Loan Case Study

To complete this Case Study, you will need to have this document AND the Loan Case Study Excel Document open. Please remember that you are not permitted to use AI for this assignment.

**Project Goal**: To see how the *interest rate* and *length of the loan* affect the *total interest you pay* over the life of a loan.

**Currency Used**: The official currency of Ghana is the Ghanaian Cedi, which is commonly referred to as "Cedi." The word "Cedi" derives from the Akan language, where it means "cowry shell." To denote this currency, the symbol "GHS" is placed before the numerical value, for example: GHS 1,333.05. While we use Cedi in this case study, the principles discussed here are applicable to any currency used in any country.

# **1. Understand the Problem**

Nia has started her own business making clothes. Her customers love her designs and in recent years her business has really grown. Now she wants to open a second location in a nearby city, but to do that she needs to take out a small business loan from the bank. Nia has calculated that she needs to take out a loan for GHS 1,800.

Banks typically apply a fee to process any type of loan. In addition, they also charge a monthly interest rate and monthly fees until the loan is fully repaid. The total amount of interest and fees charged is expressed as an Annual Percentage Rate (APR).

Nia has the choice of taking out a 2-year loan for a lower interest rate, or a 4-year loan for a higher interest rate. Nia needs to decide which loan would be best for her and her business.

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| Question | Answer |
| State the problem in your own words. | Nia needs a GHS 1,800 loan to open a second shop and must choose between a 2-year loan with a lower rate or a 4-year loan with a higher rate to find which costs less overall. |

**Add the loan information Nia collected to your spreadsheet. Complete on Spreadsheet:**

1. Go to the **2-Year Loan** spreadsheet.
2. Enter the information below into the **Loan Information** chart (yellow boxes). In order to learn about APR, it is recommended to review the vocabulary page at the beginning of the week.
   1. **Loan amount**: 1800
   2. **Loan fee**: 50
   3. **APR**: 23% (only type the number not the % symbol)
3. Go to the **4-Year Loan** spreadsheet.
4. Enter the information below into the **Loan Information** chart (yellow boxes).
   1. **Loan amount**: 1800
   2. **Loan fee**: 80
   3. **APR**: 31% (only type the number not the % symbol)

# **2. Identifying Variables and Assumptions**

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| Question | Answer |
| List three variables in this problem.  **Hint**: A variable is an element of a situation that has the potential to vary or change in value. | 1. Loan Amount (the amount borrowed – GHS 1,800)  2. Loan Fee  3. APR (Annual Percentage Rate) |
| List three assumptions for this problem.  **Hint**: Assumptions are ideas or concepts that are accepted as true. Assumptions are like removing the "what ifs" in a scenario. | 1. The APR stays fixed for the entire loan term  2. No extra payments are made early  3. All monthly payments are made on time |

# **3. Apply Quantitative Tools**

**Do the following in the spreadsheet**.

## 2-Year Loan Calculations (blue boxes)

1. **Total Loan Amount**: Loan Amount + Loan Fees = Total Loan Amount
2. **Loan Term (months)**: Put the loan term in months, not years, here.
3. **Monthly Payment**: This can be calculated using the PMT function in Excel.
   1. Start with = PMT(
   2. Use the information below to enter the arguments for this function.
   3. **Rate**: This is the monthly interest rate for the loan, expressed as a percentage. Find it by dividing the APR by 12.
   4. **Nper** (Number of Periods): This is the total number of payments for the loan. If the loan is to be repaid monthly over a period of 3 years, for example, the total number of payments would be 36 (12 payments per year x 3 years). In this project you would find this number in the Loan Term (months).
   5. **PV** (Present Value): This is the present value or principal of the loan, which is the amount of money borrowed. In this project you would find this number in the Total Loan Amount. ***Excel requires that you enter debts as negative numbers***. If you don’t your answer will be a negative number.
   6. [**FV**] (Future Value): This is the future value of the loan, which is the amount of money that will be owed at the end of the loan term. This argument is optional and is usually set to 0.
   7. [**Type**]: This is an optional argument that determines whether payments are due at the beginning or end of each month. If this argument is omitted or set to 0, payments are assumed to be due at the end of each month. If it's set to 1, payments are assumed to be due at the beginning of each month. In this project the payments are due at the end of the month.
4. **Total Payment**: Total Payment = Monthly Payments \* Loan Term
5. **Total Interest**: Total Interest = Total Payments – Total Loan Amount  
   This is the sum of all interest charges paid over the life of a loan.

## 2-Year Loan Amortization Schedule (pink boxes)

1. **Beginning Balance**: This column shows the amount of your loan remaining at the beginning of each month. In month 1, it is the Total Loan Amount. In months 2 and beyond, it is the Ending Balance from the previous month.
2. **To Interest**: To Interest = Beginning Balance \* (APR/12)  
   This is the amount of your Monthly Payment that goes to just paying off the interest on the loan. Be sure to remember to use an absolute refence to the APR using the $ signs so that you can copy this formula down the length of the table.
3. **To Principal**: To Principal = Monthly Payment – To Interest  
   This is the amount of your Monthly payment that goes to paying off the actual loan (called the principal). It is the amount of your Monthly Payment that remains after subtracting out the amount that was paid To Interest. Be sure to use an absolute refence to the Monthly Payment so you can copy this formula down the length of the table.
4. **Ending Balance**: This is the Beginning Balance minus whatever was paid To Principal.
5. **Autofill Amortization Schedule**: Extend the Amortization Schedule table to match the number of months of your Loan Term.
   1. If your Loan Term is 36 months, then this table needs to go to 36 months. If your Loan Term is 60 months, then this table need to go to 60 months.
   2. Fill in 2-3 months by hand then use Excel’s autofill feature for the rest. There is a video in Lesson 7 titled “Amortization Tables” which shows how to use the autofill features. If you are having trouble extending the table, talk to your teacher, a tutor, or a friend for help.

## 4-Year Loan Calculations (blue boxes)

1. (Use the same directions that you used to calculate the 2-Year Loan Calculations.)

## 4-Year Loan Amortization Schedule (pink boxes)

1. (Use the same directions that you used to calculate the 2-Year Loan Amortization Schedule.)

# **4. Make an Informed Decision**

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| Question | Answer |
| Look at the 2-year loan tab.   * How much would you be paying each month? * How much would you have paid in interest when you are done paying off the loan? | Monthly Payment: GHS 96.89  Total Interest Paid: GHS 475.37 |
| Look at the 4-year loan tab.   * How much would you be paying each month? * How much would you have paid in interest when you are done paying off the loan? | Monthly Payment: GHS 68.79  Total Interest Paid: GHS 1421.88 |
| Which loan do you think is the best option for Nia? Why? (Support your answer with numbers.) | 4-Year loan will be good with Nia. The monthly payment is a bit lower compared to the two-year loan, I think that can be managed without defaulting |
| Describe a lesson you have learned from this case study.  How would you teach this lesson to others? | Lesson Learned: It’s better to take a loan that you would pay for a long time with good monthly payment that is manageable and can’t be defaulted on.  Teach: I will teach others that loans are good if planned for and managed well over a period |

# **5. Evaluate Your Reasoning**

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| Question | Answer |
| What questions should Nia ask herself to evaluate her decision? (List at least three questions.) | 1. Will I be able to pay this loan?  2. Which is the best plan to go with in comparison to what I get from clients for expansion?  3. Will this loan guarantee my expansion? |

# Authenticity Check

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| Question | Answer |
| Did you complete this assignment on your own without using any unauthorized help, such as AI tools, someone else's work, or other resources not allowed in the instructions? If not, please redo the assignment on your own before submitting. | Yes |

# Turning in Your Assignment

1. Make sure all the answer boxes are filled in on this document.
2. Make sure all the colored boxes in the Excel spreadsheet are completed.
3. Review the rubric before you turn in this assignment to make sure you will get the best grade possible for your work.
4. Turn in both this document and the Excel spreadsheet.