HW8\src\Problem1.java

```java
  1  /*
  2  Name: Hunter Poole
  3  Date: 4/2/25
  4  HW #: 8
  5  Problem #: 1
  6  Source Code: Problem3.java
  7  Action: Finds and displays the monthly payment and loan term in months
  8          in a table. Needs the principal, yearly interest rate, years of
  9          repayment, and payments per year from user. Calls two functions
 10          to outsource math and display of table.
 11  */
 12
 13  import java.util.Scanner;
 14
 15  public class Problem1
 16  {
 17
 18      /*
 19      Action: Finds the monthly payment given a principal, yearly interest rate,
 20              years of repayment, and expected payments per year
 21      Parameters: float Principal, float AnnualInterestRate, int Years, int PaymentsPerYear
 22      Returns: float MonthlyPayment - the monthly payment amount
 23      Precondition: Requires a > 0 quantity for each input
 24      */
 25
 26      static float FindMonthlyPayment(float Principal, float AnnualInterestRate, int Years,
 27                                      int PaymentsPerYear, int Term)
 28      {
 29          float MonthlyPayment, MonthlyInterestRate, Dividend, Divisor;
 30
 31          AnnualInterestRate = AnnualInterestRate / 100;
 32          MonthlyInterestRate = AnnualInterestRate / 12;
 33
 34          Dividend = (MonthlyInterestRate * (float)Math.pow((MonthlyInterestRate + 1),
 35          Term));
 35          Divisor = (float)Math.pow((1 + MonthlyInterestRate), Term) - 1;
 36
 37          MonthlyPayment = Principal * (Dividend / Divisor);
 38
 39          return MonthlyPayment;
 40      }
 41
 42      /*
 43      Action: Shows a table of values for Principal, Interest Rate, No. of Years,
 44              Payments per year, No. of Payments, and Monthly Payment
 45      Parameters: float Principal, float AnnualInterestRate, int Years, int PaymentsPerYear,
 46      int Term,
```

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46                    float MonthlyPayment
47        Returns: None
48        Precondition: Needs float, float, int, int, int, float
49        */
50
51        static void Show_Table (float Principal, float AnnualInterestRate, int Years,
52                                int PaymentsPerYear, int Term, float MonthlyPayment)
53        {
54            System.out.printf("%n%-19s %s%.2f %n%-19s %.2f%s %n%-19s %d %n%-19s %d %n%-19s %d
   %n%-19s %s%.2f %n%n",
55                              "Principal", "$", Principal, "Interest Rate", AnnualInterestRate,
   "%",
56                              "No. of Years", Years, "Payments per year", PaymentsPerYear,
57                              "No. of Payments", Term, "Monthly Payment", "$", MonthlyPayment);
58        }
59
60        public static void main(String[] args)
61        {
62            float Principal, AnnualInterestRate, MonthlyPayment;
63            int Years, PaymentsPerYear, Term;
64            char Continue;
65
66            do
67            {
68
69            Scanner Input = new Scanner(System.in);
70            System.out.print("Principal: ");
71            Principal = Input.nextFloat();
72
73            System.out.print("Annual interest rate: ");
74            AnnualInterestRate = Input.nextFloat();
75
76            System.out.print("Years of repayment: ");
77            Years = Input.nextInt();
78
79            System.out.print("Payments per year: ");
80            PaymentsPerYear = Input.nextInt();
81
82            Term = Years * PaymentsPerYear;
83
84            MonthlyPayment = FindMonthlyPayment(Principal, AnnualInterestRate, Years,
85                                                PaymentsPerYear, Term);
86            Show_Table(Principal, AnnualInterestRate, Years, PaymentsPerYear, Term,
   MonthlyPayment);
87
88            System.out.print("Continue? Y or N: ");
89            Continue = Input.next().charAt(0);
90
91            } while (Continue == 'Y');
```

```
 92
 93        }
 94 }
 95
 96 /*
 97 Principal: 11000
 98 Annual interest rate: 10
 99 Years of repayment: 4
100 Payments per year: 12
101
102 Principal          $11000.00
103 Interest Rate      10.00%
104 No. of Years       4
105 Payments per year  12
106 No. of Payments    48
107 Monthly Payment    $278.99
108
109 Continue? Y or N: Y
110 Principal: 15500
111 Annual interest rate: 5.70
112 Years of repayment: 5
113 Payments per year: 12
114
115 Principal          $15500.00
116 Interest Rate      5.70%
117 No. of Years       5
118 Payments per year  12
119 No. of Payments    60
120 Monthly Payment    $297.50
121
122 Continue? Y or N: Y
123 Principal: 115000
124 Annual interest rate: 7.75
125 Years of repayment: 30
126 Payments per year: 12
127
128 Principal          $115000.00
129 Interest Rate      7.75%
130 No. of Years       30
131 Payments per year  12
132 No. of Payments    360
133 Monthly Payment    $823.88
134
135 Continue? Y or N: Y
136 Principal: 36418
137 Annual interest rate: 3.68
138 Years of repayment: 15
139 Payments per year: 12
140
```

```
141   Principal           $36418.00
142   Interest Rate       3.68%
143   No. of Years        15
144   Payments per year   12
145   No. of Payments     180
146   Monthly Payment     $263.58
147
148   Continue? Y or N: N
149    */
```