

REGRESSION

DEMAND PLANNERS

QUANT TRADERS

CREDIT RISK ANALYSTS

INSURANCE PROVIDERS

ALL THESE GUYS
WANT TO **PREDICT**
SOMETHING
BEFORE IT HAPPENS

REGRESSION

DEMAND PLANNERS

QUANT TRADERS

CREDIT RISK ANALYSTS

INSURANCE PROVIDERS

HOW MUCH
WILL WE **SELL**
TOMORROW?

REGRESSION

DEMAND PLANNERS HOW MUCH WILL WE **SELL** TOMORROW?

QUANT TRADERS

CREDIT RISK ANALYSTS

INSURANCE PROVIDERS

HOW MUCH
RETURN WILL I
GET ON A STOCK?

REGRESSION

DEMAND PLANNERS

HOW MUCH WILL WE **SELL** TOMORROW?

QUANT TRADERS

HOW MUCH **RETURN** WILL I GET ON A STOCK?

CREDIT RISK ANALYSTS

INSURANCE PROVIDERS

WHAT IS THE
RISK OF A
CUSTOMER
DEFAULTING?

REGRESSION

DEMAND PLANNERS HOW MUCH WILL WE **SELL** TOMORROW?

QUANT TRADERS HOW MUCH **RETURN** WILL I GET ON A STOCK?

CREDIT RISK ANALYSTS WHAT IS THE **RISK** OF A CUSTOMER DEFAULTING?

INSURANCE PROVIDERS
WHAT IS THE **RISK**
THAT THIS POLICY
WILL BE CLAIMED?

REGRESSION

DEMAND PLANNERS HOW MUCH WILL WE **SELL** TOMORROW?

QUANT TRADERS HOW MUCH **RETURN** WILL I GET ON A STOCK?

CREDIT RISK ANALYSTS WHAT IS THE **RISK** OF A CUSTOMER DEFAULTING?

INSURANCE PROVIDERS WHAT IS THE **RISK** THAT THIS POLICY WILL BE CLAIMED?

**REGRESSION HELPS YOU PREDICT THE VALUE
OF ONE VARIABLE USING OTHER VARIABLES**

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LET'S TAKE THE EXAMPLE OF **DEMAND PLANNING**

YOU WANT TO PREDICT
THE **SALES FOR THE
COMING MONTH**

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YOU WANT TO PREDICT THE **SALES FOR THE COMING MONTH**

THIS MIGHT DEPEND
ON **A BUNCH OF
DIFFERENT THINGS**

LET'S TAKE THE EXAMPLE OF DEMAND PLANNING

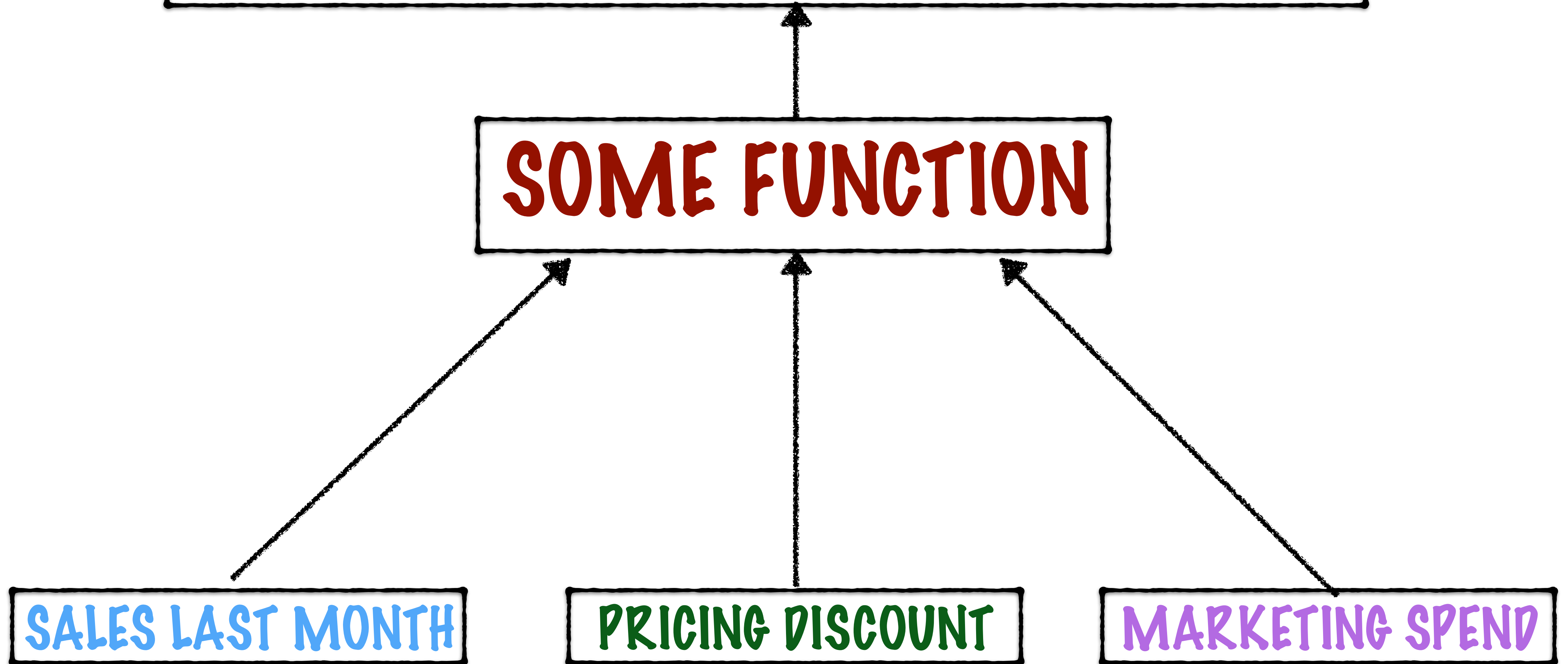
SALES FOR THE COMING MONTH

SOME FUNCTION

SALES LAST MONTH

PRICING DISCOUNT

MARKETING SPEND



LET'S TAKE THE EXAMPLE OF DEMAND PLANNING

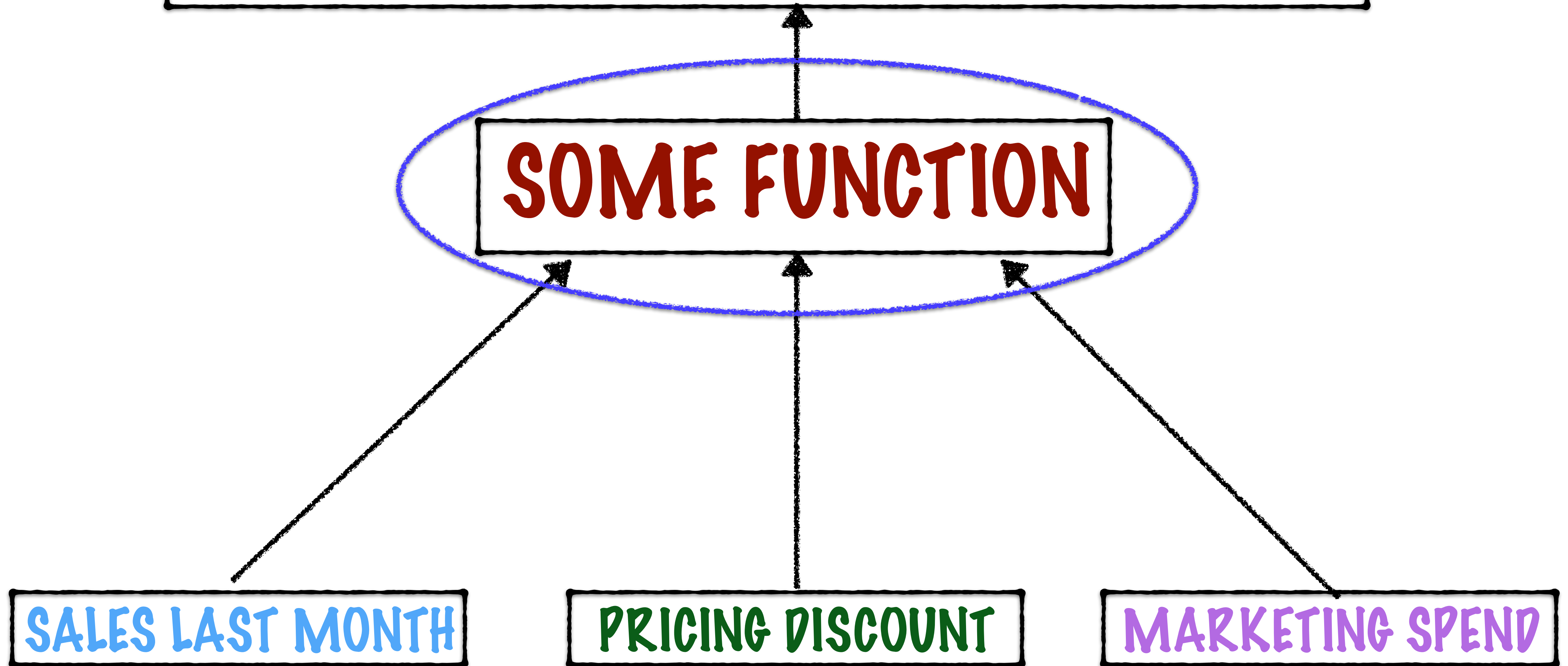
SALES FOR THE COMING MONTH

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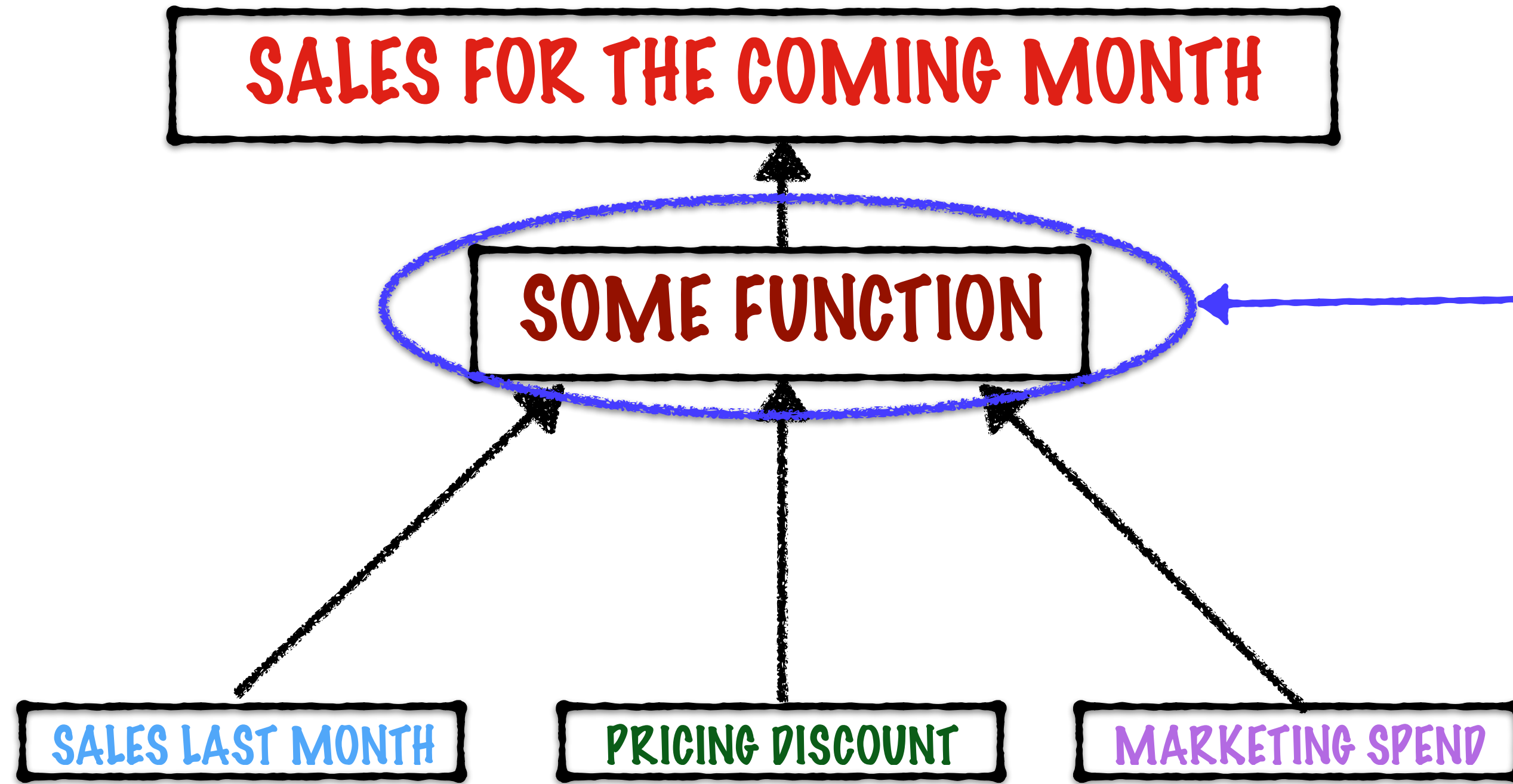
SALES LAST MONTH

PRICING DISCOUNT

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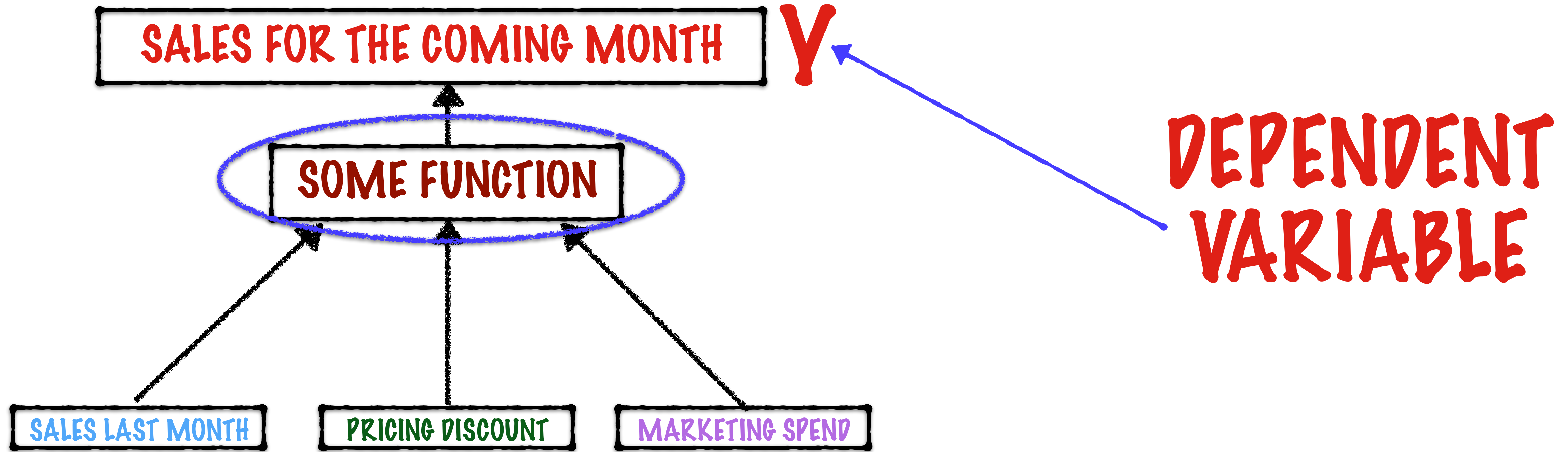


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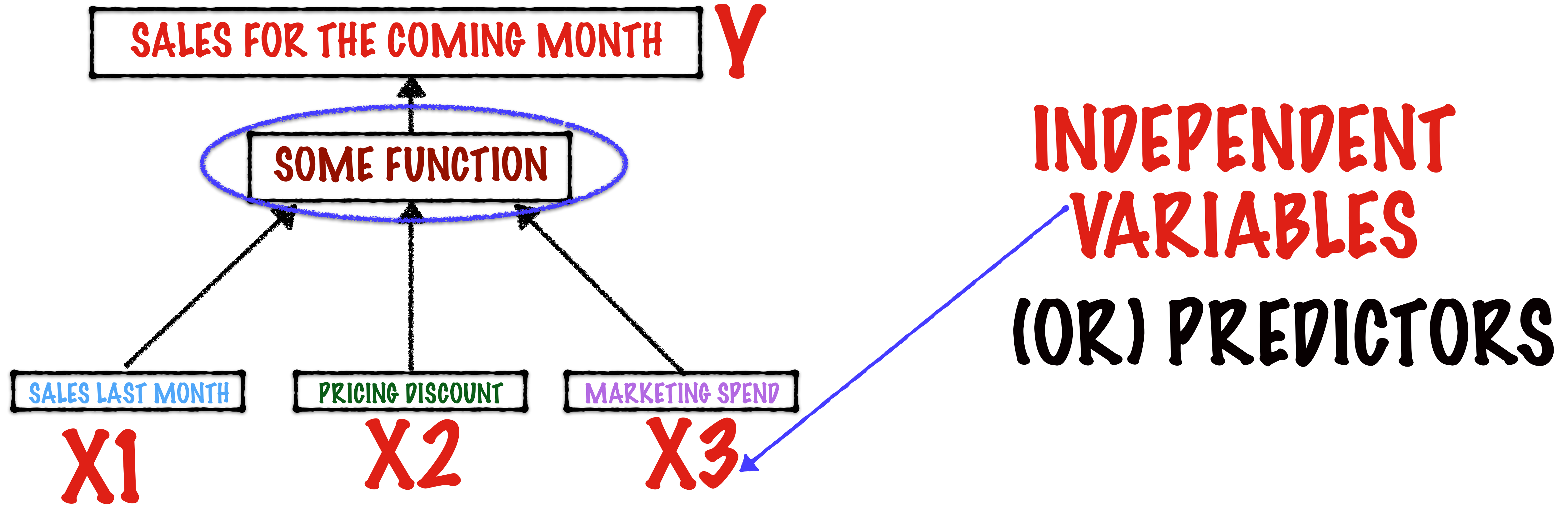


REGRESSION IS
THE PROCESS
THAT **FINDS**
THIS FUNCTION

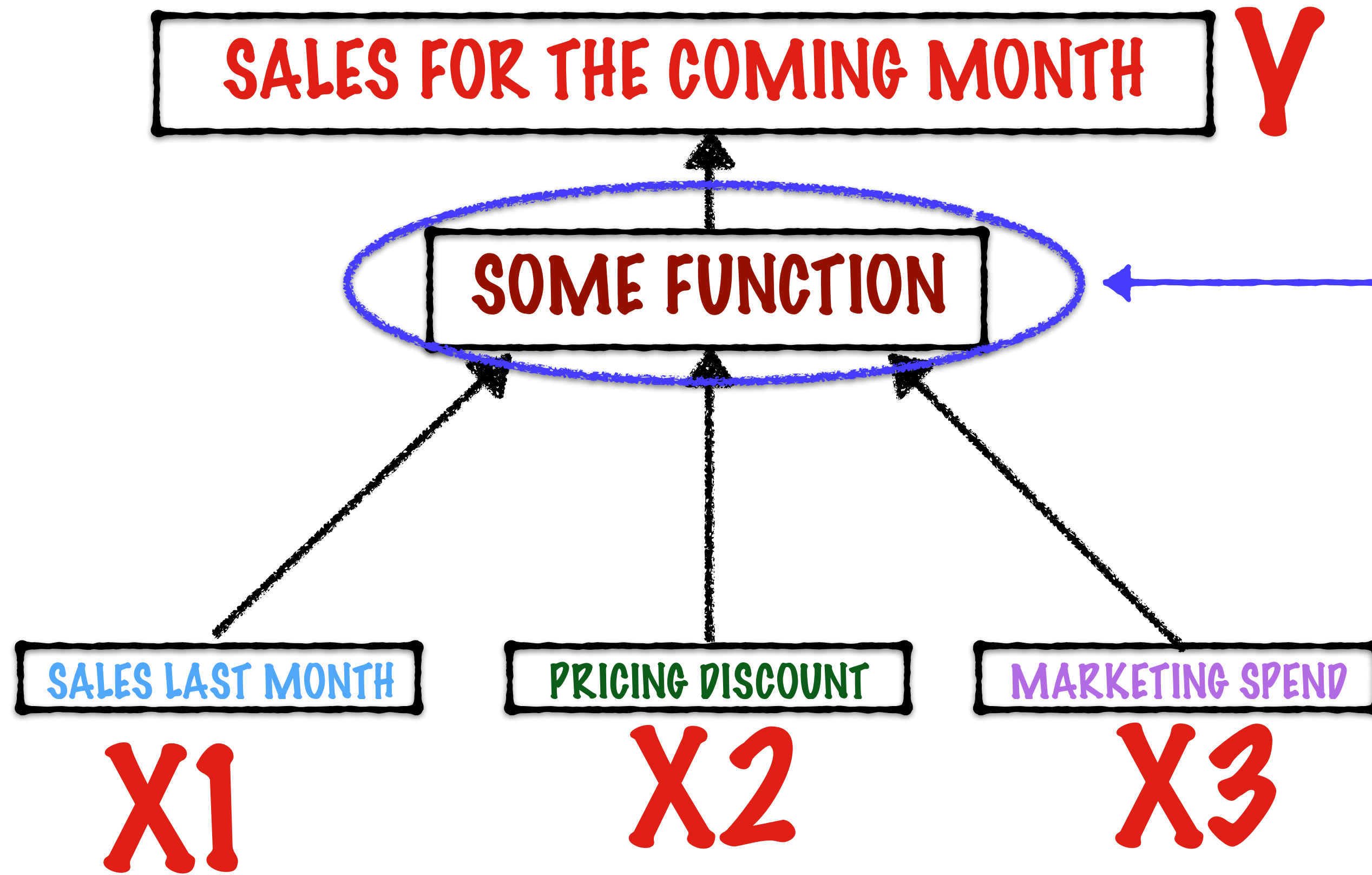
LET'S TAKE THE EXAMPLE OF DEMAND PLANNING



LET'S TAKE THE EXAMPLE OF DEMAND PLANNING



LET'S TAKE THE EXAMPLE OF DEMAND PLANNING



$$Y = F(X1, X2, X3)$$

HOW DOES
REGRESSION
FIND THIS
FUNCTION?

$$Y = F(X_1, X_2, X_3)$$

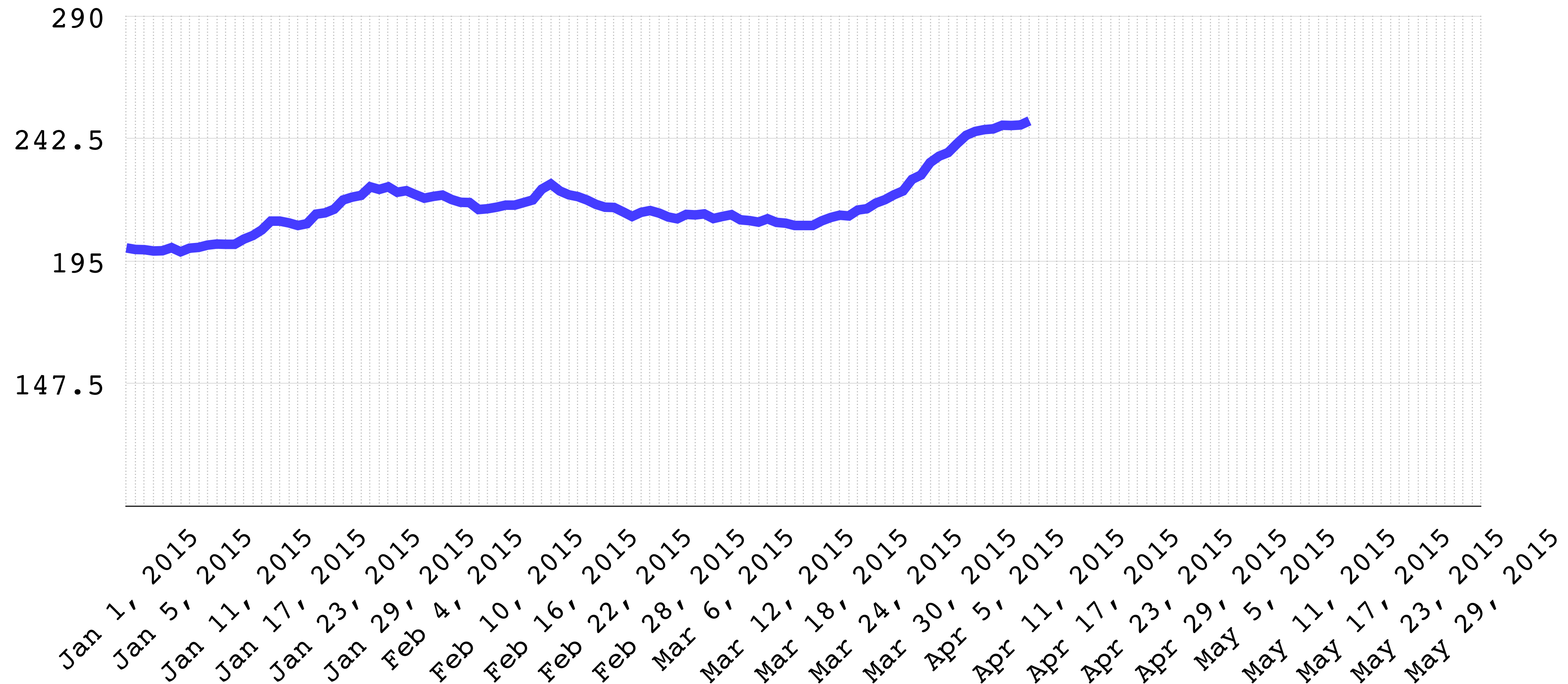
HOW DOES REGRESSION FIND THIS FUNCTION?

USING PAST DATA

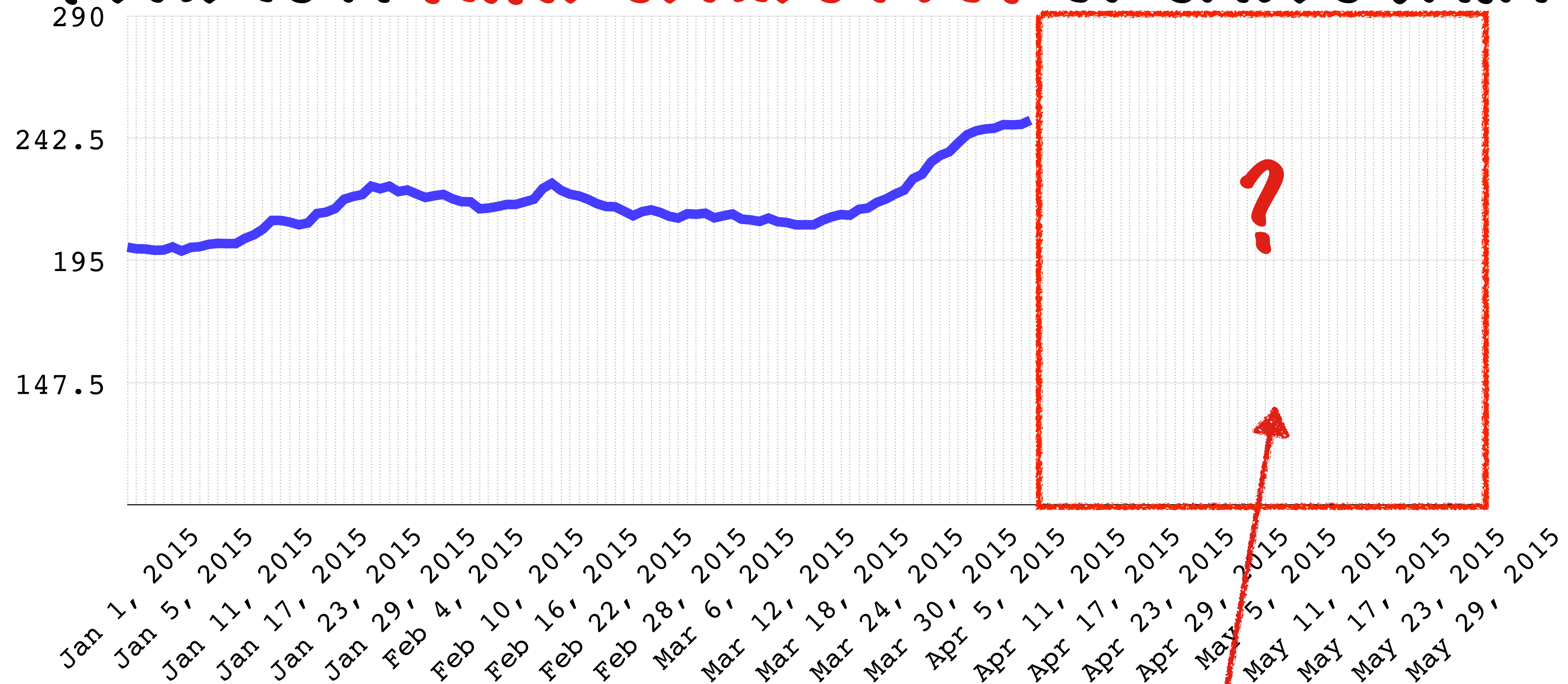
$$Y = F(X_1, X_2, X_3)$$

HOW DOES REGRESSION FIND THIS FUNCTION?

HERE IS A **TIME SERIES PLOT** OF SALES DATA

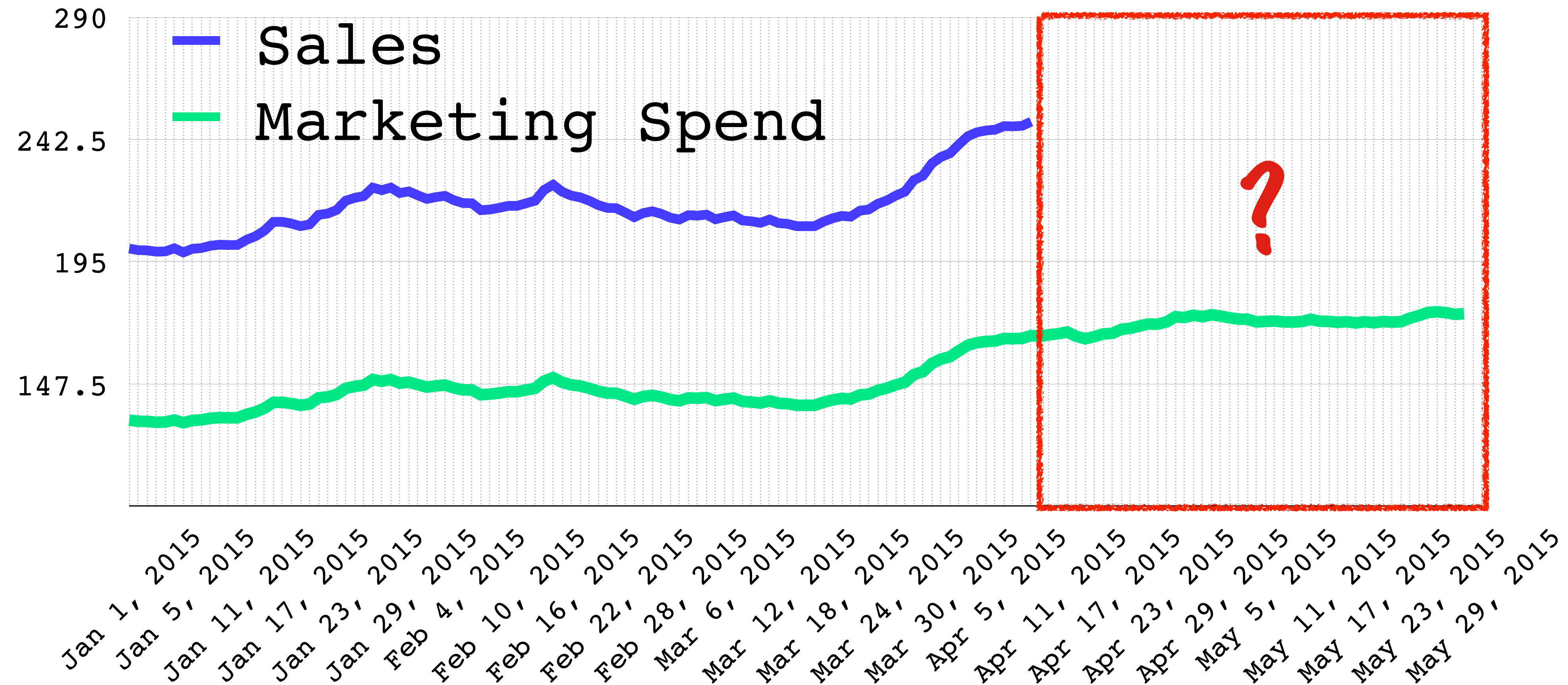


HERE IS A **TIME SERIES PLOT** OF SALES DATA



THE **OBJECTIVE** IS TO FIGURE OUT WHAT
THIS WILL BE IN THE **FUTURE**

HERE IS A **TIME SERIES PLOT** OF SALES DATA



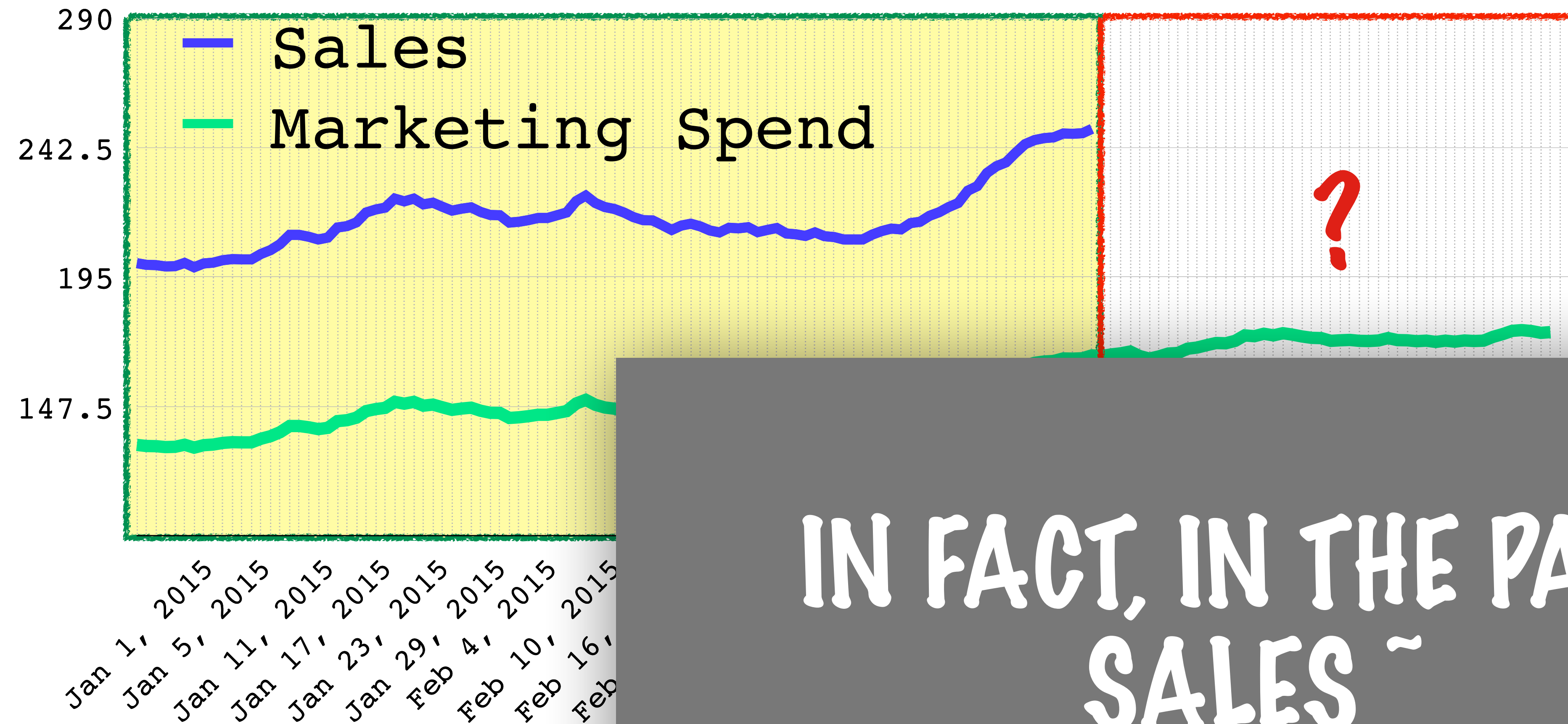
HERE IS THE **MARKETING SPEND** FOR THIS PERIOD

HERE IS A **TIME SERIES PLOT** OF SALES DATA



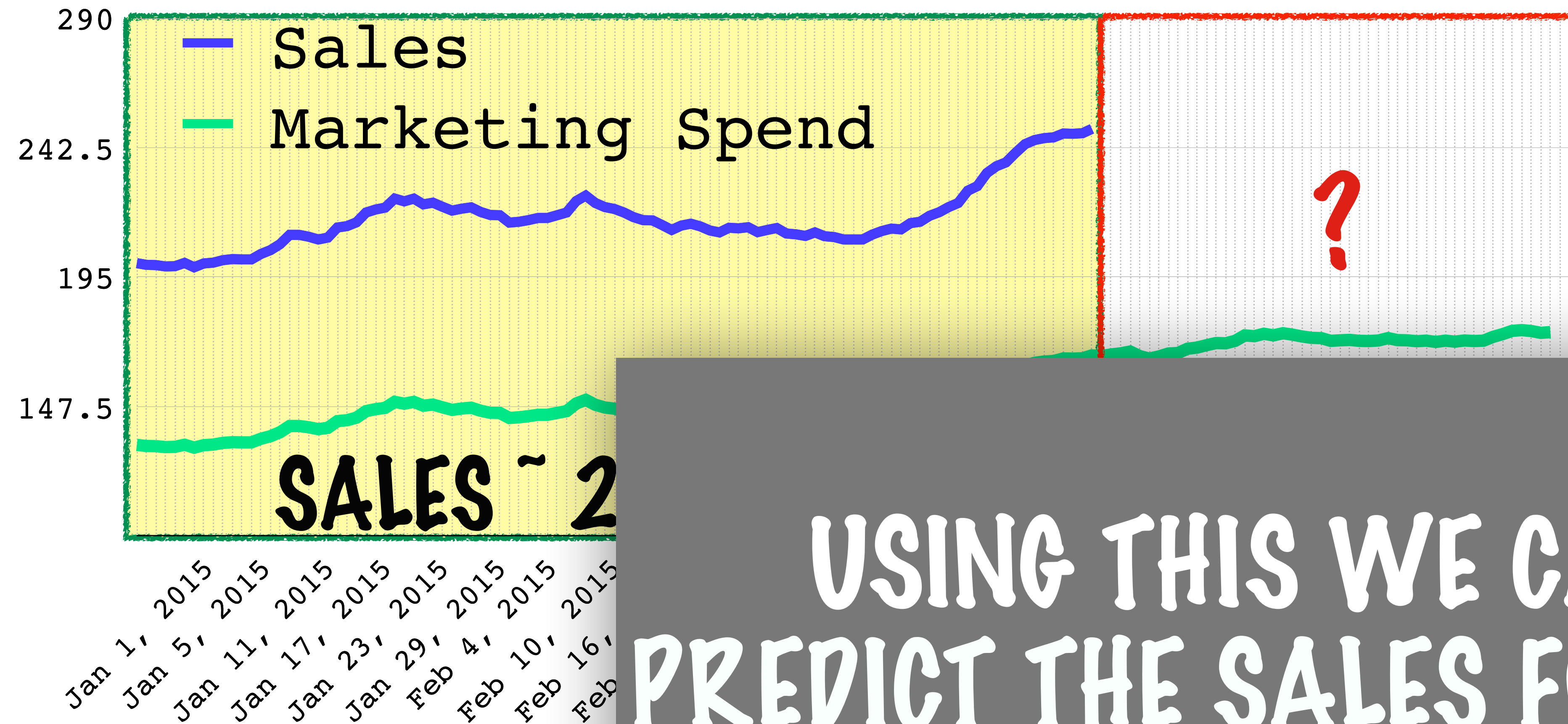
BY EXAMINING THE PAST,
WE CAN SEE THAT SALES
AND MARKETING SPEND
ARE CORRELATED

HERE IS A **TIME SERIES PLOT** OF SALES DATA



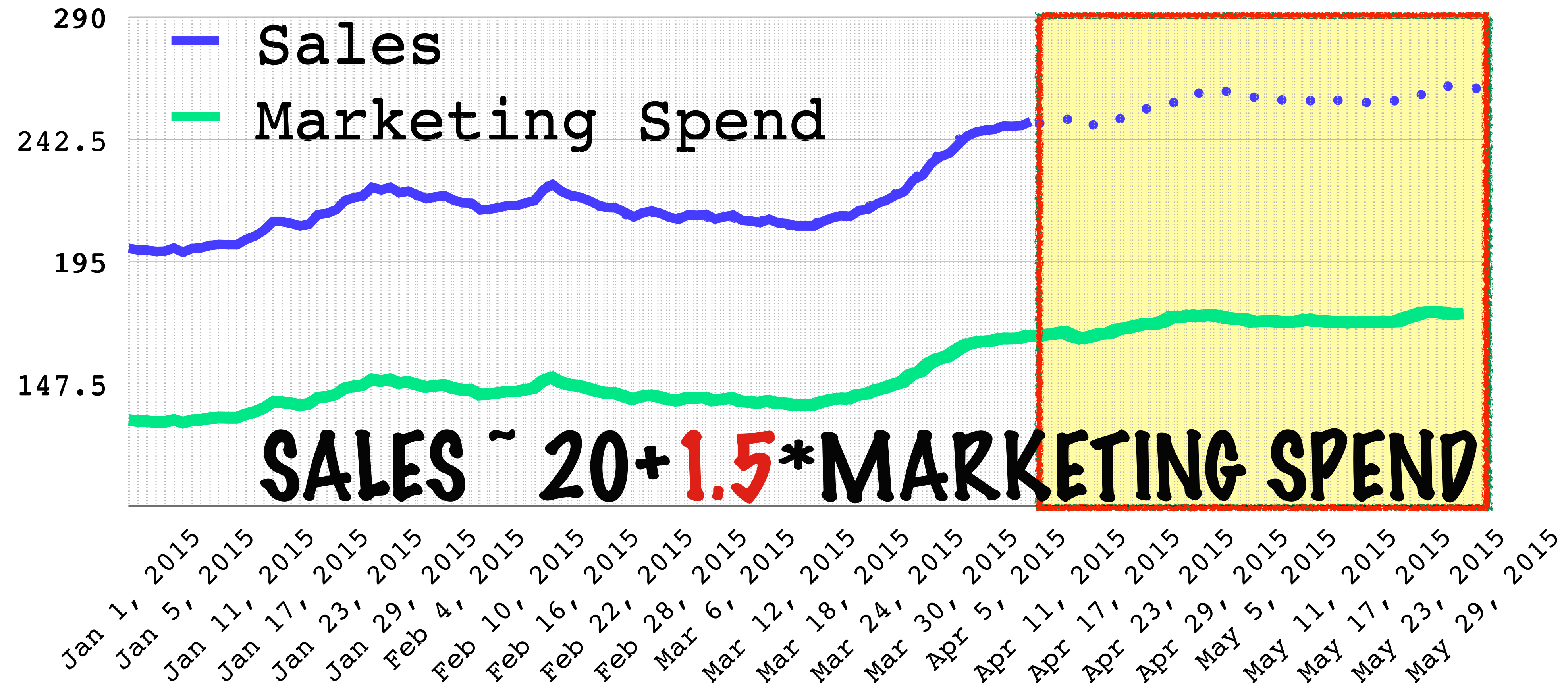
IN FACT, IN THE PAST
SALES ~
 $20 + 1.5 * \text{MARKETING SPEND}$

HERE IS A **TIME SERIES PLOT** OF SALES DATA



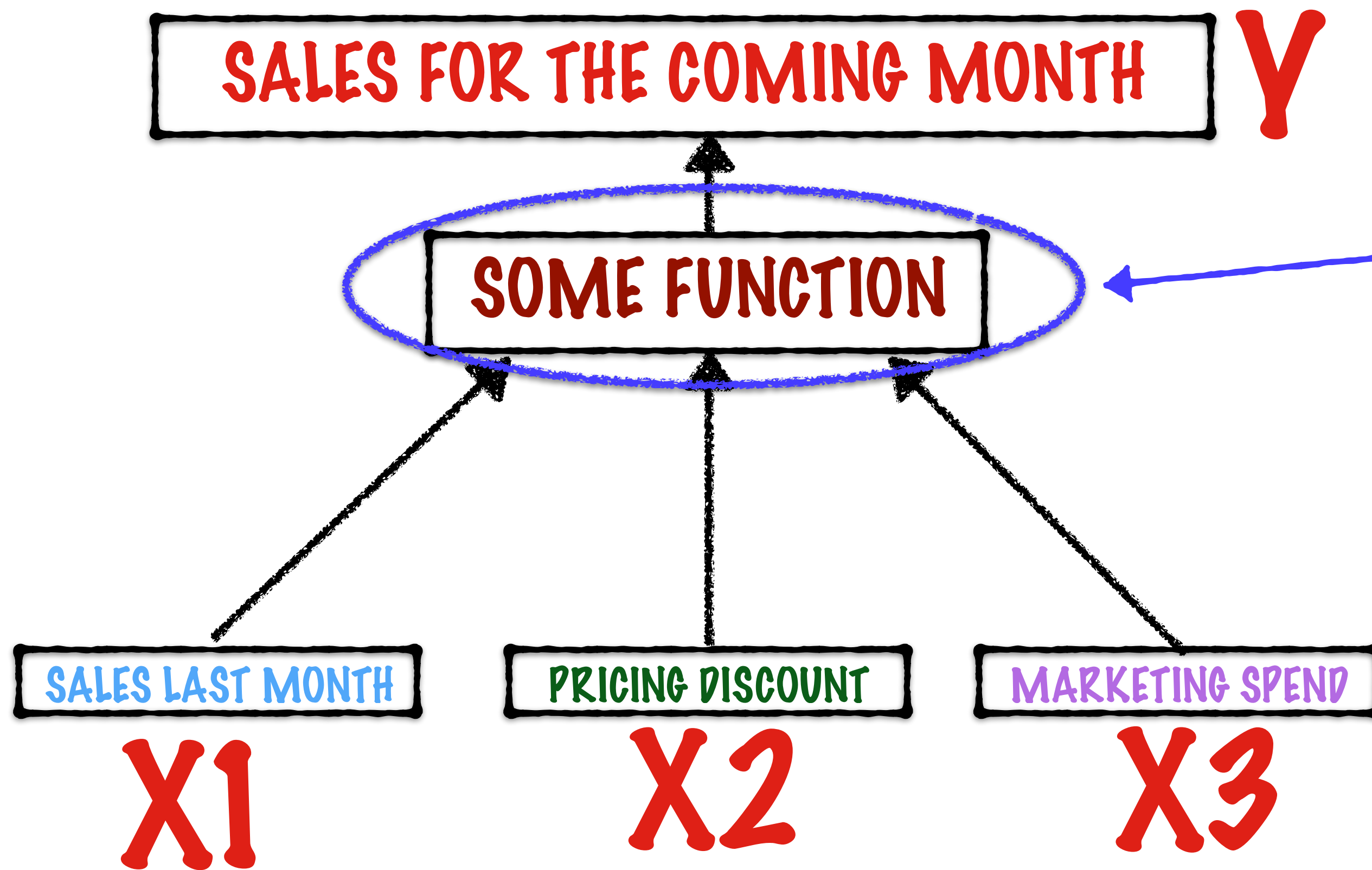
USING THIS WE CAN
PREDICT THE SALES FOR THE
FUTURE

HERE IS A **TIME SERIES PLOT** OF SALES DATA



THIS IS EXACTLY WHAT HAPPENS IN
REGRESSION

REGRESSION



$$Y = F(X1, X2, X3)$$

AS WE SAW IN THE
EXAMPLE, **REGRESSION**
USES PAST DATA TO
IDENTIFY A FUNCTION

THIS FUNCTION IS
CALLED **THE MODEL**

REGRESSION

$$Y = F(X_1, X_2, \dots)$$

THE REGRESSION PROCESS STARTS
BY **MAKING AN ASSUMPTION**
ABOUT THE **TYPE OF FUNCTION** WE
ARE GOING TO FIND

REGRESSION

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IF WE ASSUME THAT THE RELATIONSHIP
BETWEEN THE VARIABLES IS LINEAR,
THEN THE PROCESS IS CALLED

LINEAR REGRESSION