

Assignment 3

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Conceptual Model including profit

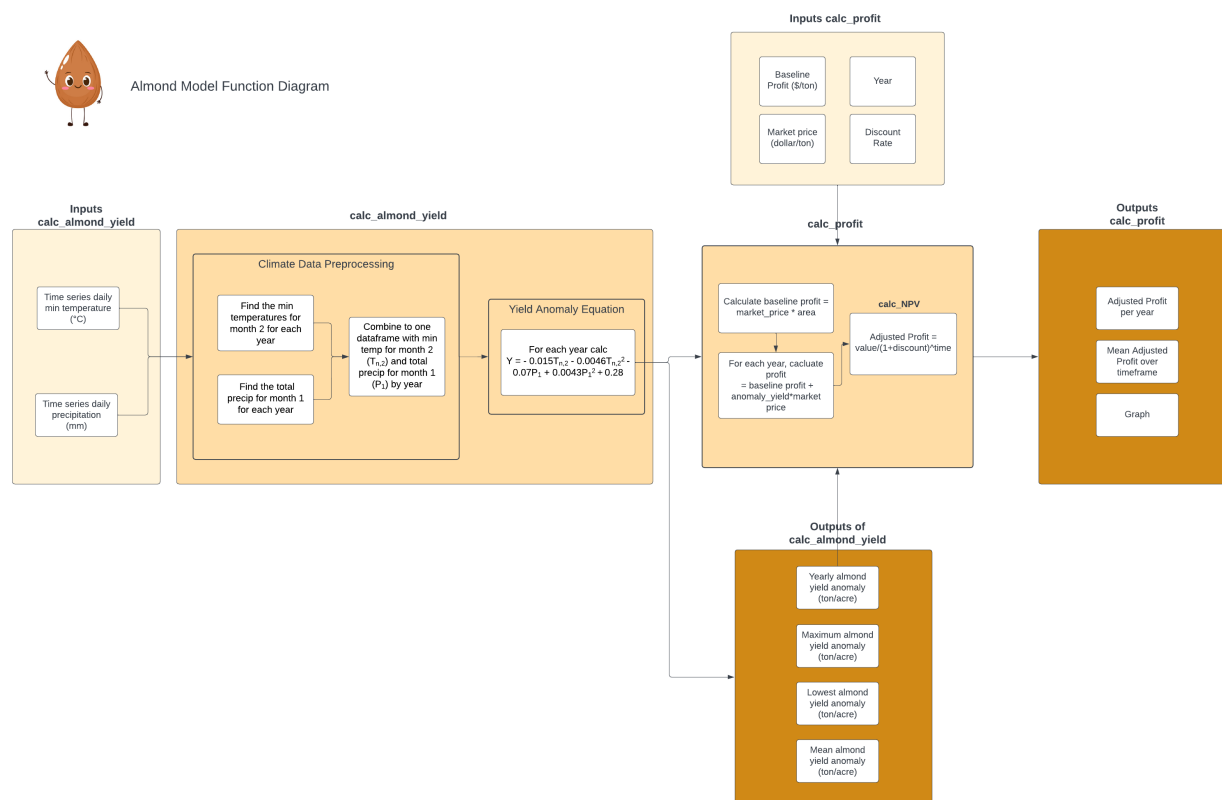


Figure 1: Almond Model Function Diagram

Application of Function

```
source("calc_almond_yield.R")
source("calc_profit.R")
source("calc_NPV.R")

yield <- calc_almond_yield("clim.txt")
```

```
## 'summarise()' has grouped output by 'year'. You can override using the
## '.groups' argument.
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## '.groups' argument.
## Joining, by = "year"
```

```
profit <- calc_profit(calc_almond_yield_results = yield)
```

#Exploration

```
# market_price = 5000
# discount=0.12
# area = 10
# baseline_profit = market_price * area
#
# yield_df$anomaly_profit = anomaly_value * market_price * area #returns dollars
# yield_df$total_profit = yield_df$anomaly_profit + baseline_profit
```

#Informal Sensitivity Analysis

```
# generate samples for both parameters
nsamples = 300
deviation = 0.15
base_price = 5000
market_price = runif(min=base_price-deviation*base_price,
                     max = base_price+deviation*base_price, n=nsamples)

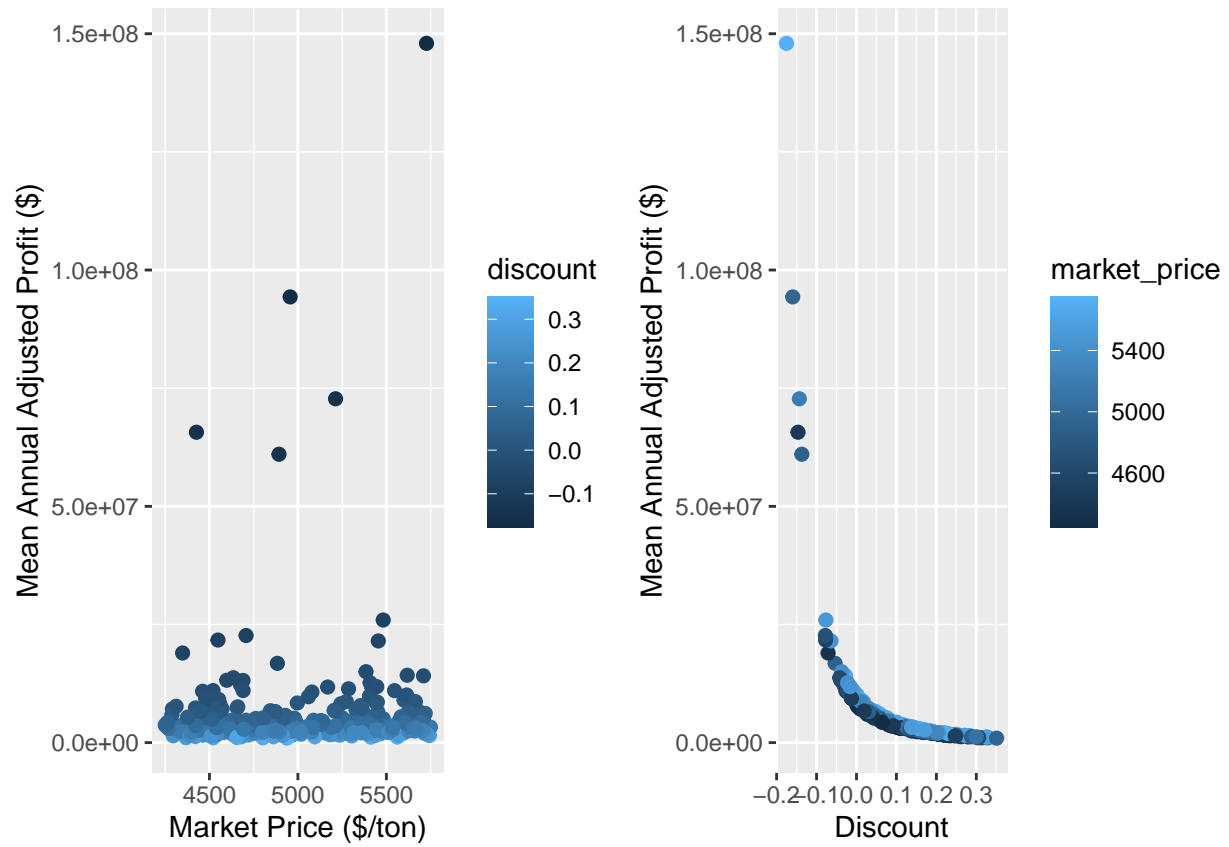
discount = rnorm(mean=0.12, sd = 0.1, n=nsamples)

parms = cbind.data.frame(discount, market_price)

# takes function name and then names of all parameters that don't change
results = parms %>% pmap(calc_profit, calc_almond_yield_results = yield)

# now we can extract results from the list as above
mean_adjusted_profit = map_df(results, `[, c("mean")])
# and we can add the parameter values for each run
mean_adjusted_profit = cbind.data.frame(mean_adjusted_profit, parms)

# plot - pick on of the 2 parameter as a color
p1 = ggplot(mean_adjusted_profit, aes(market_price, mean, col=discount))+geom_point(cex=2)+
  labs(y="Mean Annual Adjusted Profit ($)", x="Market Price ($/ton)")
p2 = ggplot(mean_adjusted_profit, aes(discount, mean, col=market_price))+geom_point(cex=2)+
  labs(y="Mean Annual Adjusted Profit ($)", x="Discount")
ggarrange(p1,p2)
```



When comparing the two parameters (market price and discount), discount rate has more of an effect on mean annual profit.