Assignment 3 - gg

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1 Executive Summary

This report investigates whether a U.S. student applying to the Master of Computer Science program at Monash University can afford the associated costs. The student's parents are willing to provide full financial support, with an annual budget of USD 43,593.9. By calculating and comparing tuition, rent, visa, and insurance expenses over two years, we estimate the total cost at approximately USD 84,700. The results indicate that while the budget is sufficient, the choice may still impose noticeable financial pressure on the family.

2 Introduction

Pursuing a graduate degree abroad is a major life decision that often comes with substantial financial considerations. This report focuses on a student from the United States who plans to apply for the Master of Computer Science program at Monash University. The student's tuition and living costs will be fully supported by their parents. The family has set a fixed annual budget of USD 43,593.9 for the two-year program. No scholarships, personal savings, or part-time work are assumed in this analysis. The key question is whether this budget allows

the student to afford Monash without putting excessive financial pressure on the family. We analyze multiple cost components including tuition, accommodation, visa fees, and insurance. Data is sourced from a standardized international education cost dataset in USD. Monash University, located in Melbourne, is known for its strong computer science program but also relatively high costs. This report aims to assess affordability under the current assumptions and explore whether the choice is financially sustainable for the student's family.

3 Methodology

Data Source and Preparation

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

The *Cost of International Education* dataset consists of tuition fees, rent, living-cost index, visa fees, insurance, and exchange rates, all standardized to U.S. dollars at the time of data collection (primarily 2023) across global universities. We filtered the dataset for the Master of Computer Science records and verified that all cost variables (`Tuition_USD`, `Duration_Years`, `Living_Cost_Index`, `Rent_USD`) were numeric, with no missing values in these fields. Duplicate university names were detected and resolved by aggregating to a single mean affordability ratio per institution.

Cost Projection and Component Calculation

To estimate affordability for 2025, all recurring cost components (tuition, rent, living expenses) were projected forward using a compound annual inflation rate of 4.75%[1]. The projected cost for each component was computed as:

1. **Annual Tuition** = Tuition_USD ÷ Duration_Years
2. **Annual Rent** = Rent_USD × 12
3. **Other Living Cost** = \$17,736[2] × (Living_Cost_Index ÷ 100)

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[1] This rate reflects the IMF's forecasts for advanced economies—2.6% for 2024 and 2.1% for 2025—since both Australia (Monash) and the United States are classified as advanced economies.

$$\text{ProjectCost}_{2025} = TotalCost_{2023} \times 1.0475$$

Total Cost 2023 derived from summation of below costs:

[2] Derived from NYU's *Cost of Attendance (2024–25)* "Traditional Programs" table. We took the 9-month total living cost (\$41,236 USD), subtracted Housing (\$23,588 USD) and Health Insurance (\$4,346 USD), divided by 9, then annualized to 12 months:

$$\frac{\$41,236 - \$23,588 - \$4,346}{9} \times 12 \approx \$17,736$$

One-off Fees: Visa and insurance costs were excluded from the primary analysis, as they accounted for less than 5% of total cost in 2023 and are policy-driven, unpredictable, and minor relative to recurring expenses.

Income Projection, Budget and Affordability Ratio

We obtained the 2023 U.S. median household income ($80,160) from the U.S. Census Bureau (U.S. Census Bureau 2024) and projected it to 2025 using a compound annual growth rate of 2.8%[3]:

$$\text{HouseholdIncome}_{2025} = \$80{,}160 \times (1 + 0.028)^2$$

Assuming that each student can allocate 50 % of this projected income as their annual education budget:

$$\text{StudentBudget}_{2025} = HouseholdIncome_{2025} \times 0.5$$

The affordability ratio is defined as:

$$\text{AffordabilityRatio} = \frac{\text{StudentBudget}_{2025}}{\text{TotalYearlyCost}_{2025}}$$

A ratio greater than 1 indicates that a U.S. student from median-income household could afford the first year at Monash or a comparable university in 2025.

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[3]Compound annual growth rate calculated from FRED series **MEHOINUSA646N** (Median Household Income in the United States), rising from $62,637 in 2013 to $80,610 in 2023:

$$\left(\frac{80\,610}{62\,637}\right)^{1/10} - 1 \approx 0.028 \quad (2.8\%)$$

Analytical Environment

All analyses and visualizations were executed in R using **tidyverse** package within a Quarto-driven, reproducible workflow. Data import was handled by **readr**, and plotting by **ggplot2**, and tables were generated with **knitr**. All code is version-controlled via Git. The final report was authored in Quarto and rendered to PDF using LaTeX.

- Figure 1 shows each university's affordability ratio.
- Table 1 summarizes the five most and least affordable Master of Computer Science programs.

Table 1: Top 5 Most and Least Affordable Master of Computer Science Programs (2025 Budget)

Category	University	AffordabilityRatio	Rank
Most Affordable	Port Said University	4.6231617	1
Most Affordable	University of Tunis	3.9251190	2
Most Affordable	IIT Pune	3.5472337	3
Most Affordable	Bangladesh University of Engineering	3.3639060	4
Most Affordable	University of Subotica	3.2815913	5
Least Affordable	UCLA	0.5961038	107
Least Affordable	MIT	0.5774141	108
Least Affordable	Harvard University	0.5762006	109
Least Affordable	King's College London	0.5319481	110
Least Affordable	University College London	0.5294572	111

4 Result

The following figure compares the total estimated cost of pursuing a Master of Computer Science across selected universities

Figure 2 shows the top 30 universities with the highest estimated total cost for completing a Master of Computer Science. Monash University ranks in the **upper-middle range**, with a total cost is **USD 57,831.6** 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.
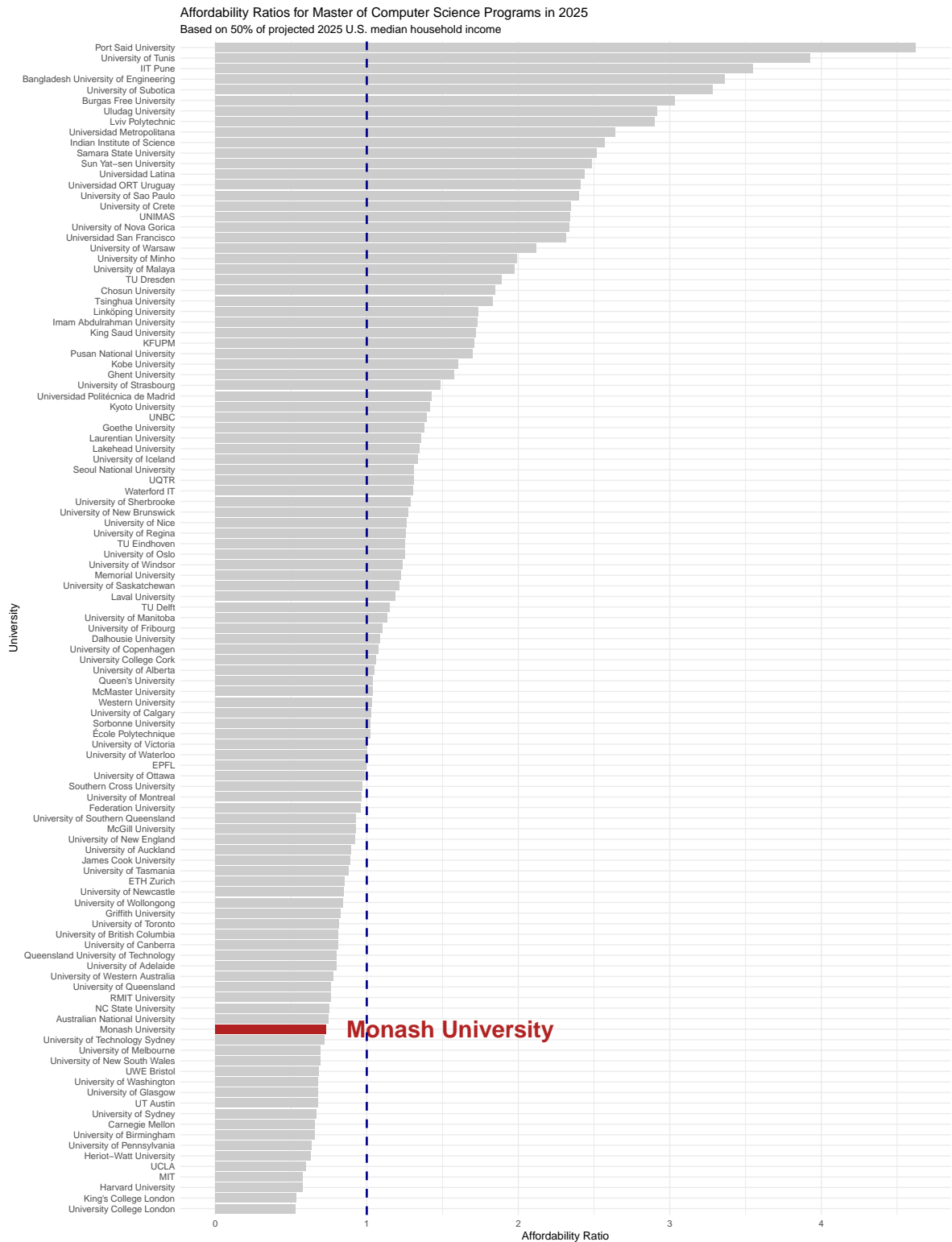
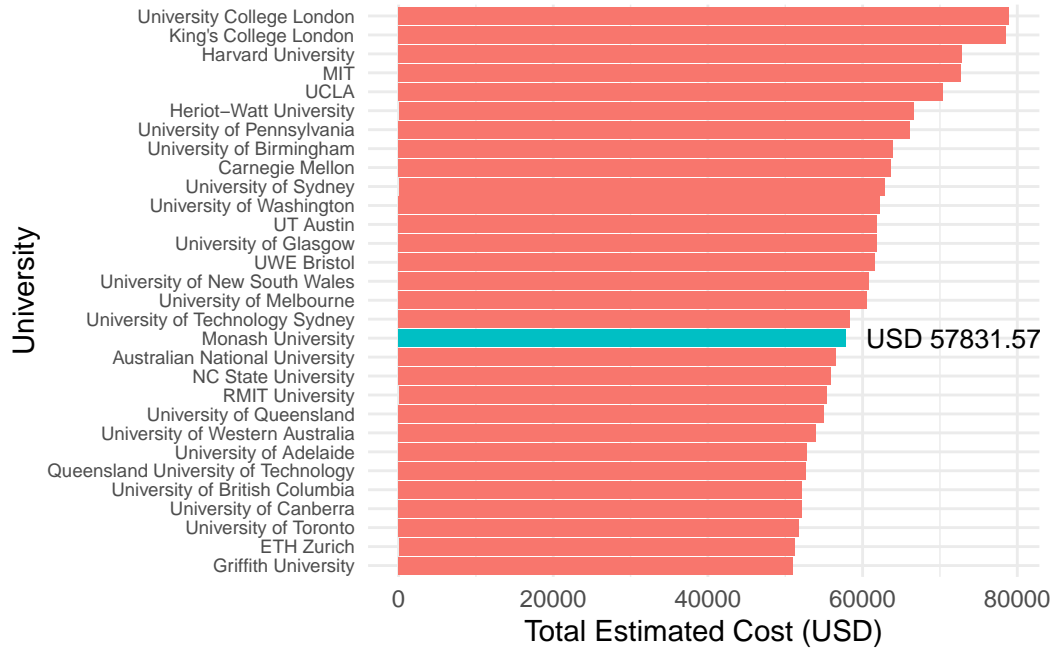Figure 1: Affordability Ratios for Master of Computer Science Programs by University in 2025

Figure 2: Top 30 Estimated Total Cost of Master of Computer Science

5 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 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.