**Investor class**

*Displays bond values: sum of discounted payments, using inflation rate r:*

getValue(double inflationRate, int numberOfYears, double sum) :double

double rate

value = sum /(1+ inflationRate)^numberOfYears

return rate

query getValue(double inflationRate, int numberOfYears, double sum) : double

post:

value = sum/(1+inflationRate)^numberOfYears

*System calculates and shows its Macaulay duration for rate r:*

getDuration(): double or time

double or time duration

duration =for sum of payments calculate payment.time multiplied by coupon / (1+r)^payment.time + term\*100/(1+r)^term) /value

return duration

query getDuration() : double

post:

duration = ((payment time \* coupon)/(1+r)^payment time) + (term \* 100)/(1+r)^term))/value

*Returns duration*

getDuration(): time

return duration

query getDuration(): time

post:

duration

*Returns payout*

getPayout(): double

double result = payments->collect(amount)->sum()

return result

query getPayout(): double

post:

result = payments -> collect(amount) -> sum()

*Investor can purchase bonds which are added into a list*

purchase(Bond bond): void

add bond to investors array list

query purchase(Bond bond) : void

post:

*Returns all bonds held by an investor*

getBondsOwnded():Bond[]

return bond array

**Bond class**

*Constructor*

Bond(int term, double coupon, int frequencyOfPayment, date purchaseDate, string name, double price):void

this.term = term, this.coupon =coupon, this.frequencyOfPayment = frequencyOfPayment, this.purchaseDate = purchaseDate, this.name = name, this.price =price

*System calculates and shows its Macaulay duration for rate r:*

getDuration():time

time duration

duration =for sum of payments calculate payment.time multiplied by coupon / (1+r)^payment.time + term\*100/(1+r)^term) /value

return duration

query getDuration() : double

post:

duration = ((payment time \* coupon)/(1+r)^payment time) + (term \* 100)/(1+r)^term))/value

*Returns internal rate of return*

getInternalRateOfReduction():double

double price

price = for the sum of payments calculate coupon/(1+r)^term

return price

query getInternalRateOfReduction(): double

post:

price = (coupon)/((1+r)^payment time) + (100/(1+r)^term)

*Returns payout*

getPayout(): double

double result = payments->collect(amount)->sum()

return result  
query getPayout(): double

post:

result = payments -> collect(amount) -> sum()

*The date the bond was bought by an investor*

setDate(Date date) :void

*Displays bond values: sum of discounted payments, using inflation rate r:*

getValue(double inflationRate, int numberOfYears, double sum) :double

double rate

value = sum /(1+ inflationRate)^numberOfYears

return rate

query getValue(double inflationRate, int numberOfYears, double sum): double

post:

value = sum/(1+inflationRate)^numberOfYears