

Assignment 3 - gg

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Executive Summary

This report evaluates whether a U.S. student, fully supported by their parents, can afford to study the Master of Computer Science program at Monash University. With an annual budget of USD 43,593.90, we analyze tuition, rent, living expenses, visa, and insurance fees. Our estimate shows a total annual cost of approximately USD 57,831.60—exceeding the budget by over USD 14,000. Without extra support such as scholarships or shared housing, Monash is not financially feasible under current assumptions.

Introduction

Studying abroad can be a life-changing opportunity, but it also involves major financial planning. This report examines whether a U.S. student with full financial support from their parents can afford to study the Master of Computer Science at Monash University. The annual budget is set at USD 43,593.90, with no scholarships, savings, or part-time jobs assumed. We use a global dataset of Computer Science programs and isolate records related to Monash. Tuition is calculated from annualized program fees. Living costs are based on the Numbeo index, and monthly rent is multiplied over a year. Additional expenses such as visa and insurance are included. Total cost is compared against the student's budget to evaluate affordability. The goal is to provide financial insights for future international students.

Methodology

Data Import and Validation

This analysis based on The Cost of International Education dataset which was imported via `read_csv(here("data/International_Education_Costs.csv"))`.

Warning: package 'tidyverse' was built under R version 4.4.3

Warning: package 'ggplot2' was built under R version 4.4.3

Warning: package 'tibble' was built under R version 4.4.3

Warning: package 'tidyr' was built under R version 4.4.3

Warning: package 'readr' was built under R version 4.4.3

Warning: package 'purrr' was built under R version 4.4.3

Warning: package 'dplyr' was built under R version 4.4.3

Warning: package 'stringr' was built under R version 4.4.3

Warning: package 'forcats' was built under R version 4.4.3

Warning: package 'lubridate' was built under R version 4.4.3

-- Attaching core tidyverse packages ----- tidyverse 2.0.0 --

v dplyr 1.1.4 v readr 2.1.5

v forcats 1.0.0 v stringr 1.5.1

v ggplot2 3.5.2 v tibble 3.2.1

v lubridate 1.9.4 v tidyr 1.3.1

v purrr 1.0.4

-- Conflicts ----- tidyverse_conflicts() --

x dplyr::filter() masks stats::filter()

x dplyr::lag() masks stats::lag()

i Use the conflicted package (<<http://conflicted.r-lib.org/>>) to force all conflicts to become

Warning: package 'here' was built under R version 4.4.3

here() starts at D:/MONASH/ETC5513/assignment-3-reproducible-reporting-gg

Rows: 907 Columns: 12-- Column specification -----

Delimiter: ","

chr (5): Country, City, University, Program, Level

dbl (7): Duration_Years, Tuition_USD, Living_Cost_Index, Rent_USD, Visa_Fee_...

i Use `spec()` to retrieve the full column specification for this data.

i Specify the column types or set `show_col_types = FALSE` to quiet this message.

This dataset provides USD-standardized values for tuition, rent, living-cost index, visa fees, and insurance across universities, in 2025 globally. We filtered for the Master of Computer Science program at every university, verified that key cost fields were numeric, and removed any rows with missing values in those columns.

Cost Component Calculation

Each institution's Total yearly Cost was calculated by summing four components:

1. Annual Tuition = Tuition_USD \div Duration_Years **2. Annual Rent** = Rent_USD \times 12 **3. Other Living Cost** = \$15,000 \times (Living_Cost_Index \div 100) **4. One-off Fees** = (Visa_Fee_USD + Insurance_USD) \div Duration_Years

Income Projection, Budget and Affordability Ratio

We sourced the 2023 U.S. median household income of \$80,160) and projected it to 2025 using a 2.8% compound growth rate: Average Household Income in 2025 = \$80,160 * (1 + 0.028)²

Assuming that each student will have half of median household income as their budget to make a comparison: Budget = Average Household Income in 2025 * 0.5

Affordability ratio was defined by: affordability ratio = student budget/cost per year ratio > 1 will indicate that student budget can cover the annual cost.

Analytical Environment

All calculation and visualization were executed in R using tidyverse package (which includes readr, dplyr, tidyr, ggplot2, tibble, purrr, et c.) and Quarto for reporting.

- Figure 1 represent each university's affordability ratio
- Table 1 represent lists the top five most and least affordable programs.

Table 1: Table 1: Top 5 Most and Least Affordable MCS Programs for U.S. Students in 2025

Category	University	AffordabilityRatio
Most Affordable	Port Said University	5.3375538
Most Affordable	University of Tunis	4.5409040
Most Affordable	IIT Pune	4.1133442
Most Affordable	Bangladesh University of Engineering	3.8987349
Most Affordable	University of Subotica	3.7962281
Least Affordable	University College London	0.5700820
Least Affordable	King's College London	0.5726496
Least Affordable	Harvard University	0.6237633
Least Affordable	MIT	0.6247698
Least Affordable	UCLA	0.6450656

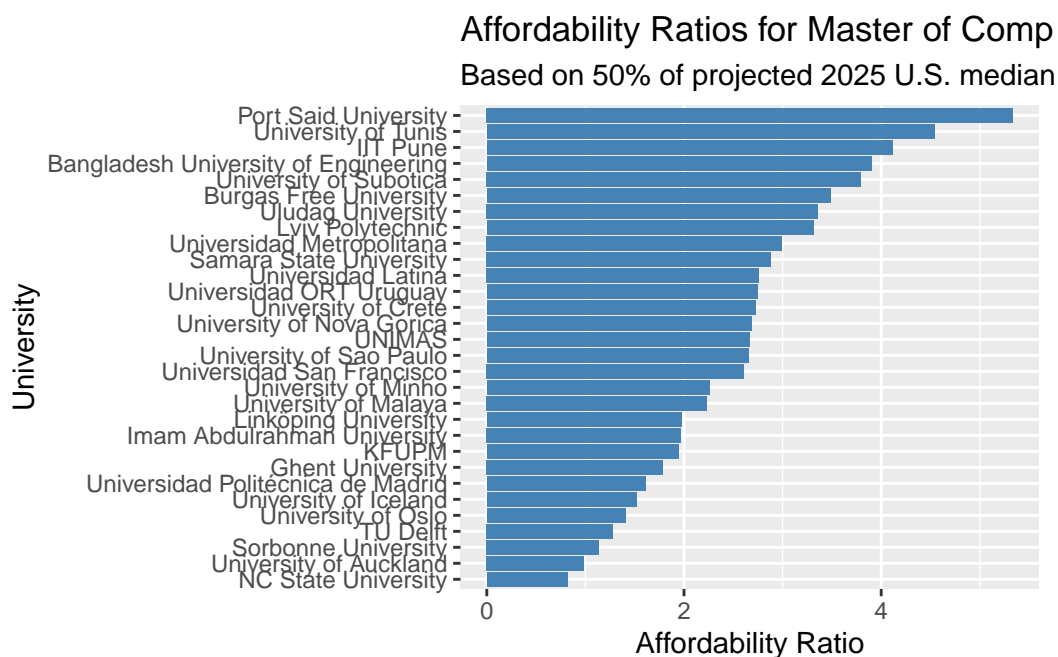


Figure 1

Result

The following figure compares the estimated affordability ratio of applying a Master of Computer Science across selected universities

Figure 2 shows the bottom 30 universities with the lowest affordability ratio for applying a master degree of Computer Science in 2025. Monash University ranks in the **bottom range**, with a ratio is **0.771** for one academic year. Although its tuition fee is moderate, relatively high rent and living expenses in Melbourne contribute to the overall cost. These results highlight the role of rent and living expenses form the full financial burden of international education.

Conclusion

This report evaluated the total cost of a USA student with a budget of **USD 43,593.90** studying a Master of Computer Science at Monash University. By analyzing tuition fees, rent, living expenses, visa, and insurance costs across global universities which have master of computer science.

Our analysis shows that Monash University's tuition fee of a year is **USD 21,400** which is relatively moderate compared to U.S. and U.K. universities. The cost of living index in Melbourne (72.8) and Numbeo's estimated monthly expenses (USD 1,244.3) support the city's

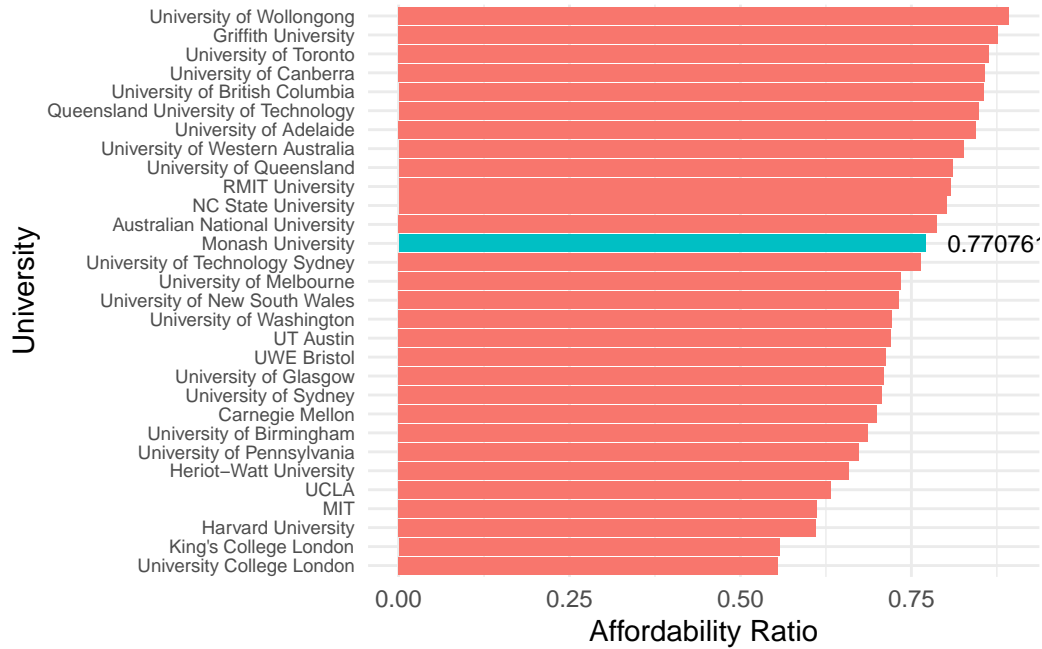


Figure 2: Bottom 30 Estimated Affordability Ratio of Master of Computer Science

living cost as a reasonably affordable location for international students. The living cost of a year will be estimated as **14,931.6**. However, monthly rent of USD 1,700 significantly increases the total cost over the an year duration, reaching an estimated **USD 20,400** for single living per year. Combined with **visa (USD 450)** and **insurance fees (USD 650)**, the total cost is **USD 57831.6**, which is **well above** the budget.

Therefore, under current assumptions, pursuing this degree at Monash would **likely impose a financial burden** unless supplementary funding options such as scholarships, shared housing, or part-time employment are secured.

We recommend that international students conduct a detailed cost breakdown when planning to study abroad, considering not only tuition fee but also living and setup costs. University like Monash remain attractive due to their academic reputation and moderate tuition fee, but total affordability depends on each student's financial context.