



STUDENT WALKTHROUGH · SPRING 2026

# Four components. One financial picture.

Major Assignment 2 (MA2) is the financial-literacy capstone of MAT-144. Four worksheet components - Income & Projection, Student Loans, Credit Cards, Annual Budget - plus a six-section Word write-up. 100 points total, due at the end of Topic 4. Every number is personalized off your name. This walkthrough shows you the *shape* of every formula, never the literal answers.

**POINTS**

**100**

76% Excel · 24% write-up

**COMPONENTS**

**4**

tabs of calculations

**PERSONALIZED**

**Random tab**

hashes off your name

The Excel template and the Word write-up template both live next to this PDF on the course site. Open the .xlsx in desktop Excel for Microsoft 365. Work tab by tab in the order below - Components 1-3 feed into Component 4. Submit both the .xlsx and the .docx to Halo.

## WHAT'S IN THIS WALKTHROUGH

Page 2 - Component 1: Income & Projection (CPI, SLOPE, projection)	19 pts
Page 3 - Component 2: Student Loans (subsidized vs. unsubsidized PMT)	19 pts
Page 4 - Component 3: Credit Cards (month-by-month payoff table)	19 pts
Page 5 - Component 4: Annual Budget (8 categories + pie chart)	19 pts
Page 6 - The Word write-up (6 sections + 3 academic references)	24 pts
Page 7 - Submission checklist + grading rubric breakdown	-

### THE TEMPLATE'S COLOR LEGEND

**Blue** = enter text (name, labels). **Green** = enter a number (CPI, APR, dollar amount). **Gold** = enter an Excel formula with cell references. **Any other color** = leave alone. Get the colors right and you've eliminated most of the easy point losses.

# Major Assignment 2

Topic 4 - Income & Projection · Student Loans · Credit Cards · Annual Budget



## 01 - COMPONENT 1 · INCOME & PROJECTION · 19 PTS

This component is the Excel form of Topic 3 DQ 2 (inflation and CPI projection). Six rows of real CPI data from the Bureau of Labor Statistics, a best-fit line through them, then a five-year projection of CPI and of your career income. The starting month and year are randomized off your name - every student's CPI table looks different.

1

### Type your full name in C1, current year in C2.

Cell C1 needs at least 10 characters - the hash in the Random tab uses that length to generate your personalized starting month and year (in A29 and B29). Until C1 and C2 are filled, the CPI table labels are blank.

2

### Look up six CPI values at BLS.gov.

Go to [bls.gov/cpi](https://www.bls.gov/cpi) (Bureau of Labor Statistics, Consumer Price Index). For each of the six rows in your table, find the CPI value for the month and year shown in columns A and B. *Each row advances ONE YEAR*, not one month. Type each CPI value into the green cells C29:C34.

3

### Compute slope and intercept with Excel functions.

=**SLOPE**(C29:C34, B29:B34) and =**INTERCEPT**(C29:C34, B29:B34). Y first (CPI), X second (year). Format both result cells as Number with 3 decimals.

4

### Project CPI five years past the last row.

The projection year goes in C32 (green):  $B34 + 5$ . Then the projected CPI is =**slope\_cell** \* **proj\_year\_cell** + **intercept\_cell**. After that the inflation rate is =(**proj\_CPI** - **last\_CPI**) / **last\_CPI**. Format as a percentage.

5

### Project your income and compute monthly.

Five-year income: =**current\_income** \* (1 + **inflation\_rate**). Monthly version is just the 5-year income divided by 12. Format both as currency.

#### ■ COMMON SLIPS - INCOME & PROJECTION

**(1) CPI values typed for the wrong dates.** Each row is one year apart, not one month. **(2) Projection year is wrong.** It's 5 years past the LAST row of the CPI table, not 5 years past today. **(3) Slope and intercept arguments reversed.** Y first, X second - Y is CPI, X is year. **(4) Numbers typed into formulas.** The grader looks for cell references to your slope and intercept, not the literal decimal numbers.



# Major Assignment 2

Topic 4 - Income & Projection · Student Loans · Credit Cards · Annual Budget



## 02 - COMPONENT 2 - STUDENT LOANS - 19 PTS

Same PMT formula twice, applied to two scenarios: a **subsidized** loan (government covers in-school interest) and an **unsubsidized** loan (you accrue four years of simple interest, THEN amortize). The historical APR comes from the Mortgage Rates tab, looked up by a month/year that's personalized off your name (B12 and B13).

1

### Read your lookup keys in B12 and B13.

B12 is your assigned year, B13 is your assigned month. They're already computed from your name's hash. Don't change them.

2

### Find the APR on the Mortgage Rates tab.

Switch to the Mortgage Rates tab. Rows are years (1971-present), columns are months (Jan-Dec). Find the cell at *your year × your month*. Type that APR into B14 on the Student Loans tab. It's a green cell because you're typing a number.

3

### Compute the subsidized loan PMT.

The principal P is in A22. The rate is in B14.  $n = 12$  (payments/year),  $t = 10$  (years). Type the formula by hand:  $=P * (r/12) / (1 - (1 + r/12)^{-12*10})$ . Use cell references for P and r. Then total paid =  $PMT * 12 * 10$  and interest paid = total - P.

4

### Compute the unsubsidized loan extras.

Additional in-school interest (4 years of *simple* interest):  $=P * r * 4$ . New principal:  $=P + \text{additional\_interest}$ . Use the new principal in the PMT formula. For interest paid, subtract the ORIGINAL P from total (so you capture the in-school cost too).

#### ■ TYPE THE ALGEBRA - NOT =PMT()

Excel has a built-in  $=PMT(\text{rate}, \text{nper}, \text{pv})$  function that computes the monthly payment for you. It works perfectly - and the assignment explicitly forbids it. The grader is checking that you can write the algebraic formula directly:  $=P * (r/n) / (1 - (1 + r/n)^{-n*t})$ . Same rule for total paid: type  $=PMT\_cell * n * t$ , don't use  $=CUMIPMT()$ .

#### ■ COMMON SLIPS - STUDENT LOANS

**(1) Used =PMT() instead of the algebra.** No audit trail. Automatic point loss. **(2) Compounded the in-school interest.** It's *simple* interest:  $I = P * r * t$  with  $t = 4$ . Not compound. **(3) Used original P in the unsub PMT.** Unsub PMT uses the NEW principal ( $P + \text{in-school interest}$ ). **(4) Interest paid ignored the in-school cost.** For unsub, interest = total paid – original P (not new P), so the in-school interest is captured. **(5) APR typed as a decimal in B14 when it should be a percent** (or vice versa) - check the cell formatting, then use the cell reference consistently.

# Major Assignment 2

Topic 4 - Income & Projection · Student Loans · Credit Cards · Annual Budget



## 03 - COMPONENT 3 - CREDIT CARDS - 19 PTS

Build a month-by-month payoff table. Copy four formulas down rows 25 to wherever (often 100-250 rows) until the balance hits zero. The starting APR, balance, minimum-payment percent, and fixed-minimum are all in C13:C18 - personalized off your name. Cell A3 generates the problem statement with your specific numbers in it.

1

### Read your six personalized inputs in C13:C18.

APR, starting balance, payments per year (12), minimum payment, %-of-balance payment, and fixed-minimum payment. They're already filled in. The problem statement at A3 pulls these into a paragraph you can read aloud.

2

### Fill row 25 (the FIRST month) with the four formulas.

Column B (current balance) = C14 (starting balance). Column C (payment) =  $\text{=MAX}(\text{fixed\_min}, \%\_bal * \text{current\_bal})$ . Column D (balance after) =  $\text{=current\_balance} - \text{payment}$ . Column E (interest) =  $\text{=balance\_after} * \text{APR} / 12$ .

3

### Row 26 onward: roll the interest into next month's balance.

Column B for row 26 onward is  $\text{=previous\_row\_balance\_after} + \text{previous\_row\_interest}$ . Then C, D, E copy from row 25. Highlight C25:E25, grab the fill handle, drag down to row 200-ish. The balance in column B should be shrinking each row.

4

### Find the row where the balance falls below the minimum payment.

Eventually the current balance is smaller than the formula's calculated payment. That's the LAST row. On that row, *hand-edit* the payment to equal the current balance exactly:  $\text{=current\_balance}$ . The balance after now equals \$0.00 exactly. The grader checks for this.

5

### Fill the three summary cells (H25:H27).

Years to pay off =  $\text{=last\_period\_number} / 12$ , format to 2 decimals. Total paid =  $\text{=SUM}(\text{payment\_column})$ . Total interest =  $\text{=total\_paid} - \text{starting\_balance}$ . Currency on the dollar amounts.

#### ■ COMMON SLIPS - CREDIT CARDS

**(1) Final row not zeroed out.** Most submissions land at -\$3.47 or +\$1.20 because the formula was copied straight down. Hand-edit the final payment to clear the balance exactly. **(2) MAX() not used on the payment.** Without MAX(), once %-of-balance drops below the fixed minimum, your payment goes below the minimum and the schedule stretches forever. **(3) Interest computed on the wrong balance.** Interest is on the *balance after* the payment, not on the current balance. **(4) Years not to 2 decimals** - the rubric checks the format. **(5) Total interest computed by SUMming the interest column.** Use total paid – starting balance instead - it matches the rubric's definition.

# Major Assignment 2

Topic 4 - Income & Projection · Student Loans · Credit Cards · Annual Budget



## 04 - COMPONENT 4 · ANNUAL BUDGET · 19 PTS

Eight personal-spending categories you fill out yourself, plus **two rows that come from the other tabs by cell reference** (your subsidized loan PMT and your first credit-card payment). Then a pie chart, a 5-year projection of the total budget using the inflation rate from Component 1, and remaining income.

1

### Fill Frequency-per-year and Cost for the eight categories.

Rows 18-25 are: Housing, Utilities, Food, Transportation, Insurance, Medical, Personal, Other. For each, type a *realistic* frequency (number of times per year you pay) into column B and a Cost into column C. Both green cells. Total Annual Cost = `=B18*C18` in column D.

2

### Reference the subsidized loan PMT in row 26.

Click into B26 (or wherever the subsidized loan row lives) and type `=`, then click the PMT cell on the Student Loans tab. Excel writes the cross-sheet reference for you: `= 'Student Loans' !B29`. Do not retype the dollar amount.

3

### Reference the first credit card payment in row 27.

Same move: `= 'Credit Cards' !C25`. C25 is the first month's payment on the Credit Cards tab.

4

### Sum the budget and insert a pie chart.

Total budget in D28 = `=SUM(D18:D27)`. Then highlight the category names column + the Total Annual Cost column. Insert → Chart → Pie. *Change the chart title* from "Chart Title" to something real (your name's annual budget, etc.). Right-click a slice → Add Data Labels → Format Data Labels → check Percentage.

5

### Project the budget five years out and compute remaining income.

5-year budget: `=total_budget * (1 + inflation_rate)`. Reference the inflation rate from your Income & Projection tab. Remaining income: `=5yr_income - 5yr_budget`. Both currency-formatted.

#### ■ COMMON SLIPS - ANNUAL BUDGET

**(1) Retyped the loan and CC payments.** They must be cell references (with the `=` sign and the tab-name in single quotes), not literal dollar amounts. The grader opens each cell. **(2) Pie chart left as "Chart Title".** Change it. **(3) No percentage labels on the pie.** Right-click → Add Data Labels → Format → check Percentage. **(4) Inflation rate retyped.** Reference the rate from the Income & Projection tab (cross-sheet), don't paste the number. **(5) Frequency & cost not realistic.** The rubric isn't auditing your real life, but obviously-fake numbers (Housing 12x/yr at \$10) cost points.



# Major Assignment 2

Topic 4 - Income &amp; Projection · Student Loans · Credit Cards · Annual Budget



## 05 - THE WORD WRITE-UP · 24 PTS

The write-up turns the Excel numbers into prose. Six section headings, each with 2-3 questions to answer in paragraph form. Minimum three scholarly references. The Word template is downloadable next to the Excel template; the headings are pre-formatted so you just fill in the prose.

### The six sections + reference page:

1. Income & Projection · 2 questions	no refs
2. Student Loans · 3 questions	refs (Q3)
3. Credit Cards · 3 questions	refs (Q1)
4. Annual Budget · 3 questions	no refs
5. Ethics & Christian Worldview Analysis · 3 questions	refs (Q1)
6. Summary & Reflections · 2 questions	no refs
7. References · minimum 3 scholarly sources	APA or MLA

**Three questions explicitly require academic references:** Student Loans Q3 (impact of loan debt), Credit Cards Q1 (building credit without debt), and Ethics Q1 (charitable giving + the global economy). Other questions can cite if helpful but don't have to. The template gives APA/MLA format examples for books, journals, websites, and AI model outputs.

**Paragraph rules.** Prose, not bullet lists, in the body. One paragraph per numbered question. College-level writing, proofread for grammar and spelling. Don't quote the question stems back at the grader - answer them. If you reference a number from your Excel workbook, name the number ("my projected CPI of 312.4..." rather than "the CPI value").

#### ■ THE COVER BLOCK

The very first lines of the Word document (NO heading above them): your degree program + intended career on one line, then your name, then "MAT-144", then the instructor's name, then today's date. Five short lines. Don't add a heading like "Title Page" - the convention is no heading at the top.

#### ■ COMMON SLIPS - WRITE-UP

**(1) Fewer than 3 academic references.** Three is the floor, not the target. **(2) References not formatted in APA/MLA.** A bare URL doesn't count. **(3) Bulleted lists used in body paragraphs.** Prose only. **(4) Question stems pasted into the document.** Just answer the question; the grader has the stem. **(5) AI model citation missing.** If you used ChatGPT/Claude/etc., cite it as a source using the AI template format the write-up provides.

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Topic 4 - Income & Projection · Student Loans · Credit Cards · Annual Budget



## 06 - BEFORE YOU SUBMIT

Most point losses on MA2 aren't math errors - they're formatting slips, retyped numbers where cell references were expected, or =PMT shortcuts. Catch them here.

- Income: Name in C1, CPI from BLS, proj year = B34 + 5 ✓
- Income: SLOPE/INTERCEPT to 3 decimals, income as currency ✓
- Loans: APR in B14, PMT typed by hand (not =PMT) ✓
- Loans: Unsub uses NEW principal; CC last row balance = \$0.00 ✓
- Budget: Loan + CC rows are cell refs; pie chart titled + % ✓
- Write-up: 6 sections + 3 refs; both files uploaded to Halo ✓

**If all six check, you're at 100%.**

## 07 - GRADING RUBRIC BREAKDOWN

The 100 points are split 76 / 24 between the Excel and the Word write-up. Each Excel component is worth 19 pts. Formatting (currency, decimals, percent) and audit-trail (formulas, cell references) checks live inside those 19, not as a separate score.

Component 1 - Income & Projection	19 pts
Component 2 - Student Loans	19 pts
Component 3 - Credit Cards	19 pts
Component 4 - Annual Budget	19 pts
Word write-up (6 sections + refs)	24 pts

### STUCK? OPEN THE LIVE PAGE ON MAT144.COM

Every component on this PDF has a corresponding page at [MAT144.com/topics/4/ma](https://mat144.com/topics/4/ma) with the same hints plus deep links into the relevant lessons and the interactive Financial Formulas Calculator. The PMT formula in the calculator matches what the Student Loans tab wants you to type by hand.