Architecture

# Disclamer

This document is a structural analysis of Games Workshop’s rules for Warhammer 40k. It doesn’t replace the rulebook as it’s not precise enougth to play. The only aim of this book is to clarify the concepts used in the software tool and to define the mapping with Games workshop naming.

# Combat simulation

## Combat Rolls

W40k follow a « 3dice-roll » model to make combats. Every model or weapon has a number of attacks on its profile which determines the number of dices in the roll.

1. The first roll is the « **Hit roll** » which converts successfull attacks into « **hits** ». This phase only consider the attacking model skill to hit.
2. One dice is roll for each hits for the « **Wound roll** », which convert successfull hits into « **wounds** ». This phase makes a combinaison of attacker strength againts defenser toughness.
3. Wounds shall be allocate on models, starting with the one that already took damage previously in the game, if any.
4. Once allocated, the defenser rolls a dice for each wound for the « **Save roll**». Successfull results converts wounds into « **damage points**». This phase only consider the defenser model armor capacity.

As every dice phase has its own particularities, we decided to create a class to represent each of the rolls :

* HitRolls.java
* WoundRolls.java
* SaveRolls.java

## Dice result modification

In some case the dice result can be modified, in that order, by :

* A reroll capacity which allows to reroll misses. Note that a dice is never rerolled more than once. It can be :
  + Reroll ones
  + Reroll optionally failed dices
  + Reroll all failed dices
* A « **modificator**» which increase or decrease the dice result with :
  + Multiplication (x2)
  + Addition (-1, +1, …)