The Vertebral Phylogeny and Steps to Forming an Evolutionary Cladogram

By: Baies Haqani
6876339

BIO1130 Section A8

Demonstrators:
Alison
Kevin

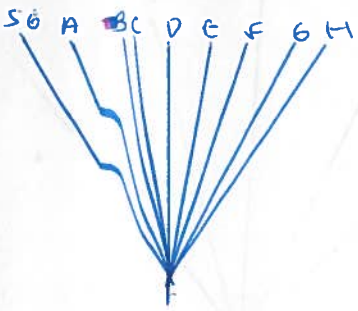
Nov 21, 2012

Department of Biology

University of Ottawa

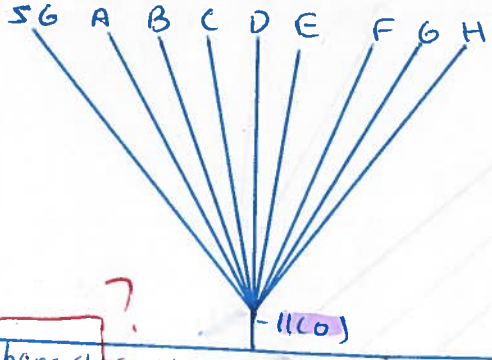
Bales Hagani
6876339

Initial Cladogram (1)



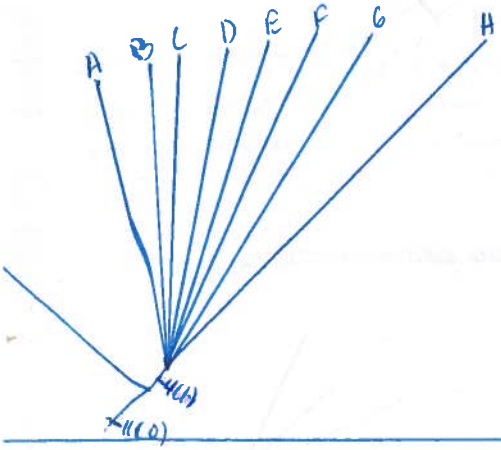
All species share a common ancestor

(2) Character: Notochord (11)



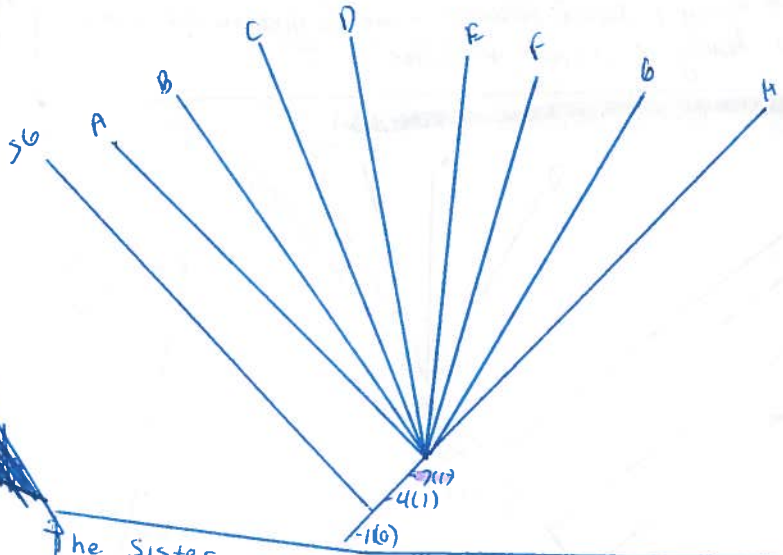
This character is present in all the species including the sister group.

Character: Jaws (4) (3)



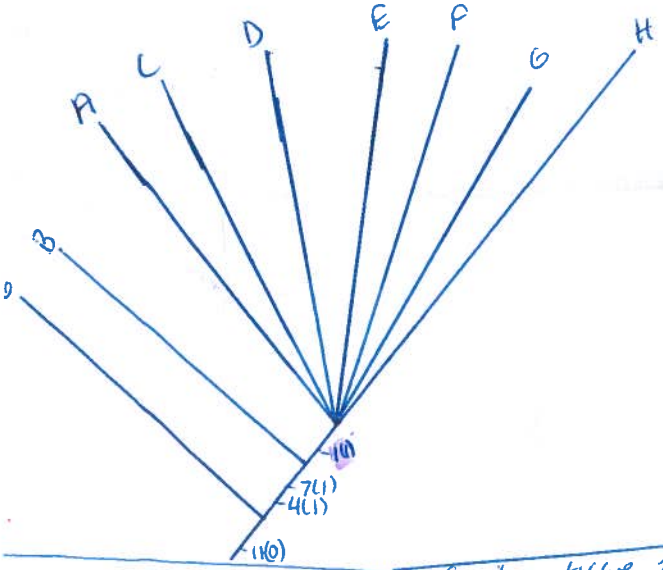
The sister group doesnot posses a jaw owever all the other species show this apomorphic Trait

(4) Character: Stomach (7)



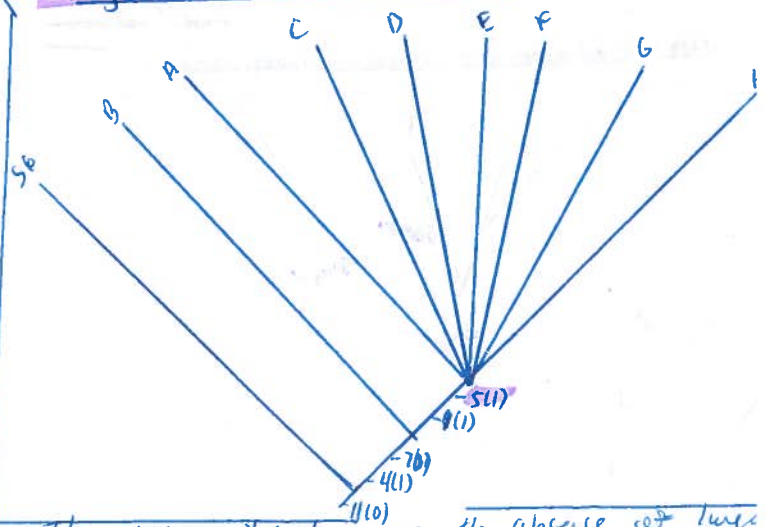
he Sister group does not posses a stomach however all the other species show the apomorphic Trait

Character: Skeletal tissue (1) (5)



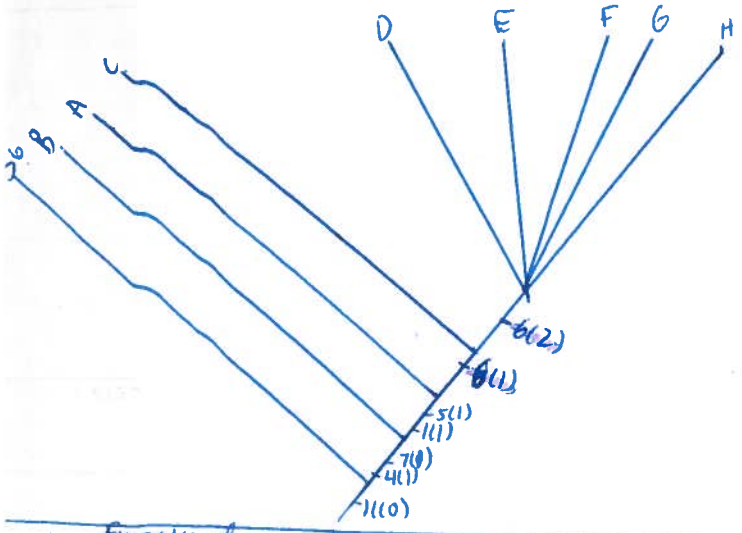
The plesomorphic trait is the Cartilage tissue trait which is shared by the sharks however, the apomorphic trait shared by the rest of the species is the skeletal tissue

(6) Lungs and Derivatives (5)



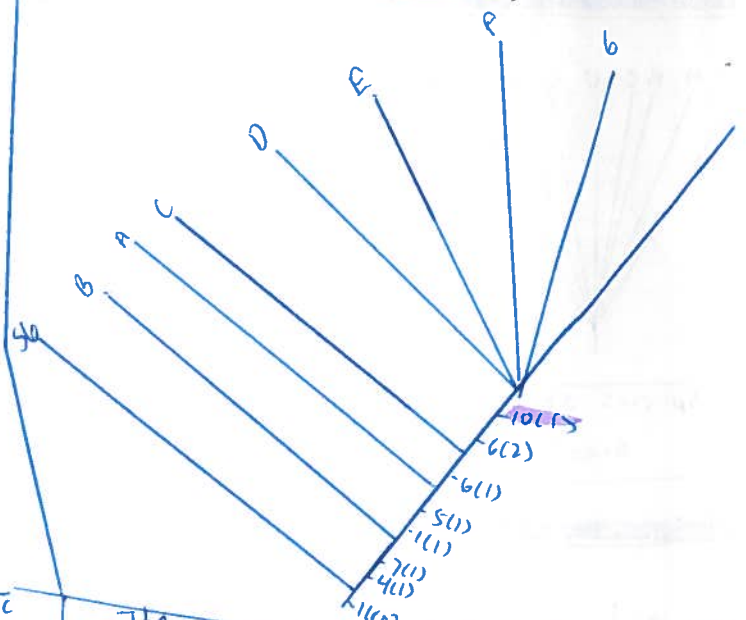
The plesomorphic trait was the absence of lungs and its derivatives which is shared by the sharks however the apomorphic trait is shared by the rest of the species is the lungs and derivatives

Character Sacral Vertebral (6) (7)



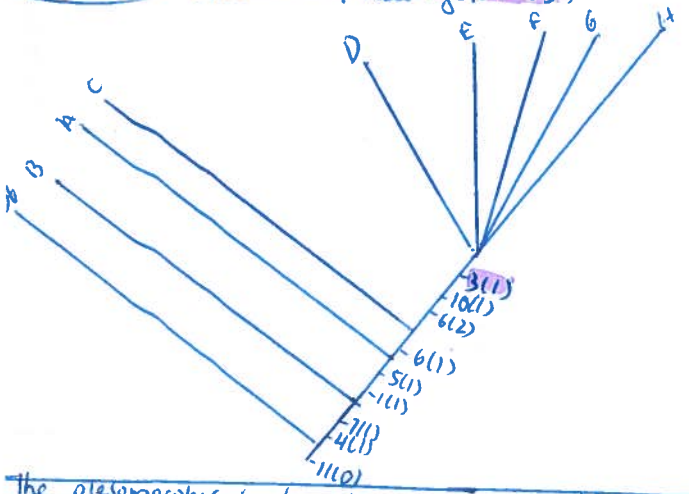
The ~~Functional~~ ~~plesomorphic~~ outgroup method was used. The plesomorphic trait was the absence of the Sacral vertebrae. The lesser apomorphic trait was having 1 Sacral vertebrae while the greater apomorphic trait was having 2 Sacral Vertebrae.

Character: Amnion (10) (8)



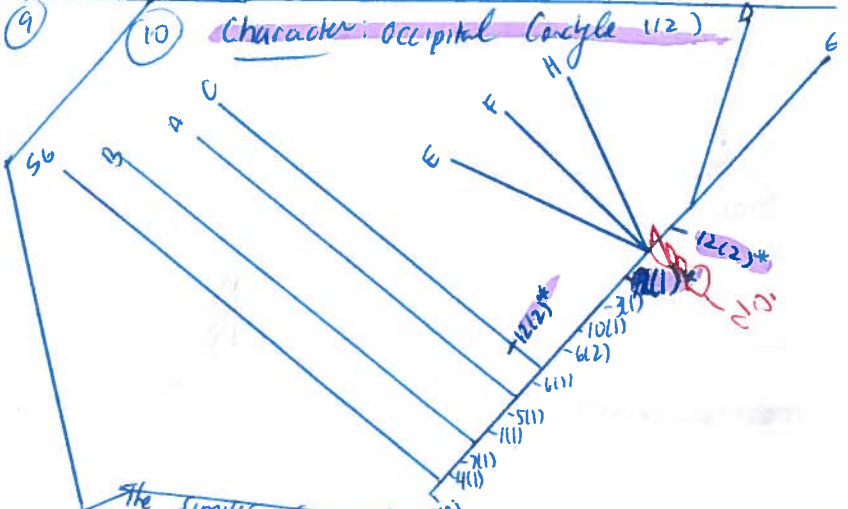
The plesiomorphic trait of the sister Group is an absence of an embryonic membr However, the presence of the embryonic membrane is shared by the rest of the Species besides the Shark, per and mudpuppy.

Character: Adult nlephridal system (3) (9)



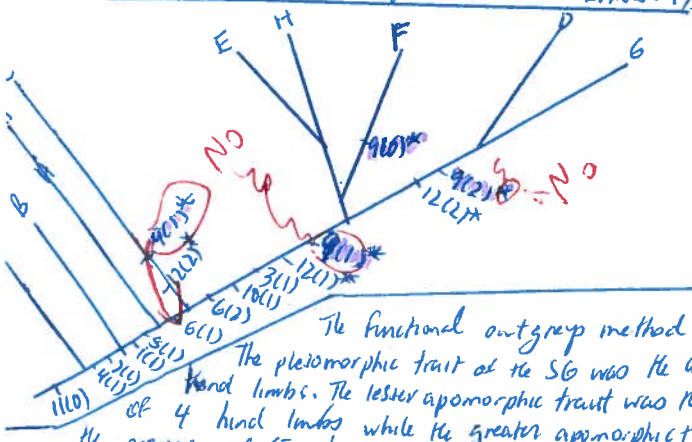
The plesomorphic trait of the sister group is the mesonephros kidney shared by the Shark, perch and mudpuppy. The apomorphic trait shared by the rest of the species is the ~~metanephros kidney~~ system.

Character: Occipital Condyle (12) (10)



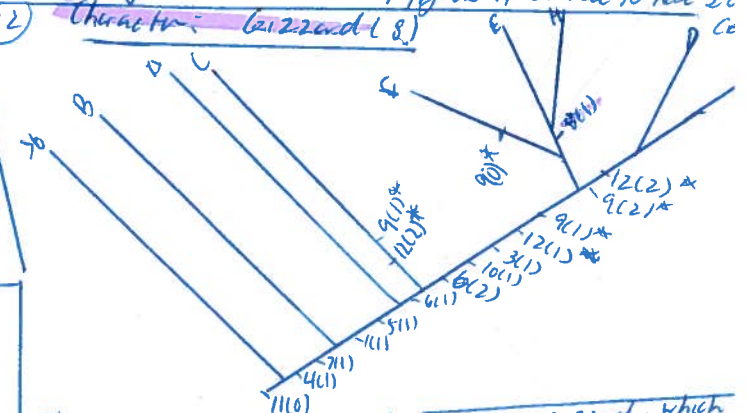
The similar functional outgroup method was used. The plesiomorphic trait of the sister group is the absence of Occipital condyle. The lesser apomorphic trait was having 1 occ Condyle while the greater apomorphic trait was the presence of Occipital Condyles. This evolutionary hypothesis contains a convo homoplasy occured for the mudpuppy as it evolved to have 2 C

Character: Number of digits in hind Limb (4) (11)



The functional outgroup method was used. The plesiomorphic trait of the SG was the absence of hind limbs. The lesser apomorphic trait was the presence of 4 hind limbs while the greater apomorphic trait was the presence of 5 digits. This evolutionary hypothesis shows reversal homoplasy occured for the Snake as it evolved to possess no limbs.

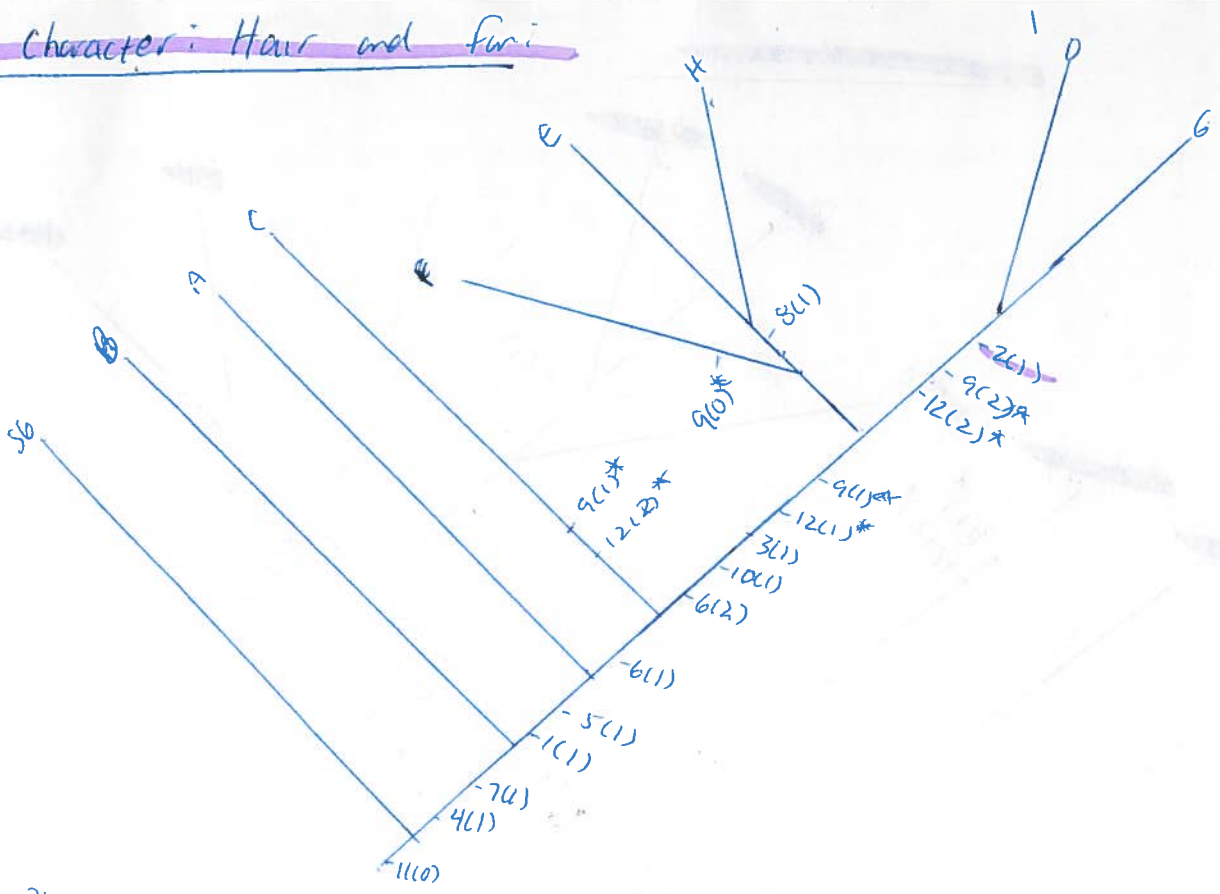
Character: (12:2:and (8)



The plesiomorphic trait of the SG is no gizzard, which is shared by every species except the Crocodile/alligator. However, the gizzard is an apomorphic trait that occurs within the small monophyletic group

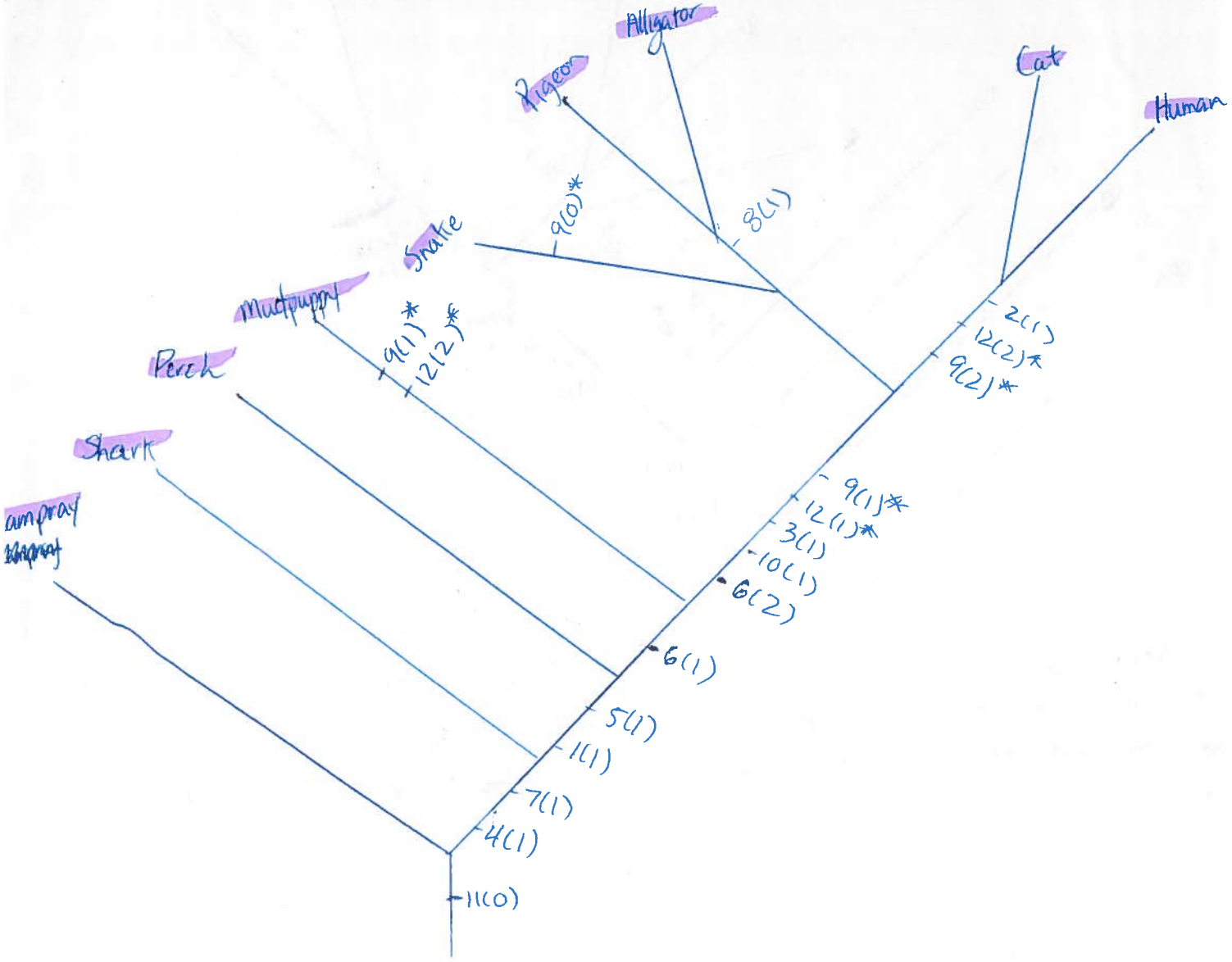
(13) Character: Hair and fur

Bailes Ha
68763



The Plesomorphic trait of the sister group is the absence of hair or fur which is shared within all the species except the cat and human. The presence of hair and fur is an apomorphic trait that got passed down within the ~~one~~ monophyletic group from the sister groups over a period of time.

Final Cladogram



Conclusion: The Species on my cladogram that are endo-thermic are the ~~Cat and~~ Pigeon, Cat, and human. Endothermy is present towards the end of the Cladogram within the monophyletic ~~including the Pigeon~~ groups, however, Convergent homopla must have taken place whereby, the Pigeon ~~lizard~~ adopted the endotherm Character, however, ~~it is~~ it is in a different monophyletic group in the Cladogram This would make sense in present day animals because most have adopted the endothermic characteristics however, Species prior to this ingroup have all adop the plesomorphic trait of being ectothermic.

Corrected Coded matrix

Student 6876339: Matrix score= 8/12

Lab section

BIO1130

		1 Skeletal Tissue	2 Hair or Fur	3 Adult Neph. system	4 Jaws	5 Lungs and Derivatives	6 Sacral Vertebrae	7 Stomach	8 Gizzard	9 No. of digits on hind limb	10 Amnion	11 Notochord	12 Occipital Condyles	
SG	Lamprey	0	0	0	0	0	0	0	0	0	0	0	0	SG
A	Perch	1	0	0	1	1	0	1	0	0	0	0	0	A
B	Shark	0	0	0	1	0	0	1	0	0	0	0	0	B
C	Mudpuppy	1	0	0	1	1	1	1	0	1	0	0	2	C
D	human	1	1	1	1	1	2	1	0	2	1	0	2	D
E	Pigeon	1	0	1	1	1	2	1	1	1	1	0	1	E
F	snake	1	0	1	1	1	2	1	0	0	1	0	1	F
G	Cat	1	1	1	1	1	2	1	0	2	1	0	2	G
H	Crocodile/alligator	1	0	1	1	1	2	1	1	1	1	0	1	H

THIS IS YOUR CORRECTED MATRIX - PRINT IT AND ATTACH IT TO YOUR REPORT

USE THIS MATRIX TO BUILD YOUR CLADOGRAM