

An Investigation on University Applications
using Mathematical Modelling

Diocesan Girls' School

Team members 隊員	Name in English		中文姓名	Class 班別
	1	Chan Pui Kei	陳霈琦	1U
	2	Ho Pui Fei	何沛霏	1U
	3	Wong Kaylie	黃愷晴	1U
	4	Xu Jiayan	徐嘉妍	1U
	5	Zheng Ziling Linnie	鄭紫齡	1U

1 - Introduction

University is a very important stage of life, and it is crucial to apply strategically to increase the chance of admission. In this project, we shall develop a mathematical model that can rate the competitiveness of a university application.

We predicted the chance of admission to each of the 20 programs in the university application by considering the following 3 factors:

1. The banding;
2. The admission score;
3. The number of offers and the number of applicants.

We then designed a formula to combine the above 3 factors and give a percentage that reflects the chance of admission to the 20 programs.

Afterwards, we evaluated the overall competitiveness of the university application by taking into account the advice given to applicants as to what makes a good application. We shall then give suggestions for improving the application.

Finally, we made a comparison on whether it is easier to enter a university course via JUPAS (with HKDSE results) or non-JUPAS (with GCE A Level results). We considered two factors: the admission scores and the class size and combined them using a weighted mean.

2 - The JUPAS Application System and the Assumptions

The JUPAS Application System

The Joint University Programs Admissions System (JUPAS) is a unified system for applying to full time undergraduate programs in Hong Kong. A JUPAS university application contains 20 program applications divided in 5 bands (A1-A3, B4-B6, C7-C10, D11-D15 and E16-E20). Putting choices in different bands will affect the scoring of the applicants in the JUPAS process. While a higher banding will increase the chance of getting into a program, the actual choice order, other than bandings, are not available to the admission related person.

A1	4501- CuHk Medicine Programme
A2	6456- HKU Bachelor of medicine
A3	1801- CityU Veterinary Medicine
B4	JS6482- hku Bachelor of Chinese Medicine
B5	JS6767- hku Bachelor of Economics / Bachelor of Economics and Finance
B6	JS6054- hku Bachelor of Arts
C7	JS6078- hku Bachelor of Arts and Bachelor of Laws (double degree)
C8	JS6236- hku Bachelor of Arts and Sciences in Design+
C9	4550- cuhk biomedical Science
C10	JS6494- hku Bachelor of Pharmacy
D11	6157- hku bachelor of science in speech-language pathology
D12	6119- hku bachelor of education and bachelor of science (double degree)
D13	6949- hku biomedical sciences
D14	6705- hku bachelor of psychology
D15	6717- hku bachelor of social sciences
E16	6470- hku Science in Bioinformatics
E17	4862- cuhk psychology
E18	JS6107 - Bachelor of Dental Surgery
E19	4525- cuhk pharmacy
E20	4725- cuhk biotechnology, entrepreneurship and healthcare management

A JUPAS application consisting of 20 program choices. We shall use this example to illustrate our mathematical model in the later part of our work.

The Assumptions

In our work, we have assumed that the chance of admission is affected by 3 factors only. These are the factors with real data from previous years for further analysis. We have taken all data from the year 2022, as we believe they are the most updated and accurate data for our use.

In the actual running of the mathematical model, the applicant needs to have a predicted public examination result, as the JUPAS application is done before the public examination results are released. In our work, we have used the maximum possible score (51 marks) to test our model.

Short Form of the Terms used

MinAS	Minimum Admission Scores
LQ	Lower Quartile
Med	Median
UQ	Upper Quartile
MaxAS	Maximum Admission Scores
M	Marks

Analysis and Suggestions for Improvement

For the above example in which we assumed the applicant attains a maximum HKDSE score, the analysis of the JUPAS application gives a 7.93/9 mark, which is a fairly high mark. However, we see that the subject choices can still be improved.

For the choices in bands C to E, we can see that a lot of marks are 0.5. It is because the ratio of the number of offers to the number of applicants is quite low for these program,. It is recommended to choose programs with a higher admission rate, so that these programs can be moved up to band A or B if the actual HKDSE result is lower than expected.

7 - Reference and Links

This is the link to the three spreadsheets:

https://docs.google.com/spreadsheets/d/13IB5nwpEYl5tztN01bZJz_27v-Wejc5NJB2R0KVnXTY/edit#gid=0

[1] JUPAS Official Website:

<https://www.jupas.edu.hk/>

[2] JUPAS 選科策略、排位原則 Website

https://www.tutorboard.com.hk/blog/blog_article/sspa/JUPAS-programme-selection

[3] Information about JUPAS on Wikipedia

<https://en.wikipedia.org/wiki/JUPAS>

[4] Non-JUPAS Admission Figures from the Hong Kong Polytechnic University

<https://www51.polyu.edu.hk/eprospectus/ug/non-jupas/admission-figures-for-gce-ib-qualifications>

We designed a formula to give a percentage that reflects the chance of admission to the 20 university programs. Afterwards, we evaluated the overall competitiveness of the university application by taking into account the advice given to applicants as to what makes a good application. We shall then give suggestions for improving the application. Finally, we made a comparison on whether it is easier to enter a university course via JUPAS (with HKDSE results) or non-JUPAS (with GCE A Level results).