

ARCOS Group

**uc3m** | Universidad **Carlos III** de Madrid

# Course rules

Computer Structure  
Bachelor in Computer Science and Engineering



# Course profile

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- ▶ **COMPUTER STRUCTURE**
- ▶ Bachelor in Computer Science and Engineering
  - ▶ **REQUIRED**
  - ▶ ECTS Credits: **6**
  - ▶ Hours/week: **3**
- ▶ The purpose is to understand the basic concepts for designing computers

# Program

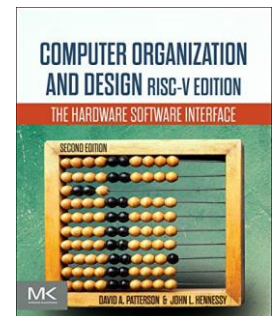
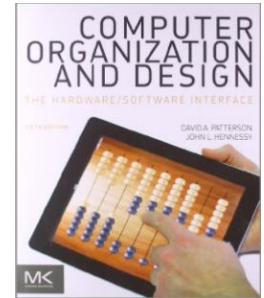
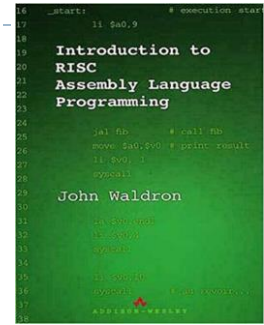
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1. Introduction to computers
2. Data representation and basic
3. Assembly programming
4. Processor
5. Memory hierarchy
6. Input/output systems

# Bibliography

- ▶ **Introduction to RISC Assembly Programming**  
J. Waldron,  
Editorial Addison-Wesley, 1999
- ▶ **Computer Organization and Design  
The Hardware/Software Interface**  
D.A. Patterson, J. Hennessy  
5<sup>th</sup> edition, 2014
- ▶ **Computer Organization and Design RISC-V  
Edition: The Hardware Software Interface**  
David A. Patterson John L. Hennessy,  
2<sup>th</sup> edition, 2021



# Methodology

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## ▶ Theory classes:

- ▶ Present and explain basic concepts.
- ▶ Students must also consult the textbooks (both for theory and problems); it is possible that the professor may not have time to explain all details during class! Ask anything that is unclear, ideally before exam week!!

## ▶ Problem solving in class:

- ▶ The professor will solve exercises to illustrate how to apply the concepts learned in the theory class.
- ▶ The students will solve exercises to make sure they get practical experience and they understand what concepts are still unclear.

## ▶ Lab work:

- ▶ Several sets of problems, solved in groups to encourage teamwork.

# Schedule

Week	Session	Description	Tuesday	Friday	
1	1	Introduction	07-sep		
1	2	Review of representation and floating point		10-sep	
2	3	Computer programming model	14-sep		
2	4	Exercises		17-sep	
3	5	Data, instructions and control structures	21-sep		
3	6			24-sep	Laboratory
4	7	Addressing modes. Functions and stack usage (I)	28-sep		
4	8	Exercises		01-oct	
5	9	Functions and stack usage (II)	05-oct		
5	10	Exercises + mini-Exam		08-oct	mini-Exam
6	11	Computer structure	14-oct		recovering (holiday)
6	12			15-oct	Laboratory
7	14	Elemental operations	19-oct		
7	15	Exercises		22-oct	
8	16	Control unit design	26-oct		
8	17			29-oct	Laboratory
9	18	Interruptions, booting and processor state	02-nov		
9	19	Exercises + mini-Exam		05-nov	mini-Exam
10	20	Memory system	09-nov		
10	21	Exercises		12-nov	
11	22	Cache system	16-nov		
11	23			19-nov	Laboratory
12	24	Virtual memory	23-nov		
12	25	Exercises		26-nov	
13	26	Exercises	30-nov		
13	27	Exercises + mini-Exam		03-dic	mini-Exam
14	28		07-dic		
14	28	I/O system		10-dic	
15	29	I/O techniques	14-dic		
16	30	Exercises		17-dic	session 29

- ▶ 15 weeks, 29 classes in total:
  - ▶ 14 classes: magistral classes
  - ▶ 11 classes: exercises + review + mini-exam
  - ▶ 4 laboratory classes

# COVID rules

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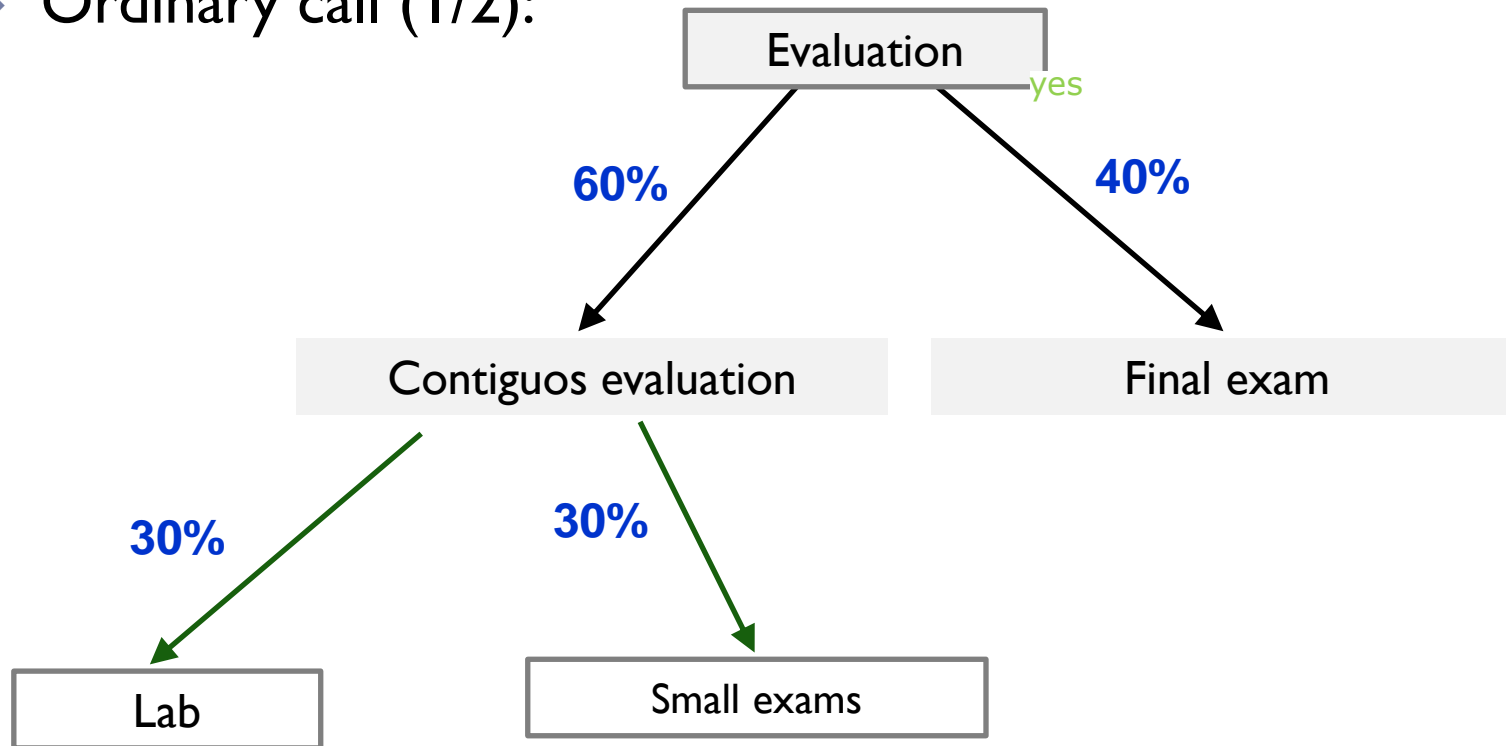


- ▶ **Personal attendance**
  - ▶ Office hours: on-line (appointment required).
- ▶ **Classes:**
  - ▶ Rotation system: classes will be streamed (Blackboard).
  - ▶ Doors and windows opened during class.
  - ▶ Face mask is mandatory.
- ▶ **Please check latest information at:**  
<https://www.uc3m.es/covid19/inicio>

# Evaluation



## ► Ordinary call (1/2):

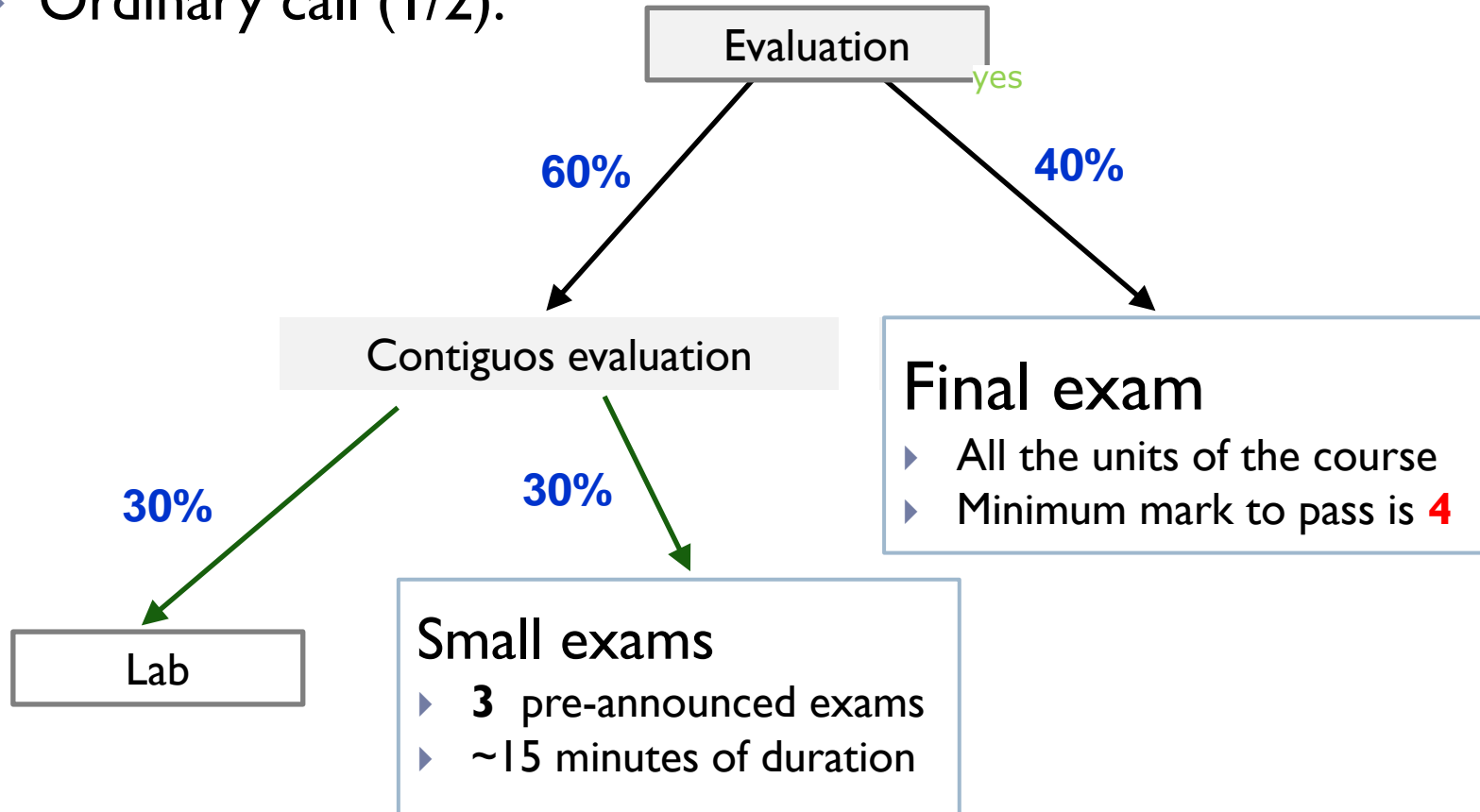




# Evaluation



## ► Ordinary call (1/2):

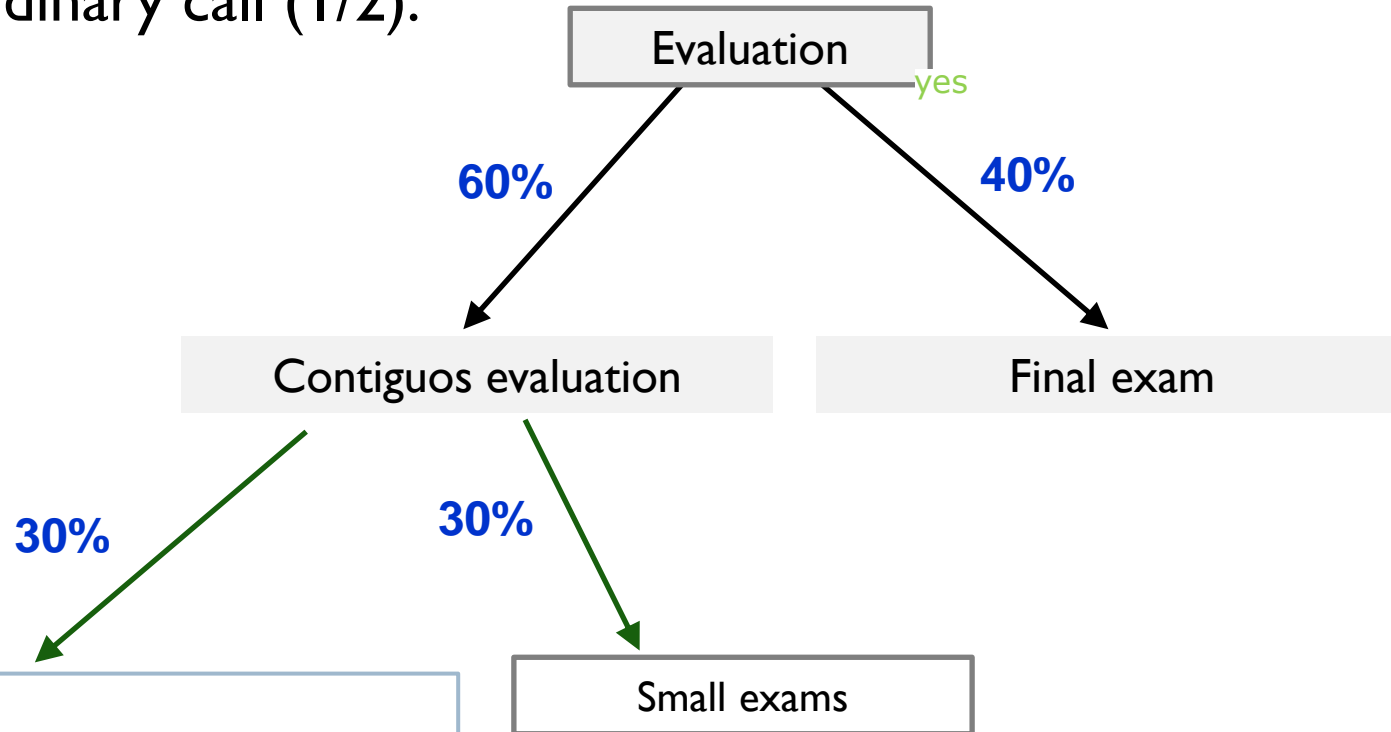


**Extra point if the grade is greater than 7 in the contiguous evaluation**

# Evaluation



## ► Ordinary call (1/2):



### Labs

- 2 assignments (15% each)
- **Up to 2** students per group
- Minimum score:  
each lab  $\geq 2$  AND  $\text{avg}(\text{labs}) \geq 4$

# Evaluation: labs

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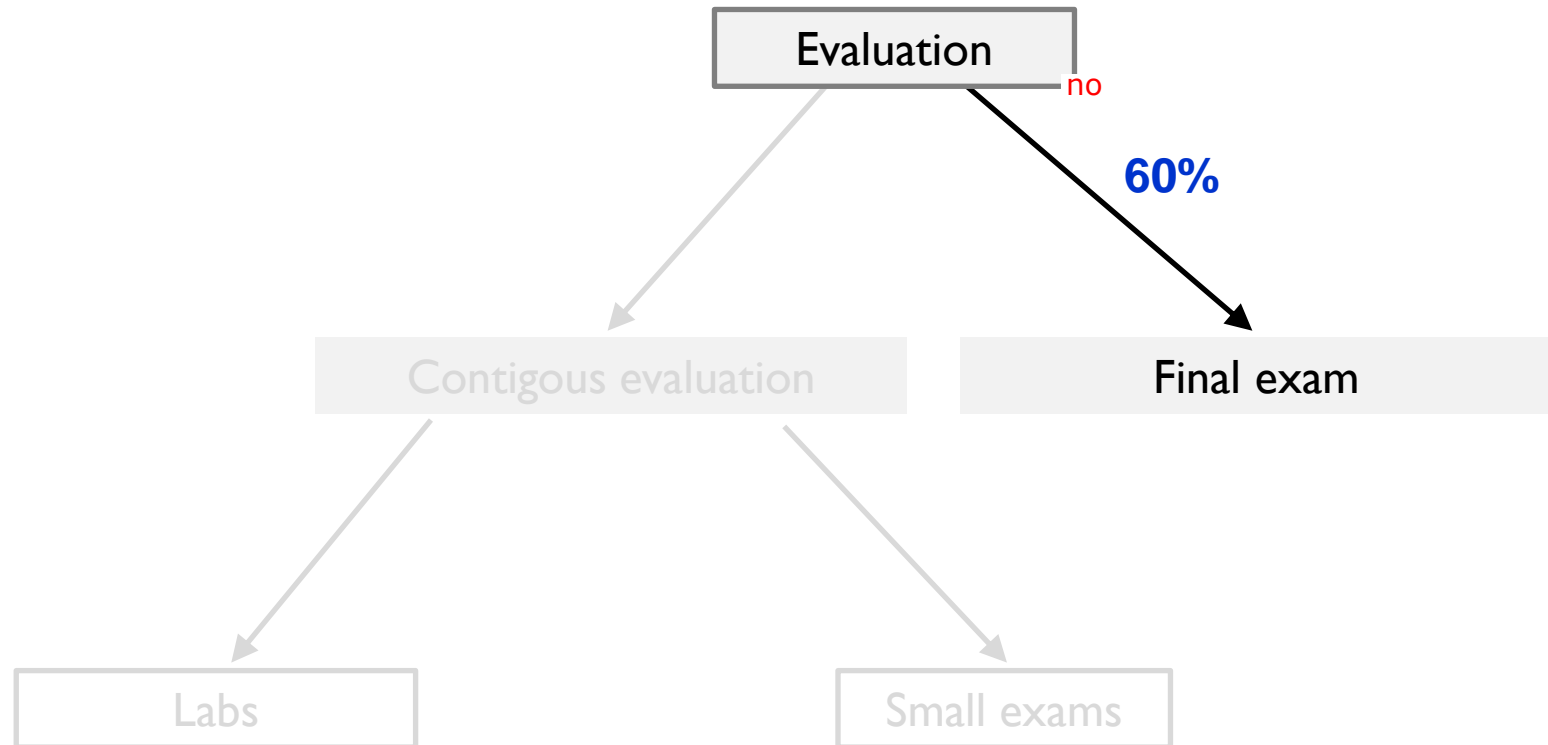


- ▶ **2 programming assignments (30%)**
  - ▶ Each assignment has a score of **15%**
  - ▶ Minimum score to pass is:
    - ▶ (2 over 10 for each one) AND (4 over 10 on contiguous evaluation)
- ▶ **Up to 2 students per group (max)**
  
- ▶ **4 Laboratories classes**
  - ▶ Attending is not mandatory (but recommendable)
  - ▶ Schedule
    - ▶ September 23 | 24
    - ▶ October 14 | 15
    - ▶ October 28 | 29
    - ▶ November 18 | 19

# Student evaluation



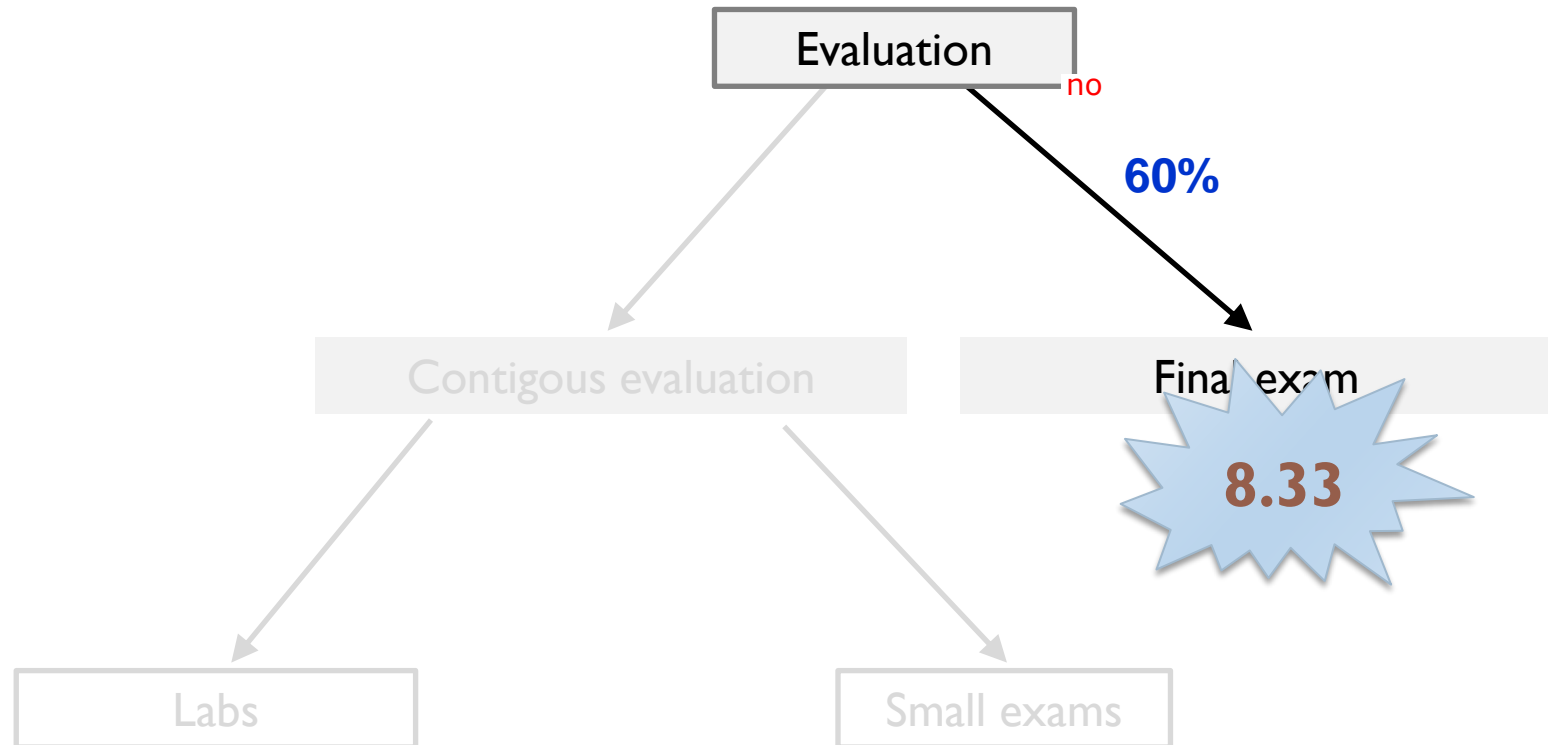
## ► Ordinary call (2/2):



# Evaluation



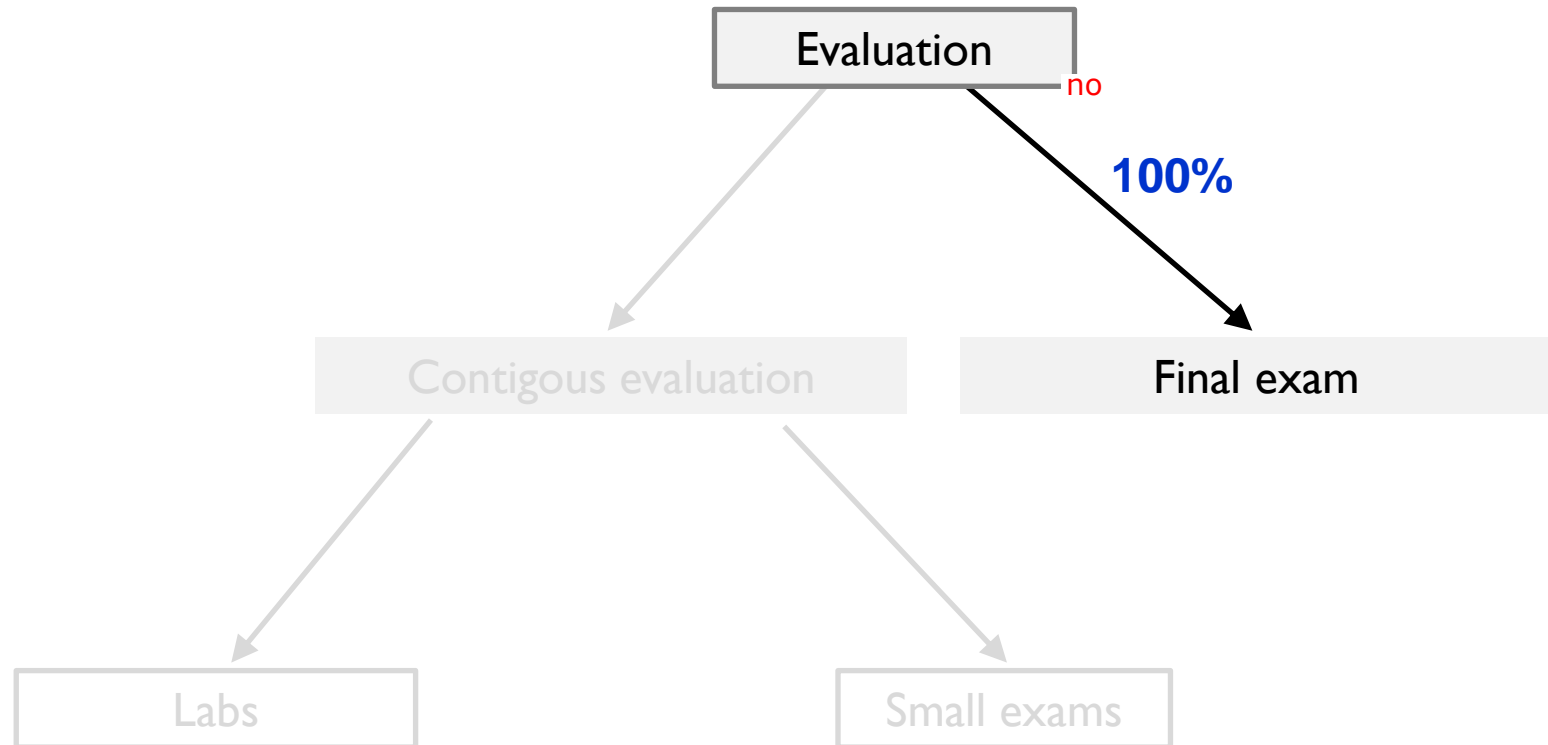
## ► Ordinary call (2/2):



# Evaluation



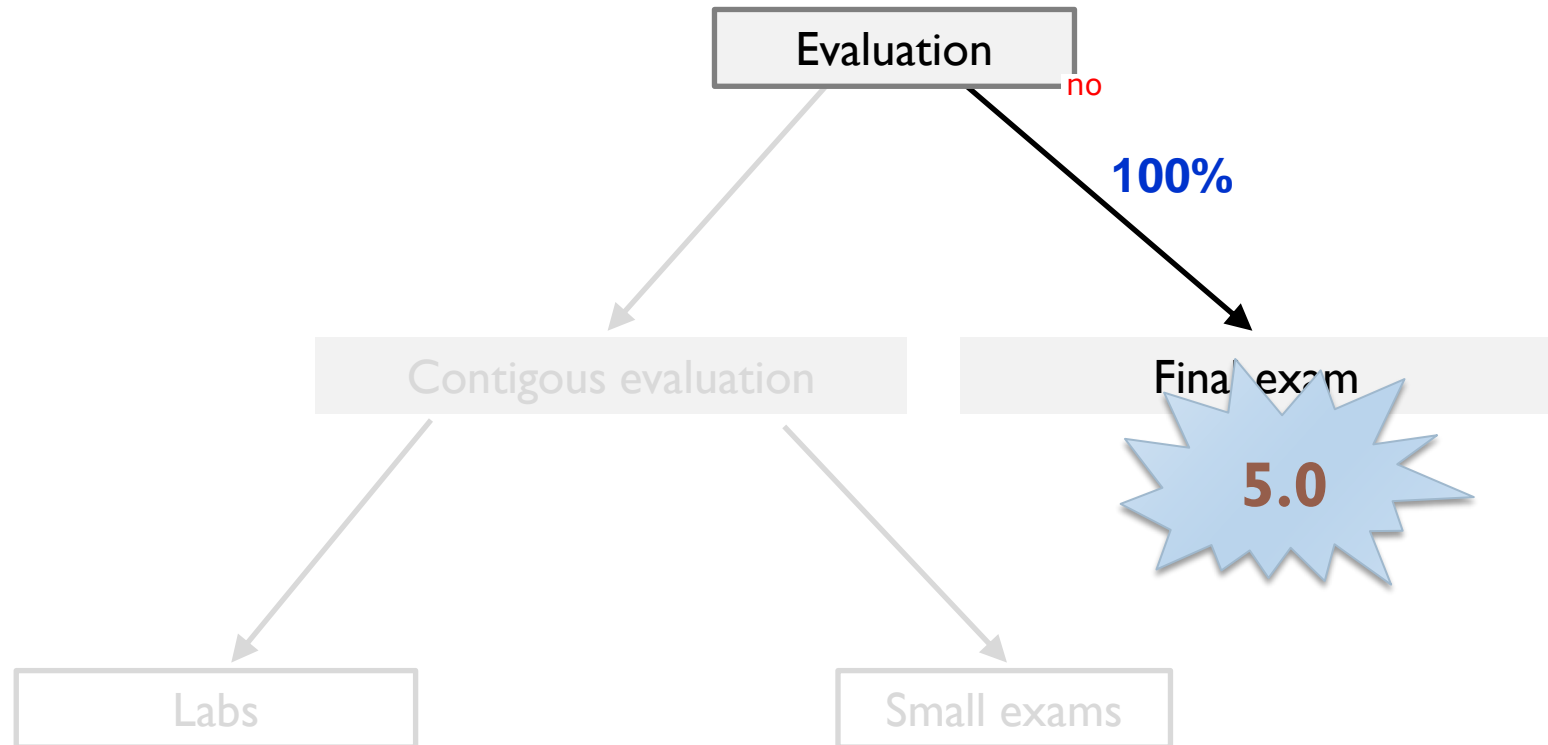
## ► Extraordinary call (1/2):



# Evaluation



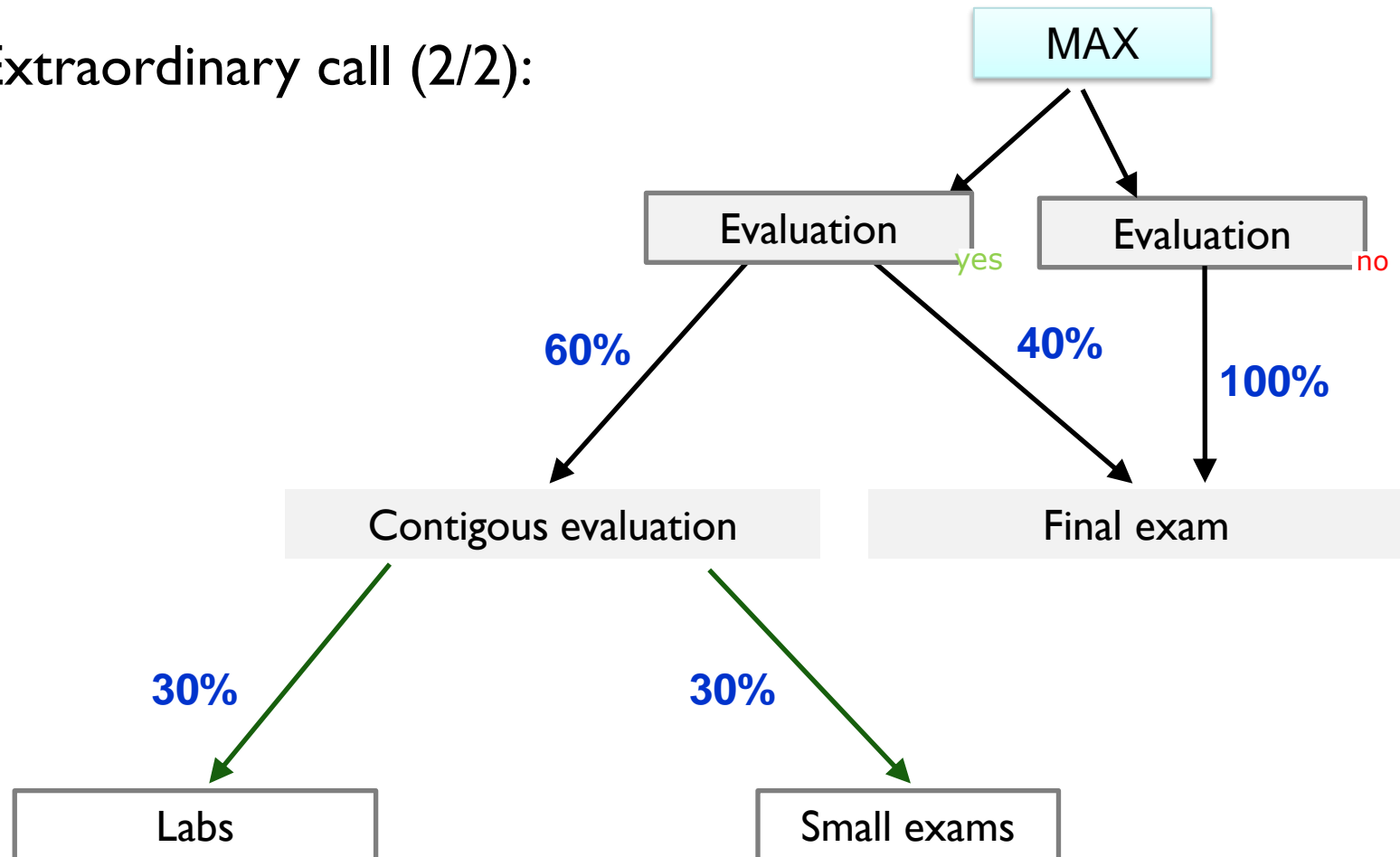
## ► Extraordinary call (1/2):



# Evaluation



## ► Extraordinary call (2/2):





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