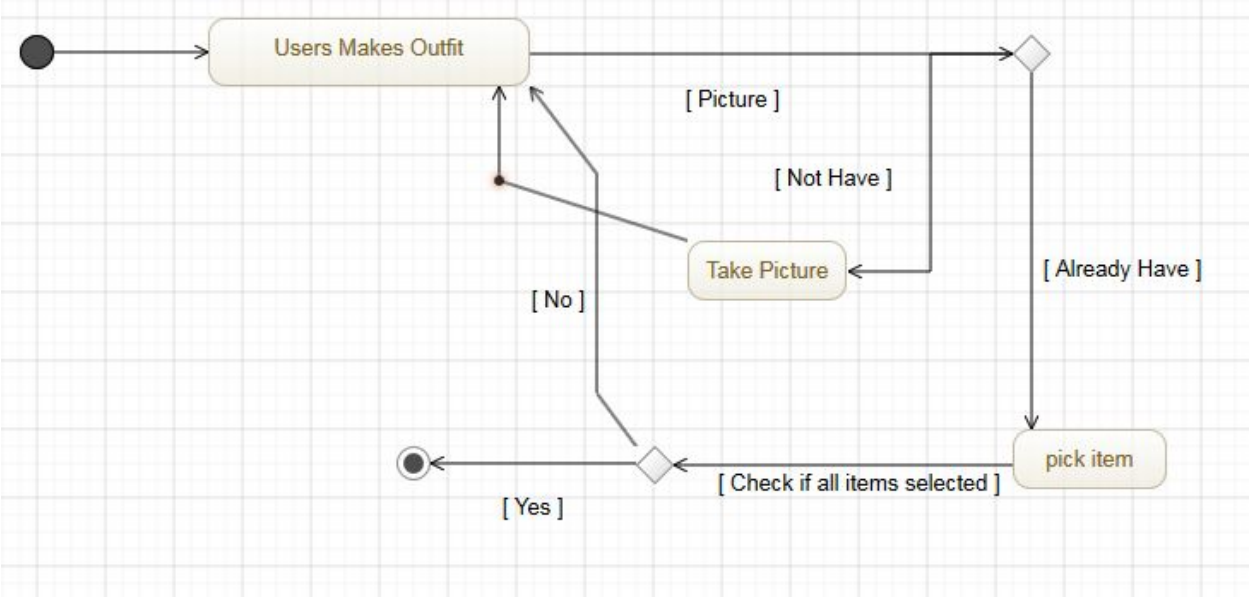
4.3 Activity Diagrams

1. Take Picture



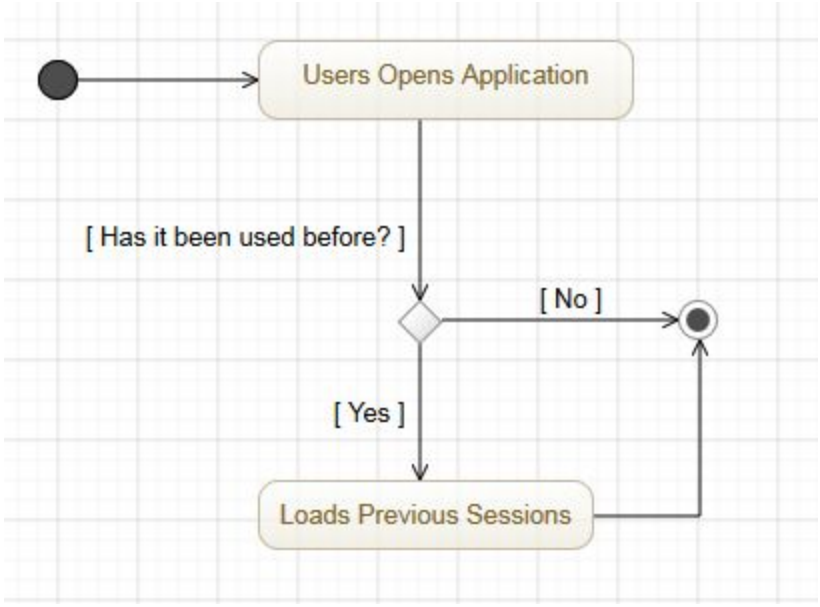
- The take picture activity follows the actions of the user taking a picture to add to the outfit.

2. Outfit Selection



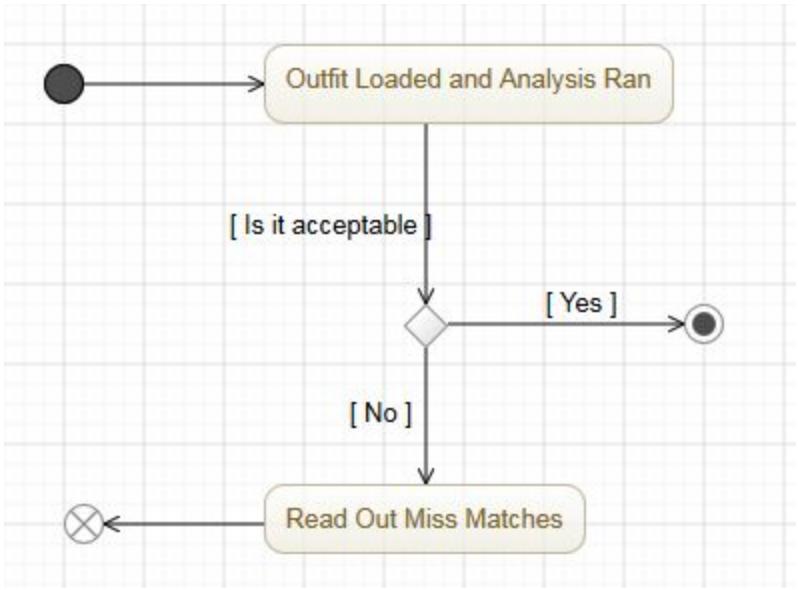
- The Outfit Selection activity deals with the process of the user interacting with the outfit setup process.

3. Open Application



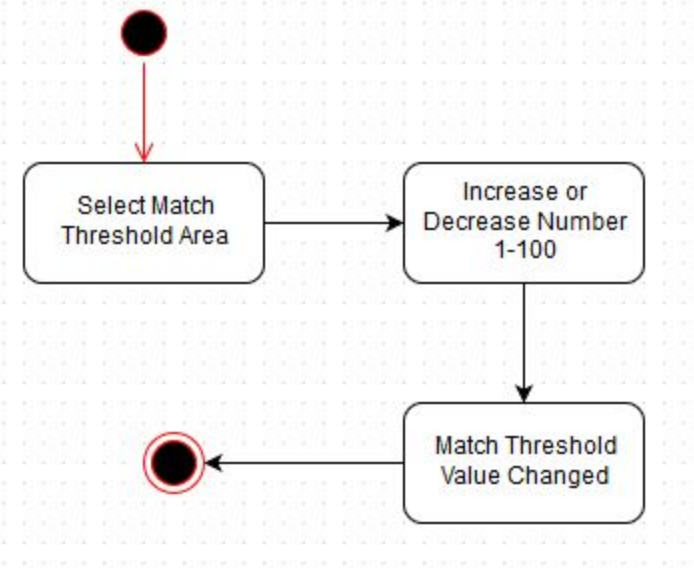
- Open Application is the handling of the initialization of Color Coordinator.

4. Compute Outfit Results



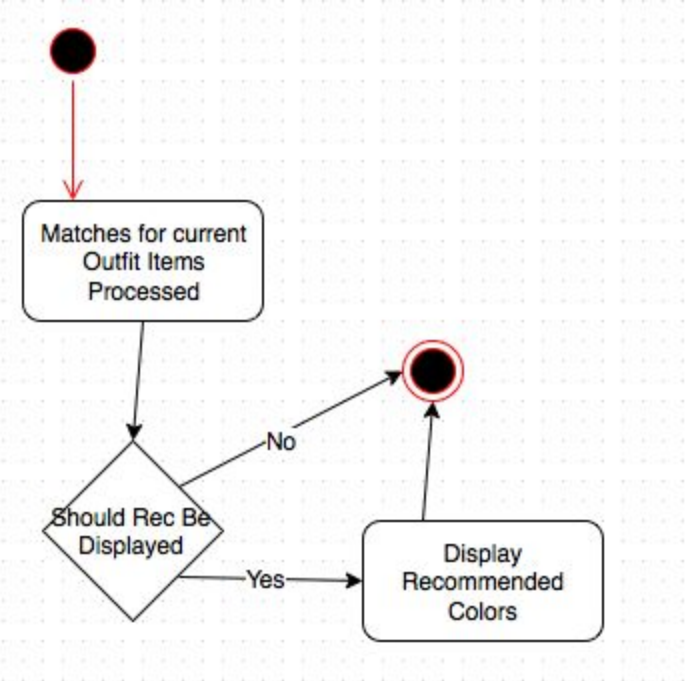
- This activity displays the testing of the Outfit to determine if it matches or not.

5. Adjust Match Threshold



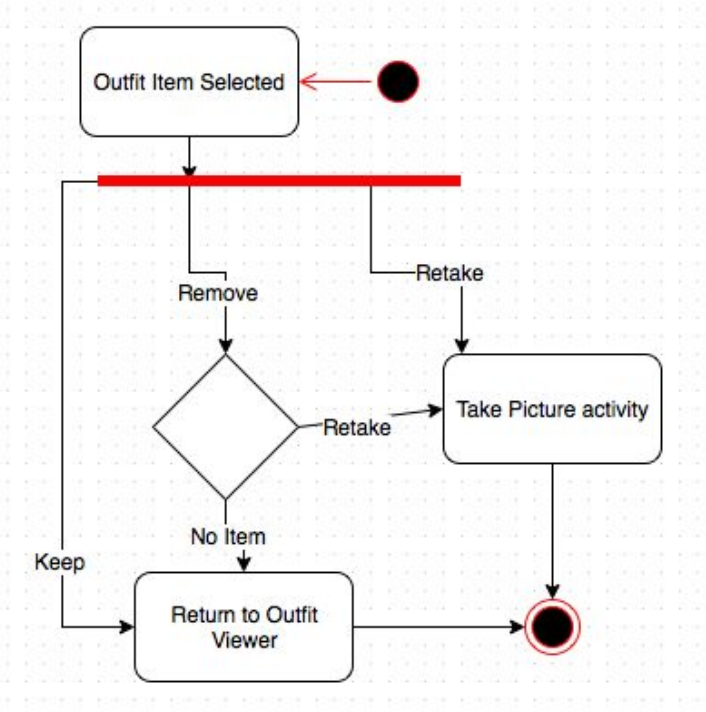
- The activity shows how the user can change the match percent of the overall outfit.

6. Recommend Color For Next Item



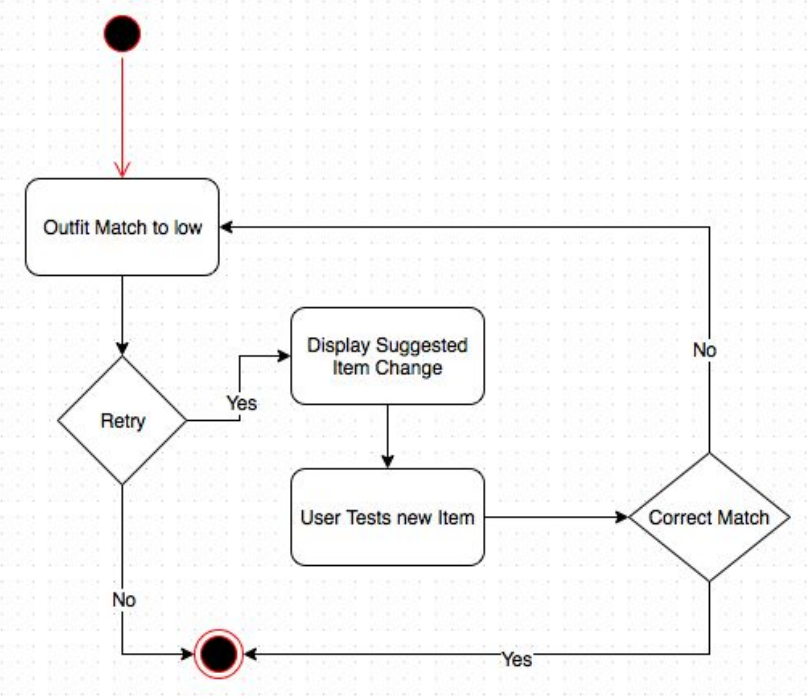
- Activity for recommending a color to the user as a suggestion for what would match well with other Outfit items.

7. Remove Outfit Item



- Activity to remove an item from the Outfit.

8. Alternate Item Suggestion



- If the color did not match enough the user is given the chance to change out the item in the Outfit.