

The University of Texas at El Paso  
Department of Computer Science  
CS 1101 – Comprehensive Lab 2  
Fall 2020  
Mortgage Loans



**Deadlines:**

- Pseudocode – November 4, 2020 @ 5pm – Students must demo their pseudocode – after this deadline, up to 50% credit on pseudocode will be given
- Final Submission – November 11, 2020 @ 11:59pm on Blackboard

Buying a new home is a major life decision that many people make. In many cases, buying a house is a necessary part of life, especially when building a career and family. There are many aspects when it comes to buying a house and it can often be overwhelming.

When a bank or credit lender considers a person for a loan, they need basic information including:

- First Name
  - Last Name
  - Annual Gross (Before Taxes) Income (nearest dollar)
  - Total Savings (nearest dollar)
  - Credit Score (range 300-850)
  - Number of years for loan (15 or 30 years)
  - Desired Home Value (nearest dollar)
1. Write a method called ***calculateInterestRate*** – Interest rates will be determined by a user's credit score
    - a. Interest Rate
      - i. Credit Score 800-850 – 2.8% - .028 interest rate
      - ii. Credit Score 740-799 – 3.0% - .03 interest rate
      - iii. Credit Score 670-739 – 3.2% - .032 interest rate
      - iv. Credit Score 580-559 – 3.5% - .035 interest rate
      - v. Credit Score 300-579 – 4% - .04 interest rate
  2. Write a method called ***calculateDownPayment*** – down payment will be determined by a user's credit score
    - a. Down payment based on credit score
      - i. Credit Score 800-850 – Down payment 5% of home value
      - ii. Credit Score 740-799 – Down payment 7% of home value
      - iii. Credit Score 670-739 – Down payment 10% of home value
      - iv. Credit Score 580-559 – Down payment 15% of home value
      - v. Credit Score 300-579 – Down payment 20% of home value
  3. Write a method called ***estimateMonthlyPayment*** using the following formula – monthly payment takes into consideration the value being financed (total loan), monthly rate (interest rate/12), and total months of the loan:

- a. Total Loan

$$\text{totalLoan} = \text{HomeValue} - \text{DownPayment}$$

- b. Monthly Rate

$$\text{monthlyRate} = \text{interestRate} / 12$$

- c. Total Months

- i. 15 years – 180 months
- ii. 30 years – 360 months

- d. Monthly payment is determined by the following formula:

$$\text{payment} = \frac{\text{totalLoan} * (\text{monthlyRate} * (1 + \text{monthlyRate})^{\text{totalMonths}})}{(1 + \text{monthlyRate})^{\text{totalMonths}} - 1}$$

4. Write a method called *isLoanApproved* – Mortgage loans are approved based on the following criteria:

- a. Home price must not be more than 3.5 times the gross annual income
- b. Meet the following credit score to amount saved:
  - i. Credit Score 800-850 – Savings 5% of home value
  - ii. Credit Score 740-799 – Savings 7% of home value
  - iii. Credit Score 670-739 – Savings 10% of home value
  - iv. Credit Score 580-559 – Savings 15% of home value
  - v. Credit Score 300-579 – Savings 20% of home value
- c. Meet the following net income to home value restrictions:
  - i. Estimated monthly payment is less than 42% of your net monthly income (12-months in a year)
    - 1. Net income is your actual paycheck (what is deposited in your bank account) after taxes, insurance, retirement, etc. have been withheld/paid
    - 2. For this assignment, let's assume that your withholdings are 32%. This means that your net income will be 68% of your gross income

5. Create a menu with the following options

- a. Loan Approval Calculator
- b. Monthly payment calculator
- c. Loan Approval Reader

6. Loan Approval Calculator will ask for user input and display a message if the user is approved/denied

- a. First Name
- b. Last Name
- c. Annual Gross (Before Taxes) Income (nearest dollar)
- d. Total Savings (nearest dollar)

- e. Credit Score (range 300-850)
  - f. Desired Home Value (nearest dollar)
  - g. Total Months (15 years – 180 months, 30 years – 360 months)
7. Monthly Payment Calculator will ask the user to input information and a message will be displayed with the estimated monthly payment
- a. Credit Score (range 300-850)
  - b. Desired Home Value (nearest dollar)
  - c. Total Months (15 years – 180 months, 30 years – 360 months)
8. Loan approval reader will read from a CSV file and for each person
- a. Print the following information:
    - i. First & Last Name
    - ii. Approval Status (Approved/Denied)
      - 1. If approved – estimated monthly payment
      - 2. If denied – “Monthly payment not available”
  - b. For each person in the CSV file, add an Approved/Denied entry in an array (up to the total number of entries in the CSV files)
  - c. Write a method *printLoanDecisions* – use the array with the approved and denied loans
    - i. Print the number of approved loans
    - ii. Print the number of denied loans
  - d. Run *printLoanDecisions*

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Hello, Welcome to the Mortgage Loans Information Portal

What would you like to do today? Enter the number that matches your choice

- 1. Loan Approval Calculator
- 2. Monthly Payment Calculator
- 3. Loan Approval Reader (From File)
- 4. Exit

1

What is your first name

Mickey

What is your last name

Mouse

What is your Annual Gross (Before Taxes) Income (nearest dollar)

90000

What is your total savings (nearest dollar)

40000

What is your Credit Score

820

What is your Desired Home Value

250000

What is the total length of the loan? 180 or 360 months? (15 or 30 yrs)

360

Congratulations, Mickey Mouse! You have been APPROVED for a mortgage loan!

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What would you like to do today? Enter the number that matches your choice

1. Loan Approval Calculator
2. Monthly Payment Calculator
3. Loan Approval Reader (From File)
4. Exit

1

What is your first name?

Scar

What is your last name?

Disney

What is your Annual Gross (Before Taxes) Income (nearest dollar)?

60000

What is your total savings (nearest dollar)?

23450

What is your Credit Score?

630

What is your Desired Home Value?



250000

What is the total length of the loan? 180 or 360 months? (15 or 30 yrs)?

360

Sorry, Scar Disney! You have been DENIED for a mortgage loan!

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What would you like to do today? Enter the number that matches your choice

1. Loan Approval Calculator
2. Monthly Payment Calculator
3. Loan Approval Reader (From File)
4. Exit

2

What is your Credit Score

735

What is your Desired Home Value

180000

What is the total length of the loan in months? 180 or 360 months? (15 or 30 yrs)

180

The estimated monthly payment (before Taxes/Insurance) is: \$1,134.39

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What would you like to do today? Enter the number that matches your choice

1. Loan Approval Calculator
2. Monthly Payment Calculator
3. Loan Approval Reader (From File)
4. Exit

2

What is your Credit Score

480

What is your Desired Home Value

100000

What is the total length of the loan in months? 180 or 360 months? (15 or 30 yrs)

360

The estimated monthly payment (before Taxes/Insurance) is: \$381.93

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What would you like to do today? Enter the number that matches your choice

1. Loan Approval Calculator
2. Monthly Payment Calculator
3. Loan Approval Reader (From File)
4. Exit

3



Congratulations, Mickey Mouse! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$775.06

Sorry, Donald Duck! You have been DENIED for a mortgage loan!

Congratulations, Minnie Mouse! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$1,239.46



Sorry, Goofy Disney! You have been DENIED for a mortgage loan!

Sorry, Pluto Disney! You have been DENIED for a mortgage loan!

Sorry, Chip Disney! You have been DENIED for a mortgage loan!



Congratulations, Dale Disney! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$1,133.58

Sorry, Cinderella Disney! You have been DENIED for a mortgage loan!

Sorry, Ariel Disney! You have been DENIED for a mortgage loan!

Congratulations, Jasmine Disney! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$1,283.38

Sorry, Aladdin Disney! You have been DENIED for a mortgage loan!

Sorry, Simba Disney! You have been DENIED for a mortgage loan!

Sorry, Mufassa Disney! You have been DENIED for a mortgage loan!

Congratulations, Aurora Disney! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$1,016.83

Sorry, Peter Pan! You have been DENIED for a mortgage loan!

Sorry, Woody Disney! You have been DENIED for a mortgage loan!

Congratulations, Buzz Lightyear! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$876.57

Sorry, Jafar Aladdin! You have been DENIED for a mortgage loan!

Sorry, Ursula Mermaid! You have been DENIED for a mortgage loan!

Sorry, Beast Disney! You have been DENIED for a mortgage loan!

Sorry, Belle Disney! You have been DENIED for a mortgage loan!

Sorry, Cruella De Vil! You have been DENIED for a mortgage loan!

Sorry, Scar Lion! You have been DENIED for a mortgage loan!

Sorry, Simba King! You have been DENIED for a mortgage loan!

Sorry, Gaston Disney! You have been DENIED for a mortgage loan!



Congratulations, Shere Khan! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$871.72

Sorry, Captaiin Hook! You have been DENIED for a mortgage loan!



Congratulations, Kaa Disney! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$1,093.31

Sorry, Evil Queen! You have been DENIED for a mortgage loan!

Congratulations, Pinocchio Disney! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$920.92

Sorry, Prince Eric! You have been DENIED for a mortgage loan!



Sorry, Quasimodo Disney! You have been DENIED for a mortgage loan!



Congratulations, Hercules Disney! You have been APPROVED for a mortgage loan!

The estimated monthly payment (before Taxes/Insurance) is: \$726.31

Sorry, Mulan Disney! You have been DENIED for a mortgage loan!

Sorry, Lilo Disney! You have been DENIED for a mortgage loan!

Sorry, Stitch Disney! You have been DENIED for a mortgage loan!

Total Applications APPROVED: 10

Total Applications DENIED: 26

## Grade percentage breakdown

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- 10% - Pseudocode
- 10% - Appropriate use of input/output operations (in Java)
- 10% - Appropriate use of conditional (i.e., if-then) statements (in Java)
- 10% - Appropriate use of iterations (i.e., for-loop, while-loop) statements (in Java)
- 15% - Appropriate use of methods (i.e. parameters, return type, calling, returning)
- 5% - Appropriate use of arrays
- 10% - Appropriate documentation (in Java)
- 10% - Appropriate notation and indentation (in Java)
- 15% - Program compiles, runs, and contains the functionality required
- 5% - Student answers all questions during demo

**Final submission accepted up to three days late (72 hours) will have scores reduced by 10% for each day of lateness. After three days late, student will not receive any credit.**

## Tips

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Start early.

Plan to work 4 to 6 additional hours outside the lab to complete this assignment

Ask clarifying questions to the instruction team if something is not clear

Plan to submit at least 1 hr. before the deadline to deal with potential Blackboard bugs

Have fun and keep it simple!

