



MIT S4002

OBJECT-ORIENTED SOFTWARE DEVELOPMENT

Activity 07

Weightage: 5%

Due date: Friday Lesson 08 5PM

Late penalty applies on late submission, **10%** per day would be deducted
0 mark for LATE Submission more than one week

You will be marked based on your submitted zipped file on Moodle. You are most welcome to check your file with your lab tutor before your submission. **No excuse will be accepted** due to file corruption, absence from lecture or lab classes where details of lab requirements may be given.

Please make sure that you attend Lecture EVERY WEEK as low attendance may result in academic penalty or failure of this unit.

Student ID:

Student full name:

This assessment item relates to the unit learning outcomes as in the unit descriptors.

This checks your understanding about object-oriented software development.

This assessment covers the following LOs.

LO1 Demonstrate understanding of classes, constructors, objects, data types and instantiation; Convert data types using wrapper methods and objects

LO2 Independently analyse customer requirements and design object-oriented programs using scope, inheritance, and other design techniques; Create classes and objects that access variables and modifier keywords. Develop methods using parameters and return values

LO3 Demonstrate adaptability in building control and loop structures in an object-oriented environment; Demonstrate use of user defined data structures and array manipulation

Rubrics for MITS4002 Activity 07

| Criteria (used as a guide only) | Level of Performance | | | |
|--|----------------------|---|---|---|
| | 0 | 1 | 2 | 3 |
| Design/Analysis | | | | |
| Coding; Indentation; Comments | | | | |
| Output screenshots; Correct answer; Currency/Percentage formatting | | | | |
| 1 single WORD document as requested | | | | |
| Evidence of testing and debugging | | | | |

Total: 15/marks (scale to 5)

Project: Comparing Loans

Problem Description:

Write a program that lets the user enter the loan amount and loan period in number of years and displays the monthly and total payments for each interest rate starting from 5% to 8%, with an increment of 1/8. Here is a sample run:

<Output>

Loan Amount: 10000

Number of Years: 5

| Interest Rate | Monthly Payment | Total Payment |
|---------------|-----------------|---------------|
| 5.000% | \$188.71 | \$11,322.74 |
| 5.125% | \$189.28 | \$11,357.13 |
| 5.250% | \$189.85 | \$11,391.59 |
| ... | | |
| 7.875% | \$202.17 | \$12,129.97 |
| 8.000% | \$202.76 | \$12,165.83 |

<End output>

Use the formulas below to compute monthly payment and total payment.

$$monthlyPayment = \frac{loanAmount * monthlyInterestRate}{1 - \frac{1}{(1 + monthlyInterestRate)^{12 * numberOfYears}}}$$

$$totalPayment = monthlyPayment * 12 * numberOfYears$$

Design: (Describe the major steps for solving the problem.)

Coding: (Copy and Paste Source Code here. Format your code using Courier 10pts)

Output screenshot: (Paste your output screenshot here)

Testing: (Describe how you test this program)

Submit the following items:

1. This Word document and Submit to Moodle (you must submit the program regardless whether it complete or incomplete, correct or incorrect)

Hint:

1. Can you get the first four rows manually? This will help you understand how to compute the numbers mathematically.
2. Can you write a program to produce the first four rows? This will help you see the pattern.
3. Can you generalize it in a loop to produce all the rows?
4. Finally, format the output correctly.