TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

Transition into “Digital” Engineering Study

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Motivator

- VUW (in collaboration with WelTec) investigated barriers to successful tertiary “digital” engineering study

- Academic and non-academic influencers

Survey Results (partial)

1. Poor understanding of “digital” (modern) engineering
   - Teachers
   - Careers advisors
   - Parents

   Until recently, no engineering related courses

2. Poor understanding of expectations of university study

Adacemic Results

- Failure of NCEA
  - Different work ethic
    - Pick & choose
    - Resits
  - Secondary schools protecting league tables
    - Marginal students prevented from advancing in mathematics and sciences
- MATHS
  - International problem
  - Poor fit from NCEA Achievement maths to university level mathematics

Numerical Prediction

- NCEA results subject to correlation and data mining analyses
  - Attainment of “achieved” not sufficient
    - Many examples of 20+ achievement standards in mathematics failing badly at university
  - Strongest correlation (0.722) and data mining results for sum of merits & excellences in mathematics & physics (in hardware engineering)
  - No strong correlation for software/networking BUT
  - Computer studies provided **negative** correlation to tertiary success

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Other Findings

- Students reluctant to seek assistance
  - Realise they are being lazy, believe they can catch up later
- Lecturer conflicts

- Pastoral agent
  - Uses NCEA grades, diagnostic and “big sister” to identify marginal students
  - Interview to find root problem
  - Proceeds to “**stalk**” them
  - Direct to appropriate assistance (or degree withdrawal)

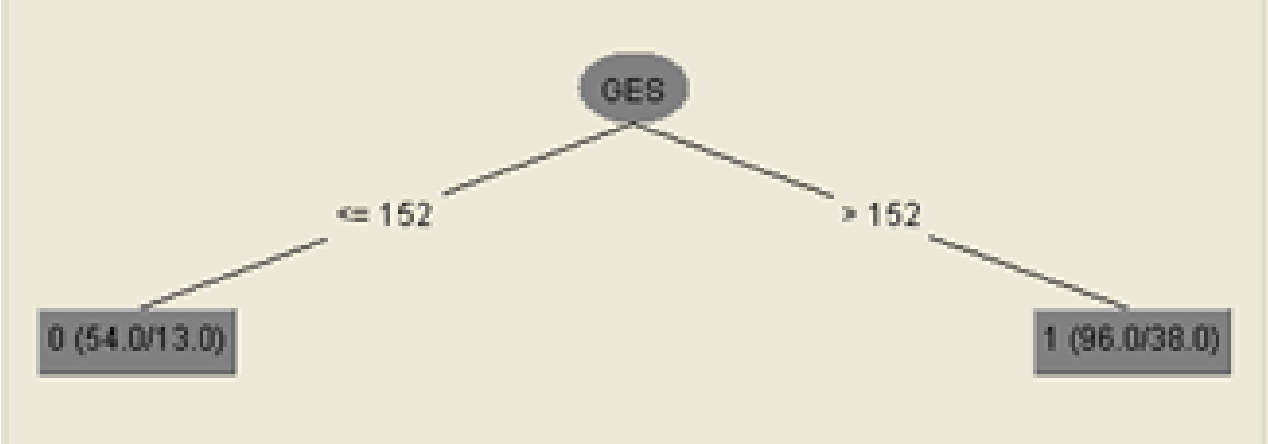
Summary

- Require more information on modern engineering disseminated in secondary schools

- NCEA in its current form poorly prepares students
  - Achievements and unit standards of little preparatory use
- Pastoral agent dramatically improves engagement
- Maths continues to be a major issue

Results (1)

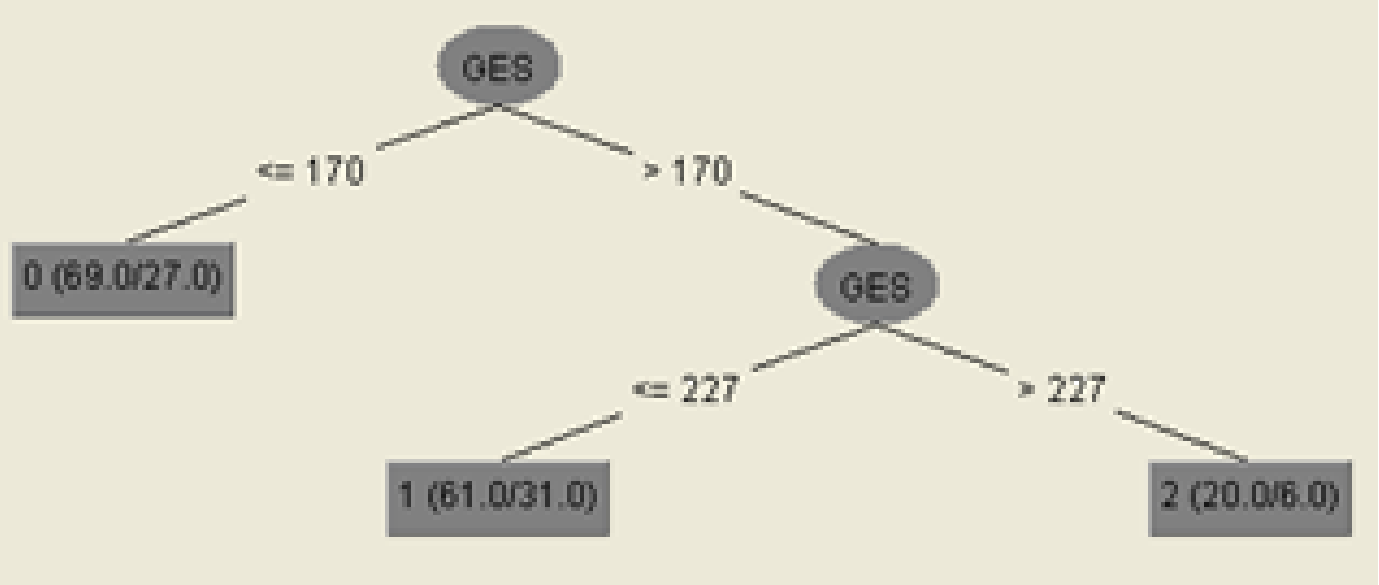
- Running data through data mining classifier on engineering dataset obtain value of 152



- But!
  - 24% of predicted failures, pass
  - 38% of predicted succeeds, failed

Results (3)

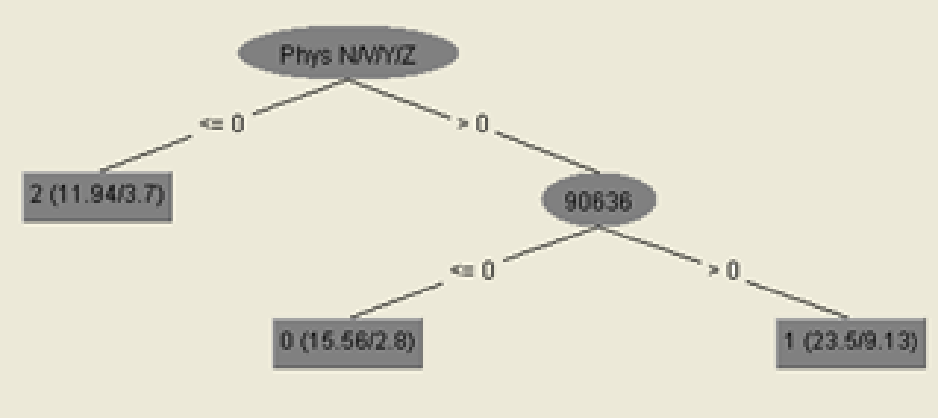
- For overall grade scores, ternary classifier



- 28% definite fails, passed
- 23% definite succeeds, failed

Results (3)

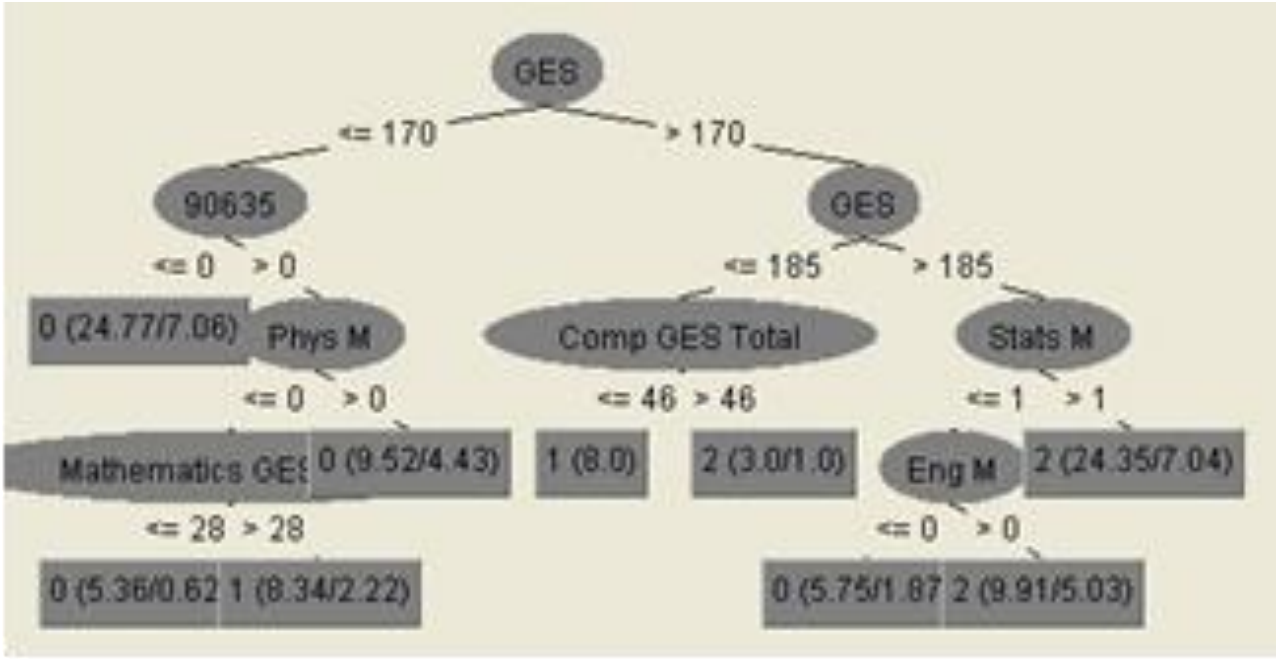
- For Electronics & Computer Systems



- Failure in 1 or more physics modules indicates probable failure
  - UNLESS integration module passed

Results (3)

- For Networking/Software



- No clear trend evident