



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

BIOINFORMATICS LAB

Episode III – Phylogenetic Analysis

Federico M. Giorgi, PhD

Department of Pharmacy and Biotechnology
First Cycle Degree in Genomics

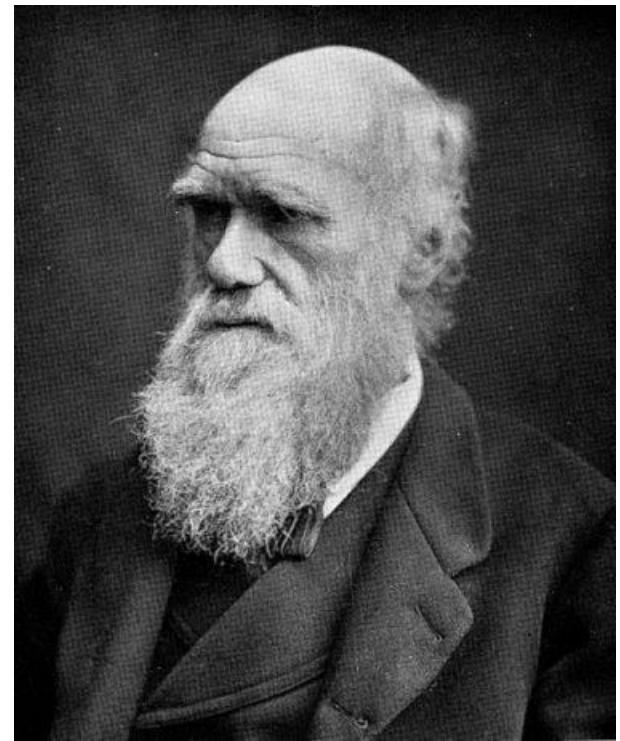
Phylogeny

The history of the evolution of a species or group



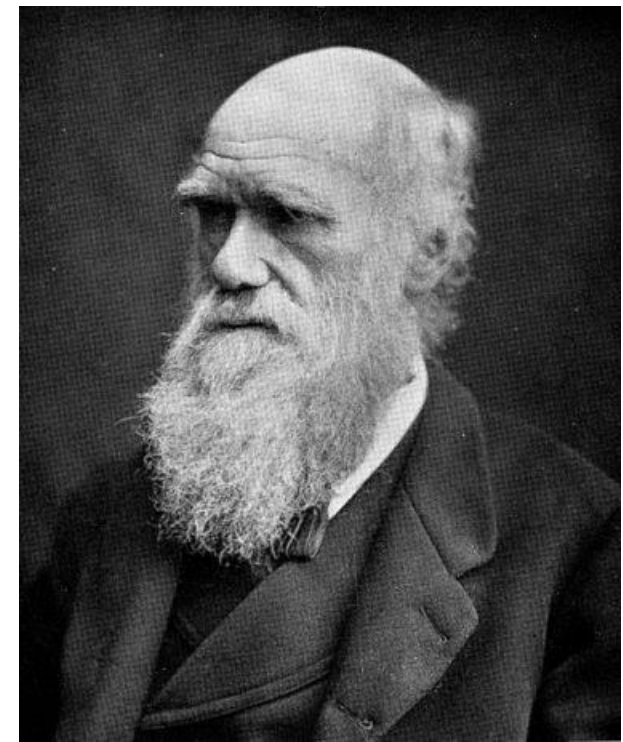
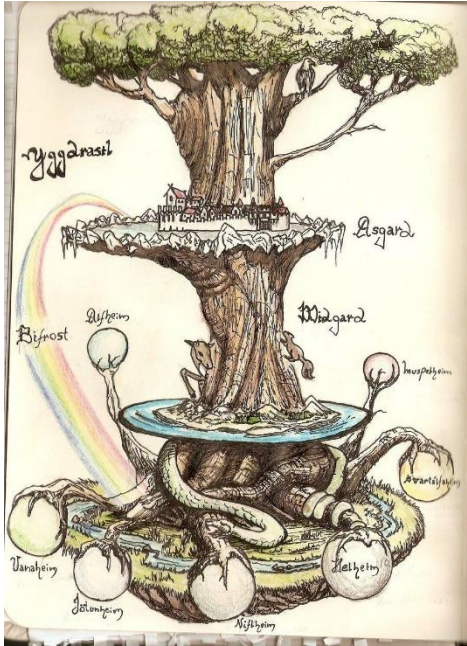
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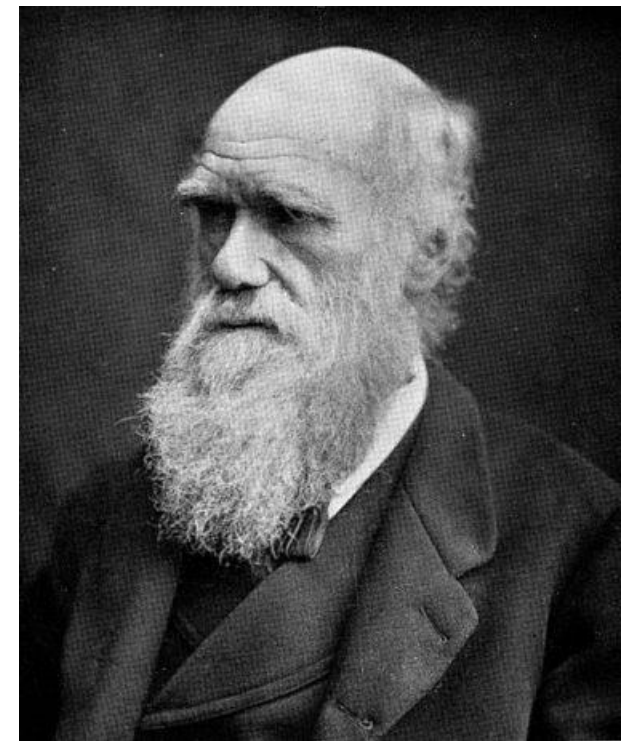
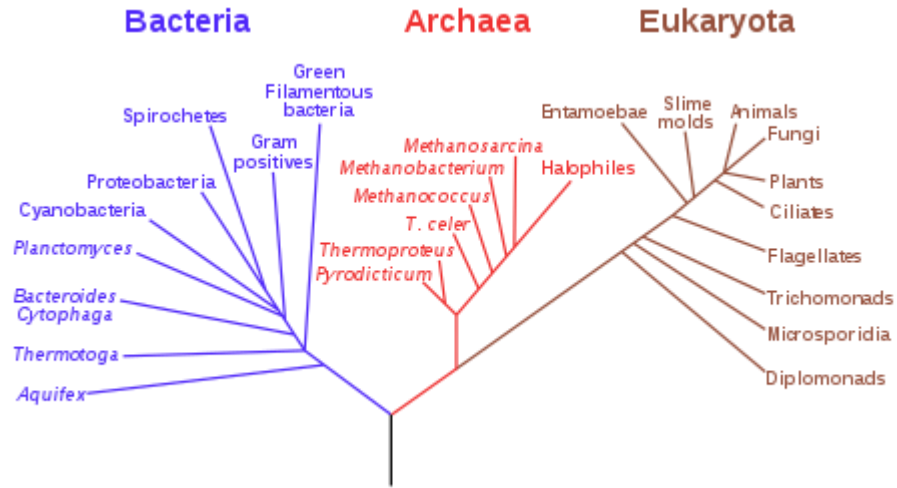
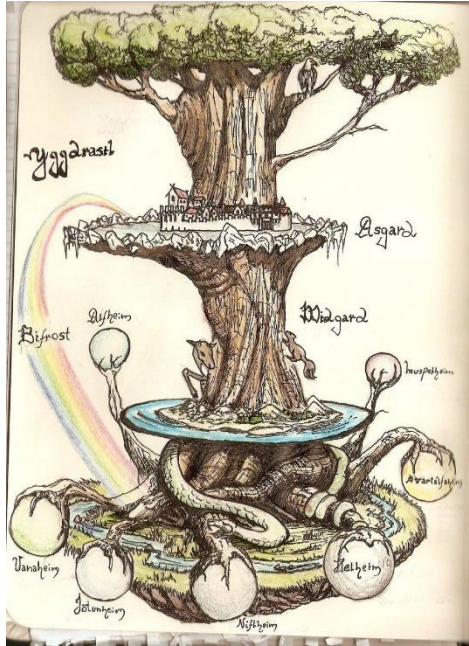
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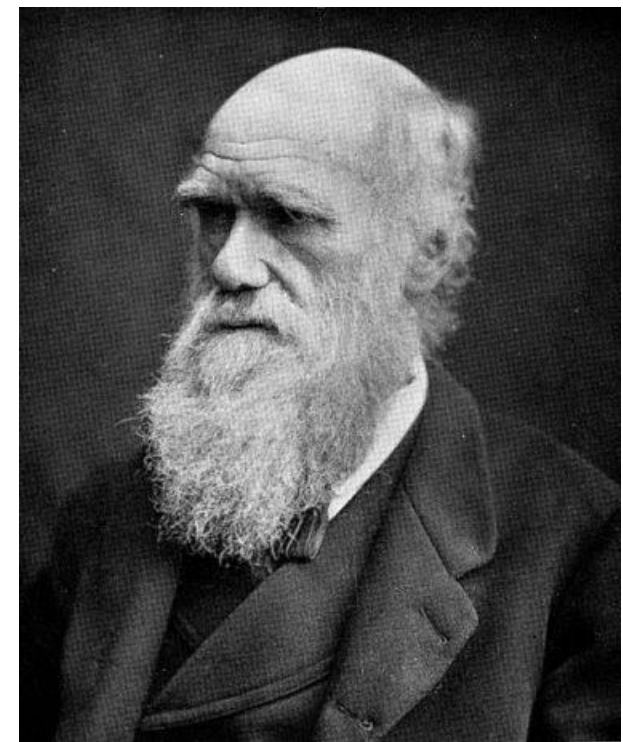
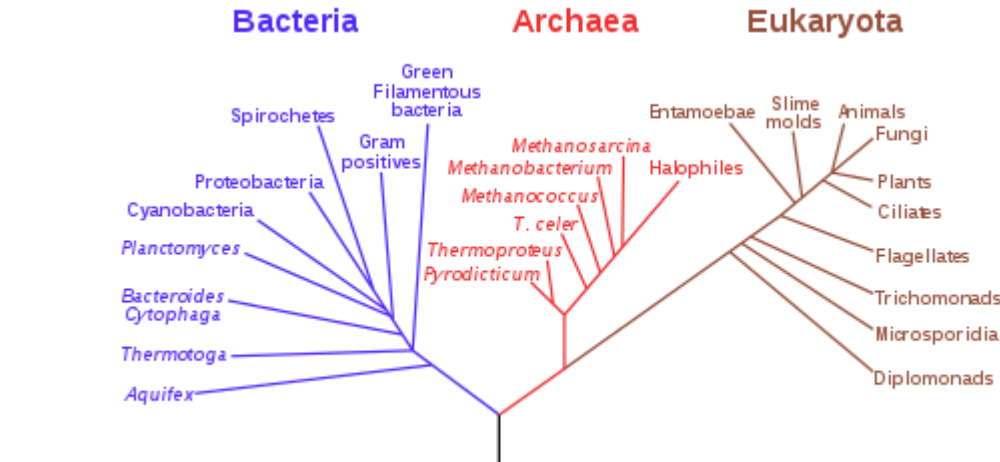
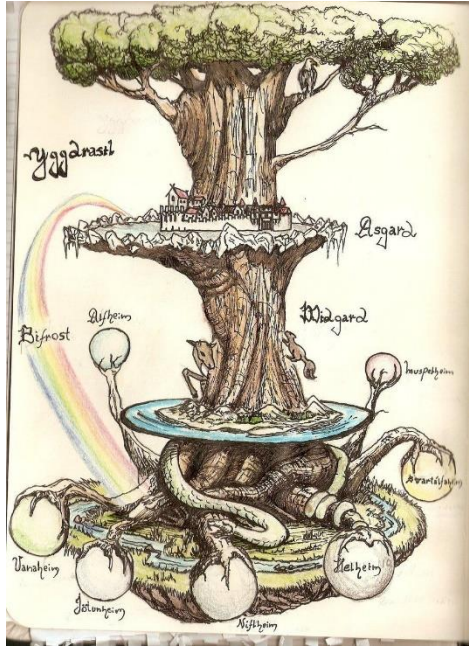
Phylogeny

The history of the evolution of a species or group



Phylogeny

The history of the evolution of a species or group



Q5E940	BOVIN	-----MPREDRATWKSNSYFLKIIQLLDDYPKCFIVGADNVGSKMQQIRMSLRGK-AVVLMGKNTMMRKAIRGHLENN--PALE	76
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RLA0	RAT	-----MPREDRATWKSNSYFLKIIQLLDDYPKCFIVGADNVGSKMQQIRMSLRGK-AVVLMGKNTMMRKAIRGHLENN--PALE	76
RLA0	CHICK	-----MPREDRATWKSNSYFPMKIIQLLDDYPKCFVVGADNVGSKMQQIRMSLRGK-AVVLMGKNTMMRKAIRGHLENN--PALE	76
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Q54LPO	DICDI	MSGAG-SKRKNVFTEKATKLFVTDKMIVAEADFVGSQLOKIRKSIRGI-GAVLMGKNTMIRKVIIRDADSK--PELD	75
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RLA0	SULAC	MIGLAVTTTKKIAKWKVDEVAELTEKLTIKTIIIANIEGFPADKLHEIRKKLRGK-ADIKVTKNLNFNIALKNAG---YDLK	79
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RLA0	SULSO	MKRLALALKQRKVASWKLLEEVKELTELKIKNSNTILLGNLEGFPADKLHEIRKKLRGK-ADIKVTKNLNFNIALKNAG---IDIE	80
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RLA0	PYRAE	MMLAIGKRRYVRTQYPAKRVKIVSEATELLQKYPVFLFDLHGLSSRILHEVYRRLRY-GVIKIIKPLFKTAFTKVVYGG---IPAE	85
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RLA0	HALSA	MSAEQRTEVEVPEWKRQEVDELVDLLETDSVGVVNIAGIPSRLODMRRDLHGT-AELRVSNTLIE LAIKKAAKELGKPELE	79
RLA0	THEAC	MKEVSQOKKELVNETTRIKASRSVAIVDTAGIRTRQIODIRGKNRGK-INLKVIKNTLIE LAIKKAAKELGKPELE	72
RLA0	THEVO	MKRLNPKKKEIVSELAGDITKSKAVAVDIKGVRTROMODIRAKNRDK-VKIKVVKNTLIE LAIKKAAKELGKPELE	72
RLA0	PICTO	MTEPAQWKIDFVKNLEINSRKVAALVSIKGLRNNEFKIIRNSIRDK-ARIKVSARLLRLAIENTGK---NNIV	72
	ruler	1.....10.....20.....30.....40.....50.....60.....70.....80.....90	

The Five Practical Stages of Phylogenetic Analysis

1. Sequence Acquisition

2. Multiple Sequence Alignment

3. Specify Model for Nucleotide/Amino acid evolution

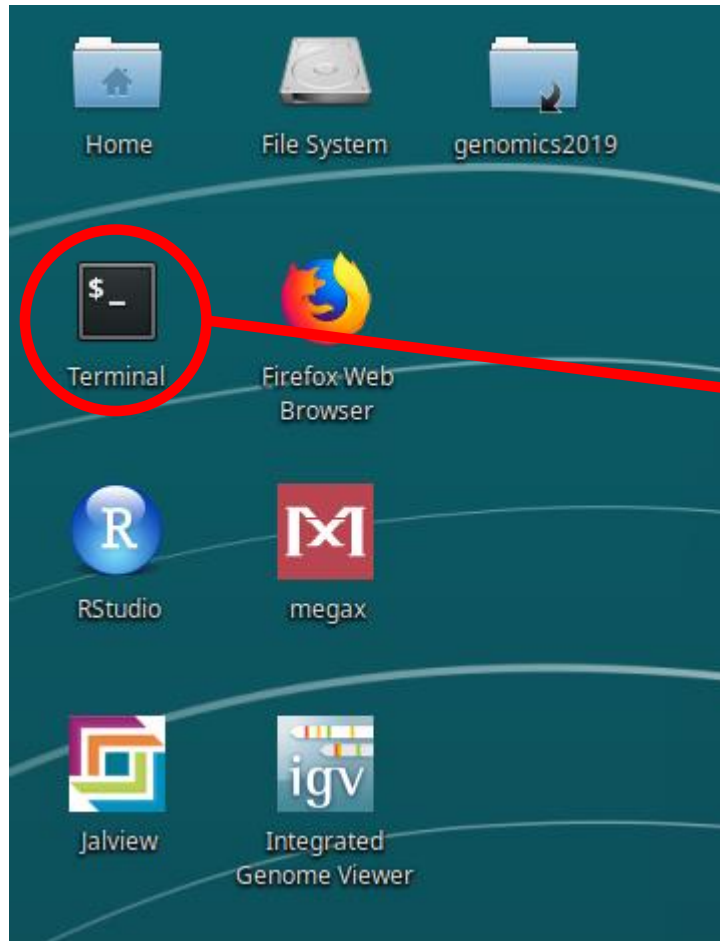
statistical models to estimate the number of changes that occurred between multiple sequences
(simplest is Hamming distance = nr. differences)

4. Tree Building

5. Tree Evaluation



Let's open The Terminal!



Reminders:

- userid **student**
- password **4genomics4**



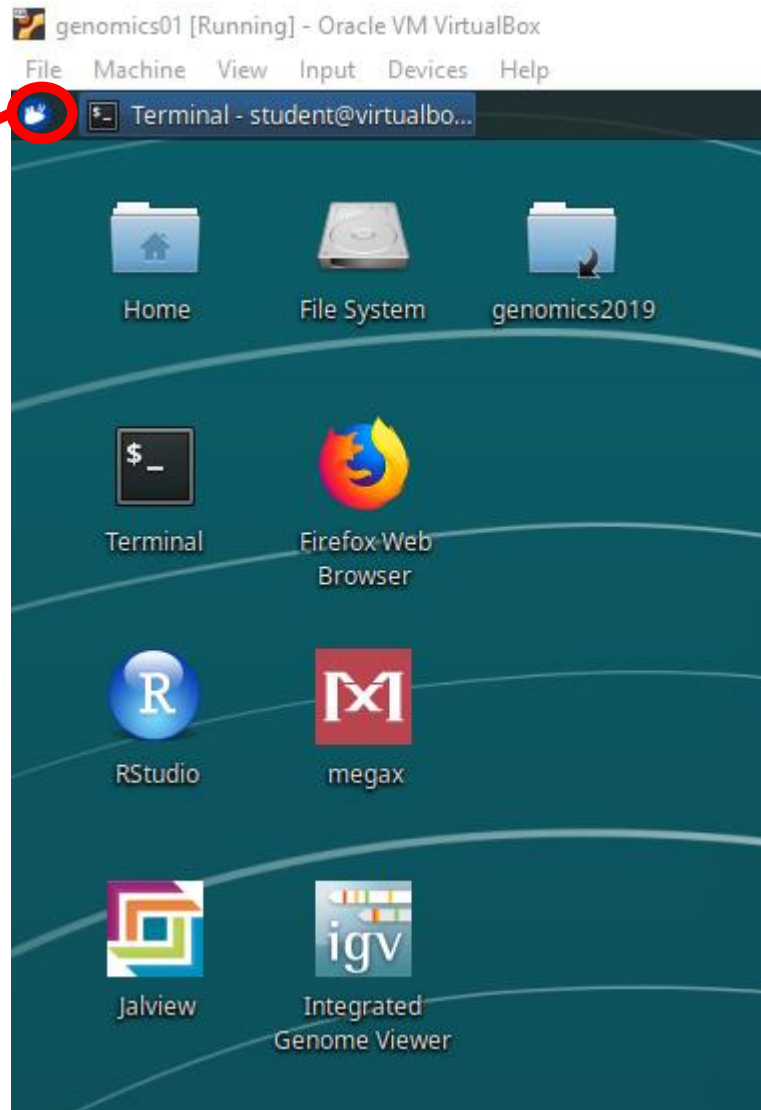
Sequences Exercises

(Open exercises_03_phylogeny.pdf)



Turn Unix off CORRECTLY

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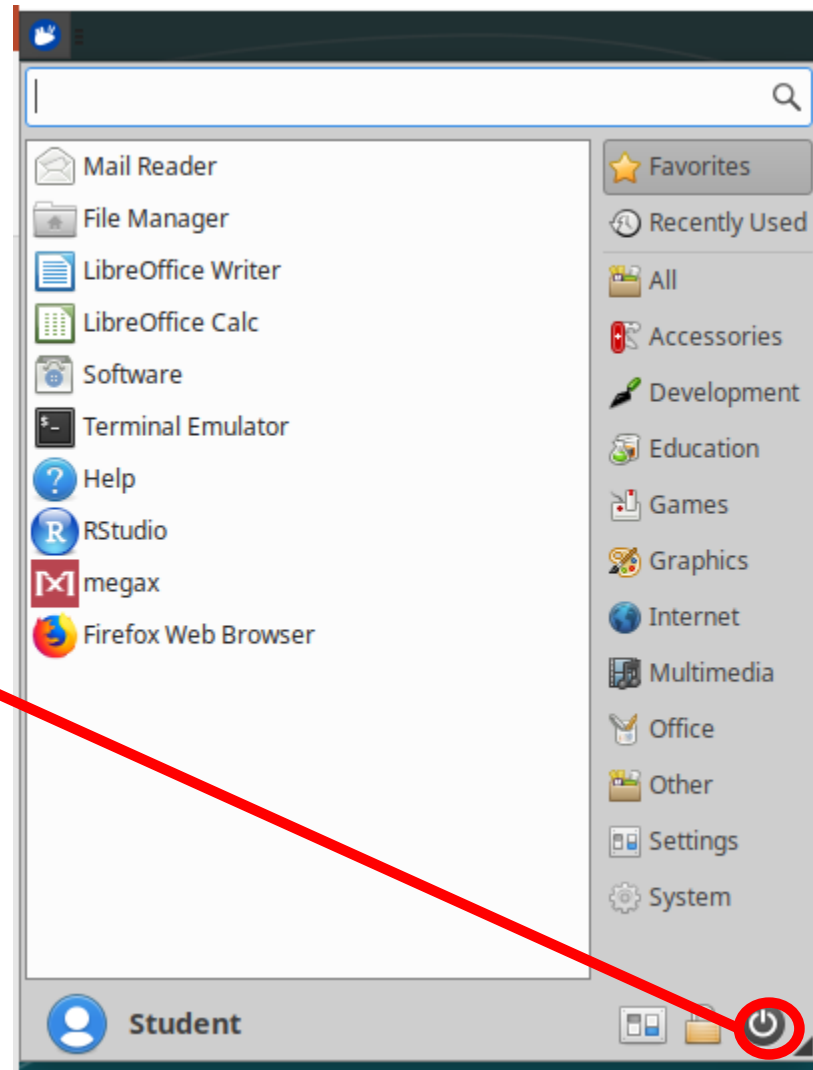


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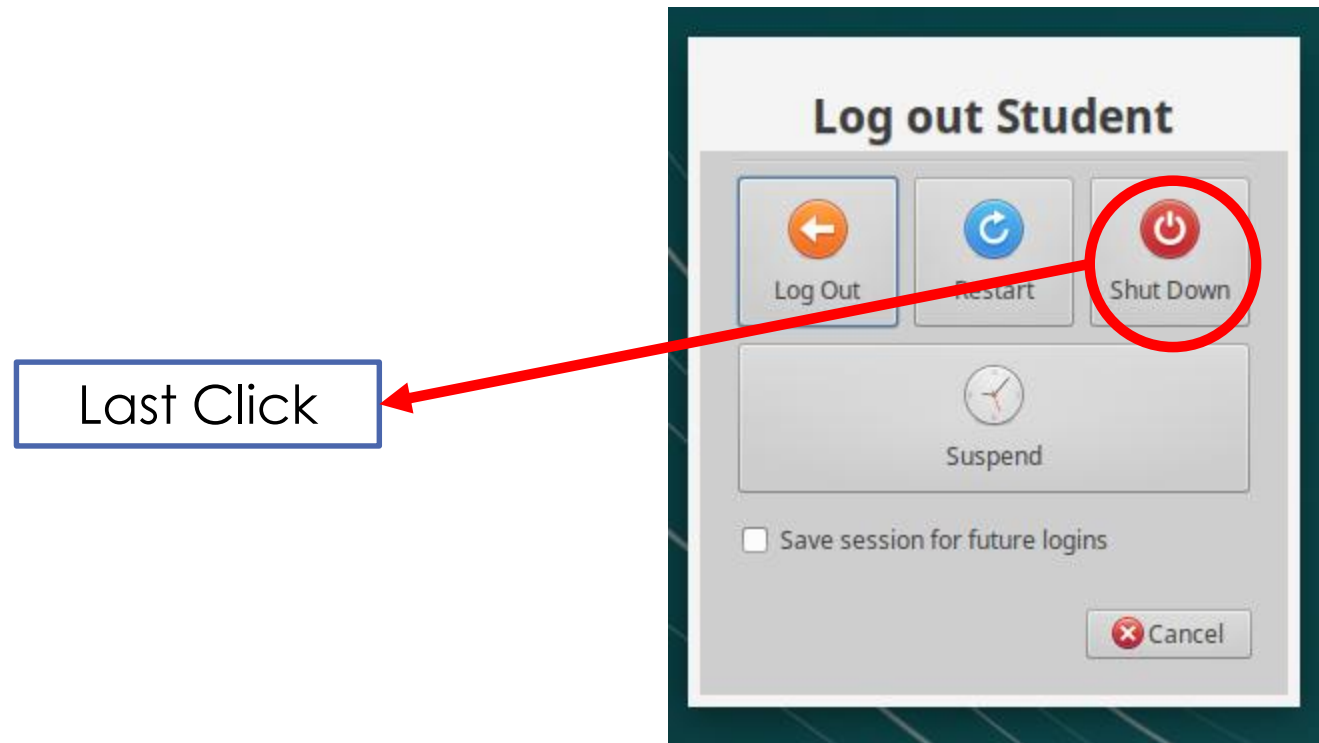
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Click Again



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