# Problem Statement

Create a user-friendly program that can rank investments from best to worst (A to F) based on the ROI (return on investment). The program should be able to take in any number of investments and prompt the user for the necessary information including Property Address, Purchase Price, Year built, Property Size, Monthly rent, Annual Property Tax, Down Payment, and Interest rate.

Using this input, the program should calculate the Annual Gross Income, Property management cost, Interest Payment, Insurance cost, and Maintenance cost. The Annual profit should then be calculated by subtracting all expenses from the rental income.

The program should then use the ROI to determine the ranking of the investment and display a report with all the details including the property ranking. The insurance rate should be calculated as 0.5% plus 0.1% for every 5 years of property age, while maintenance cost should be calculated as $1.25 per square feet plus $0.25 for every 5 years of property age.

Overall, the program should be able to provide a comprehensive report that helps users compare and select the best investment for their money.

# Nouns and Verbs

**Nouns:**

Ranking A-F, multiple investments, Property Address, Purchase Price, Year Built, Property Size, Monthly Rent, Property Tax, Down Payment, Interest Rate, Annual Gross income, Property Management, Interest Payment, Insurance, Maintenance, Annual Profit, ROI, comprehensive report.

**Verbs:**

Prompt, calculate, display

# Defining Diagram

**INPUTS:**

Property Address

Purchase Price

Year Built

Property Size

Monthly Rent

Annual Property Tax

Down Payment

Interest Rate

**PROCESSING:**

Annual Gross Income Calculation

Property Management Calculation

Interest Payment Calculation

Insurance Calculation

Maintenance Calculation

Annual Profit Calculation

Investment Ranking Calculation

**OUTPUT:**

Investment Ranking

Investment Report

# Solution Algorithm

InvestemnetRankingCaculater

Begin

Create a loop WHILE user entry = “y” Do:

Initialize address = “”

Initialize purchasePrice = 0

Initialize yearBuilt = 0

Initialize size = 0

Initialize rentalPrice = 0

Initialize rentalIncome = 0

Initialize annualProfit = 0

Initialize ROI = 0

Initialize propertyRanking = ""

Initialize propertyTax = 0

Initialize intrestPayment = 0

Initialize insurance = 0

Initialize maintenance = 0

Initialize vacancy = 0.05

Initialize propertyManagement = 0

Initialize downPayment = 0

Initialize interestRate = 0

Initialize currentYear = 0

Initialize propertyAge = 0

Initialize insuranceRate = 0

Initialize maintenanceRatePerSquareFeet = 0

Initialize errorMessage = "This is not a valid entry"

Prompt for address

Prompt for purchasePrice

Prompt for yearBuilt

Prompt for size

Prompt for rentalPrice

Prompt for propertyTax

Prompt for downPayment

Prompt for interestRate

Calculate rentalIncome  = (rentaPrice \* 12) \* (1 - vacancy)

Calculate propertyManagement  = rentalIncome \* 7%

Calculate interestPayment  = purchasePrice - downPayment) \* (interestRate/100)

Calculate propertyAge = currentYear - yearBuilt

Calculate insuranceRate  = 0.005 + (0.001 \* (propertyAge / 5))

Calculate insurance = purchasePrice \* insuranceRate

Calculate maintenanceRatePerSquareFeet = 1.25 + (0.25 \*(propertyAge / 5)

Calculate maintenance = maintenanceRatePerSquareFeet \* size

Calculate annualProfit = rentalIncome - propertyManagement - propertyTax - intrestPayment - insurance - maintenance

Calculate ROI = annualProfit/ purchasePrice

Calculate propertyRanking :

If ROI > 0.10 THEN  set propertyRanking = “A”

If ROI > 0.07 THEN  set propertyRanking = “B”

If ROI > 0.04 THEN  set propertyRanking = “C”

If ROI > 0.01 THEN  set propertyRanking = “D”

If ROI <= 0.01 THEN  set propertyRanking = “F”

Display:

“Here is what you entered:”

“Purchase price : “purchasePrice

“Year built:” yearBuilt

“Size: “ size

“Monthly Rent Price: “ rentaPrice

“Annual Rental Income: “ rentalIncome

“Down Payment: “ downPayment

“Interest Rate: “ interestRate

“Here is what we calculated for you:”

“The estimate Annual Gross Income is: “ rentalIncome

“Property Tax: “ propertyTax

“Property Management fees: “ propertyManagement

“Interest Payment: “ intrestPayment

“Insurance Payment: “ insurance

“Maintenance: “ maintenance

"The estimate annual Expenses is: “ propertyManagement + propertyTax +         interestPayment + insurance + maintenance

"The expected annual profit is: “ annualProfit

"The return on investment is: “ ROI

END

# Checking the Solution Algorithm

TEST CASE 1

INPUT VALUES:

address: Main Street

purchasePrice: 200000

yearBuilt: 2010

size: 1800

rentalPrice: 1800

propertyTax: 2600

downPayment: 60000

interestRate : 5

loopTest : y

TEST CASE 2

INPUT VALUES:

address: Golf Rd

purchasePrice: 250000

yearBuilt: 2020

size: 2200

rentalPrice: 2800

propertyTax: 2600

downPayment: 80000

interestRate : 5

loopTest : y

TEST CASE 3

INPUT VALUES:

address: Awesome Dr

purchasePrice: 300000

yearBuilt: 2023

size: 2400

rentalPrice: 4800

propertyTax:

downPayment: 120000

interestRate : 5

loopTest : n

**EXPECTED RESULT:**

**We rank Main Street investment opportunity as a:**

**D**

**Here is what you entered:**

**Purchase Price:                      $200000**

**Year Built:                           2010**

**Size:                                 1800 sq ft**

**Monthly rent price:                  $1800**

**Annual Rental Income:                $20520**

**Down Payment:                        $60000**

**Interest rate:                        5%**

**Here is what we calculated for you:**

**The estimate Annual Gross Income is: $20520**

**Property Tax:                       ($2600)**

**Property Management fees:           ($1436)**

**Interest Payment:                   ($7000)**

**Insurance Payment:                  ($1400)**

**Maintenance:                        ($3600)**

**The estimate annual Expenses is:       $16036**

**The expected annual profit is:         $4484**

**The return on investment is:            2.24%**

**We rank Golf Rd investment opportunity as a:**

**C**

**Here is what you entered:**

**Purchase Price:                      $250000**

**Year Built:                           2020**

**Size:                                 2200 sq ft**

**Monthly rent price:                  $2800**

**Annual Rental Income:                $31920**

**Down Payment:                        $80000**

**Interest rate:                        5%**

**Here is what we calculated for you:**

**The estimate Annual Gross Income is: $31920**

**Property Tax:                       ($2600)**

**Property Management fees:           ($2234)**

**Interest Payment:                   ($8500)**

**Insurance Payment:                  ($1250)**

**Maintenance:                        ($2200)**

**The estimate annual Expenses is:       $16784**

**The expected annual profit is:         $15136**

**The return on investment is:            6.05%**

**We rank Awesome Dr investment opportunity as a:**

**A**

**Here is what you entered:**

**Purchase Price:                      $300000**

**Year Built:                           2023**

**Size:                                 2400 sq ft**

**Monthly rent price:                  $4800**

**Annual Rental Income:                $54720**

**Down Payment:                        $120000**

**Interest rate:                        5%**

**Here is what we calculated for you:**

**The estimate Annual Gross Income is: $54720**

**Property Tax:                       ($3000)**

**Property Management fees:           ($3830)**

**Interest Payment:                   ($9000)**

**Insurance Payment:                  ($1500)**

**Maintenance:                        ($2400)**

**The estimate annual Expenses is:       $19730**

**The expected annual profit is:         $34990**

**The return on investment is:            11.66%**

**ACTUAL RESULT:**

**We rank Main Street investment opportunity as a:**

**D**

**Here is what you entered:**

**Purchase Price:                      $200000**

**Year Built:                           2010**

**Size:                                 1800 sq ft**

**Monthly rent price:                  $1800**

**Annual Rental Income:                $20520**

**Down Payment:                        $60000**

**Interest rate:                        5%**

**Here is what we calculated for you:**

**The estimate Annual Gross Income is: $20520**

**Property Tax:                       ($2600)**

**Property Management fees:           ($1436)**

**Interest Payment:                   ($7000)**

**Insurance Payment:                  ($1400)**

**Maintenance:                        ($3600)**

**The estimate annual Expenses is:       $16036**

**The expected annual profit is:         $4484**

**The return on investment is:            2.24%**

**We rank Golf Rd investment opportunity as a:**

**C**

**Here is what you entered:**

**Purchase Price:                      $250000**

**Year Built:                           2020**

**Size:                                 2200 sq ft**

**Monthly rent price:                  $2800**

**Annual Rental Income:                $31920**

**Down Payment:                        $80000**

**Interest rate:                        5%**

**Here is what we calculated for you:**

**The estimate Annual Gross Income is: $31920**

**Property Tax:                       ($2600)**

**Property Management fees:           ($2234)**

**Interest Payment:                   ($8500)**

**Insurance Payment:                  ($1250)**

**Maintenance:                        ($2200)**

**The estimate annual Expenses is:       $16784**

**The expected annual profit is:         $15136**

**The return on investment is:            6.05%**

**We rank Awesome Dr investment opportunity as a:**

**A**

**Here is what you entered:**

**Purchase Price:                      $300000**

**Year Built:                           2023**

**Size:                                 2400 sq ft**

**Monthly rent price:                  $4800**

**Annual Rental Income:                $54720**

**Down Payment:                        $120000**

**Interest rate:                        5%**

**Here is what we calculated for you:**

**The estimate Annual Gross Income is: $54720**

**Property Tax:                       ($3000)**

**Property Management fees:           ($3830)**

**Interest Payment:                   ($9000)**

**Insurance Payment:                  ($1500)**

**Maintenance:                        ($2400)**

**The estimate annual Expenses is:       $19730**

**The expected annual profit is:         $34990**

**The return on investment is:            11.66%**