ES112 Grading Scheme
Aug-Nov 2024

Step 1: Theory marks (total 50) were added in their absolute form.

Step 2: Lab exam marks (regular without bonus) normalization
- For Wednesday session (1.1+1.2+2.1+2.2); mean = *m1*
- For Friday session (3.1+3.2); mean = *m2*

Step 3: k = max(m1, m2) #easier lab session was the baseline without bonus mark

Step 4: Correction factor for mean equalization
- c (>=0.0) was identified for each lab session
- For a particular lab session, x:=x+c (capped at 15 for {Lab. 4, Lab. 8}, and 20 for Lab. 12) was added to each student's marks (x) such that the mean became equal to k across all lab sessions.

Step 5: For each student, corrected marks (total 50) were added across lab exams.

Step 6: Theory (50) + Lab (50) were summed to a total of 100. Note that bonus was not considered yet. Out of this total (100), the following statistics were obtained:

mean (**μ**)=47.276
median (**med**)=45.785
standard deviation (**σ**)=18.069
pass marks (P)=floor(**σ**)=18
#students=383

Step 7: Initial grading was performed as per the following criteria:

Range formula	Range (numerical)	Letter Grade
[2**μ**, …)	[94.552, ...)	A+
[**μ**+1.8**σ**, 2**μ**)	[79.8, 94.552)	A
[**μ**+**σ**, **μ**+1.8**σ**)	[65.345, 79.8)	A-
[**μ**+0.6**σ**, **μ**+**σ**)	[58.117, 65.345)	B
[**μ**, **μ**+0.6**σ**)	[47.276, 58.117)	B-
[**μ**-0.6**σ**, **μ**)	[36.435, 47.276)	C
[**μ**-**σ**, **μ**-0.6**σ**)	[29.207, 36.435)	C-
[floor(**σ**), **μ**-**σ**)	[18, 29.207)	D
[0, floor(**σ**))	[0, 18)	F

Step 8: For all students, bonus (normalized to 1 mark for each question; total: 6 questions, 6 marks) was added to form a final total as follows: **final total** = total (out of 100 as in Step 6) + bonus (normalized out of 6)

Step 9: Re-grading was performed by applying the criteria (same table as before) to the **final total** and the grading was terminated.

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