An introduction to the ATAR calculation

Can we predict what UAC does?

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Maths Teachers' Day 2013

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What is an ATAR?

The Australian Tertiary Admissions Rank (ATAR) is

- a number between 0 and 99.95 giving a ranking
- produced by the Universities Admission Centre (UAC) from raw (unbanded) marks provided by Board of Studies
- designed to be as good a predictor of university performance as any single indicator possibly can be.

The sole purpose of the ATAR is for entry to University programs.

The ATAR tells us nothing about what students know but everything about their ranking in their year group.

(The HSC tells us a lot about what students know but nothing about their rank in their year.)

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What does an ATAR mean?

- An ATAR of 60 doesn't mean the student got 60%.
- An ATAR of 60 doesn't mean the student's overall marks scaled to 60%.
- An ATAR of 60 means a student is in the 60th percentile, ie in the top 40%, of their year 7 cohort.

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How is the ATAR calculated?

- The Board of Studies gives UAC the raw HSC marks.
- HSC marks are scaled to reflect scores obtained if everyone sat the course (but still scored out of 100).
- A student's best 2 units of English + best 8 other units selected.
- The results are added to produce a mark out of 500.
- All students are ranked according to their score out of 500.
- A student's ATAR is their percentile position out of all students who started year 7 with them.

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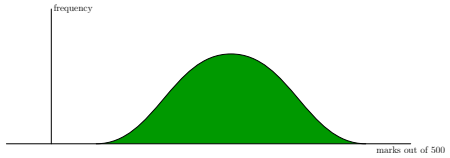
The ATAR spread

The distribution of scores out of 500 is effectively normal.



An extra 20 scaled marks may send $99 \to 99.5$ but $60 \to 65$

Last year over 50 000 students qualified for an ATAR.

Each bonus point jumps more than 500 places in the queue.

If a student gets 5 bonus points they're jumping over 2500 people.

Check out the Points to UOW scheme.

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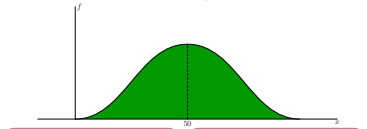
Calculating the ATAR: Step 1

First we standardise all course results.

- Board of Studies provides UAC with raw marks.
- Results in 2-unit courses are scaled to a common profile;
  - same average (mean),
  - same standard deviation (sd) and
  - same top mark.



What do the words mean? What does the scaling do?

- This changes the marks but not the ranking within a course.

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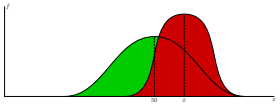
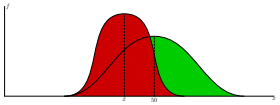
Calculating the ATAR: Step 2

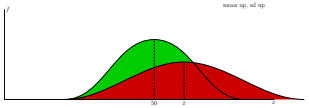
Now we benchmark the 2-unit courses: we adjust mean and sd to match cohort performance across all their other subjects.

If all students in a course are performing strongly in their other courses

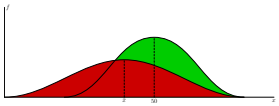


If all students in a course are performing weakly in their other courses





If performance is mixed but good overall



If performance is mixed and weak overall

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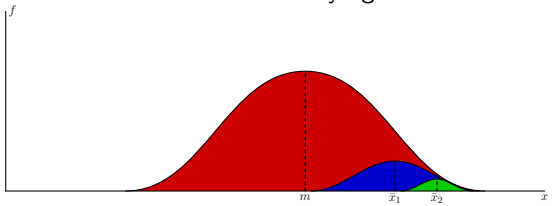
Calculating the ATAR: Step 3

Extension courses are scaled by comparing the cohort to to that of the underlying course.

Maths: Extension 1 is scaled directly against 2-unit Mathematics, and Extension 2 is scaled directly against Extension 1. The net effect is



red = 2-unit
blue = Extn 1
green = Extn 2

English: Both Extension 1 and Extension 2 are scaled directly against 2-unit English (Advanced).

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Predictions and Observations

- You can't predict someone's ATAR unless you know everybody's raw mark on all the courses for that cohort.
- UAC scales people, not courses.
  - No subject will guarantee a student a high ATAR.
  - No subject will condemn a student to a low ATAR.
- The worse the overall performance of the cohort taking a course, the nearer the top a student has to be in order to benefit from scaling.
- Students should do subjects they enjoy, because they are likely to perform better in them.

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What are ATAR cut-offs?

- Each university sets a minimum ATAR for and a quota of students for each university course.
- The ATAR cut-off for a course each year is the ATAR of the person with the lowest ATAR who was admitted to the course that year (not including forced offers).
- ATAR cut-offs reflect supply and demand more than the intellectual capacity needed to undertake the studies.

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Any Questions?

Thank you for your attention.

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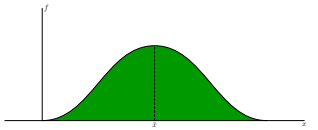
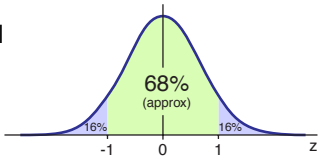
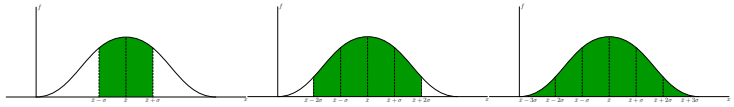
Features of a normal distribution

The mean, or average, of a normal distribution is a measure of centre; its value is usually denoted by $\bar{x}$.



The standard deviation, σ, of a normal distribution is a measure of spread; $\approx 68\%$ of data is within one standard deviation of the mean.





Scaling subjects

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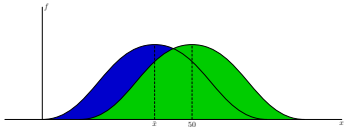
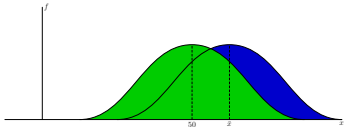
What does this scaling do?

The mean can move up to 50



or down to 50.



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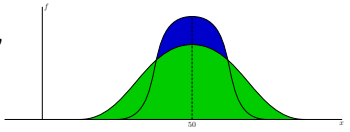
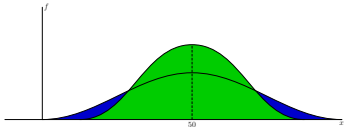
What does this scaling do?

The standard deviation can increase, flattening and stretching the distribution out,



or it can decrease, compressing the distribution.



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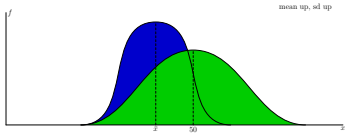
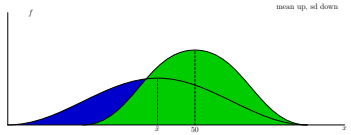
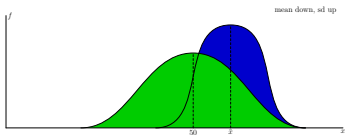
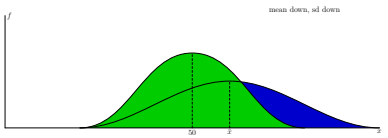
The combined effects...









Scaling subjects

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