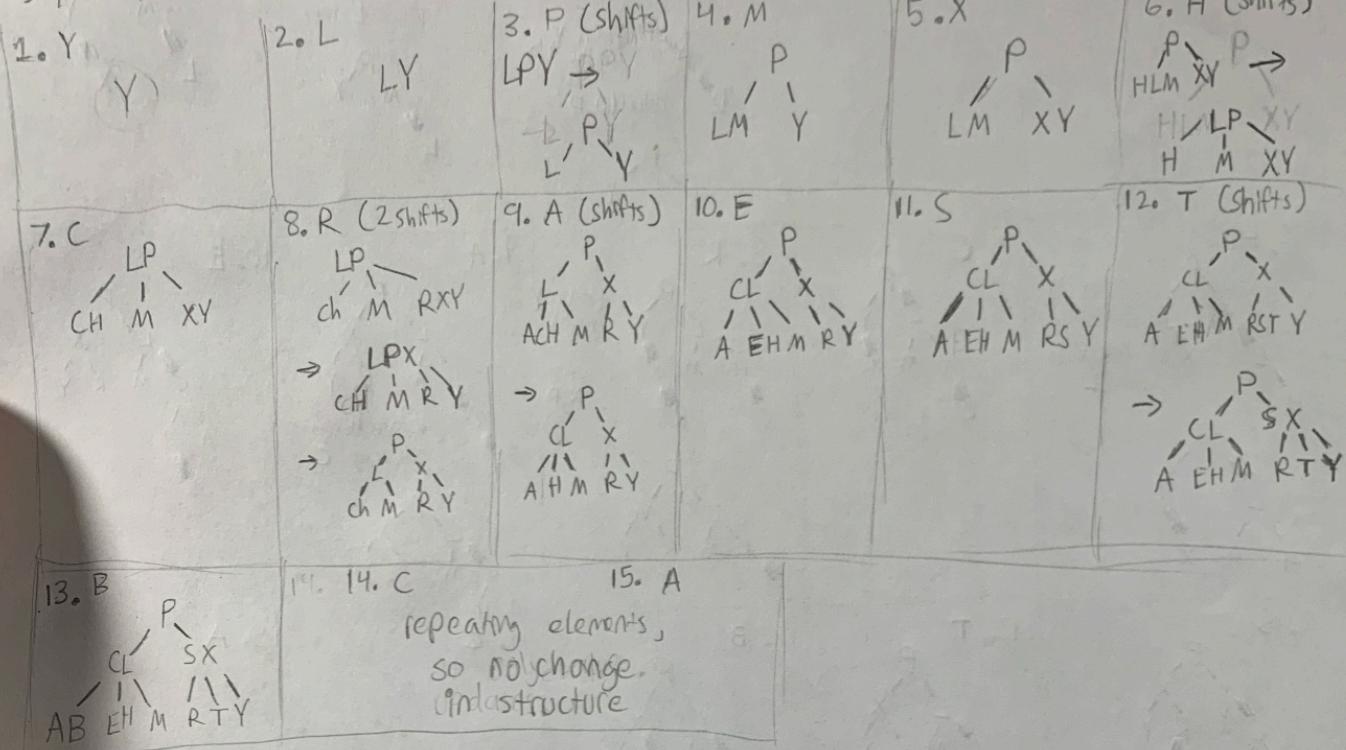


Programming assignment 10

1) 2-3 trees

1a) YLP MXHCRAESTBCA



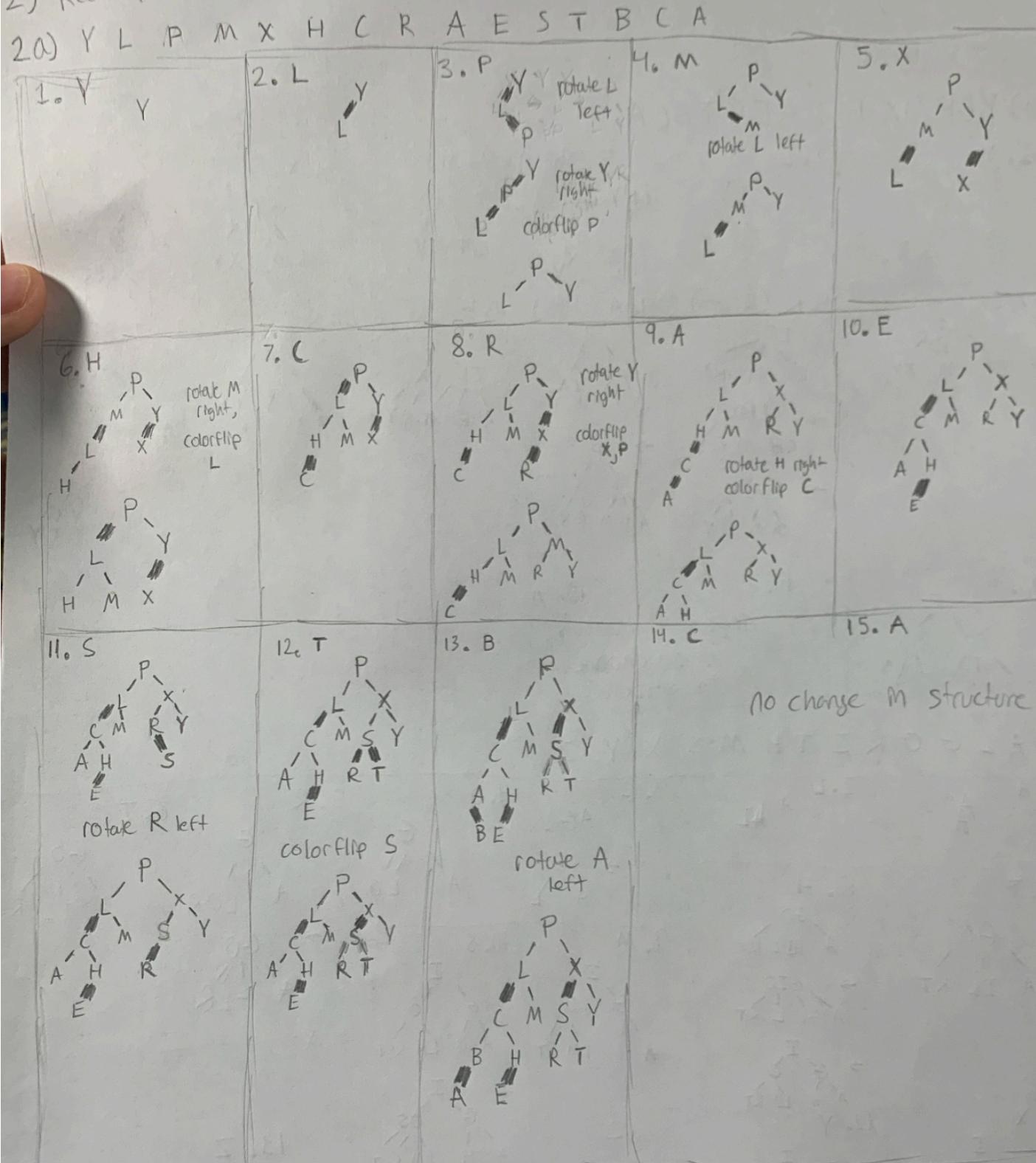
1b) ALGORITHMS XYZ

1.o.A 2.o.L 3.o.G 4.o.O 5.o.R 6.o.I

7.o.T 8.o.H 9.o.M 10.o.S 11.o.X 12.o.Y 13.o.Z

13.o.Z

2) Red black trees

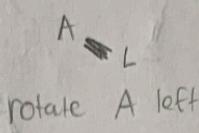


2b) A L G O R I T H M S X Y Z J D

1. A

A

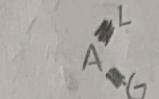
2. L



rotate A left

A

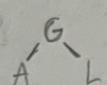
3. G



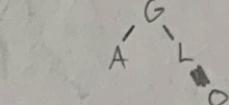
rotate A left

A = G = L

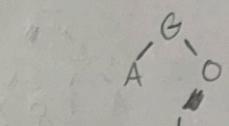
rotate L right
color flip G



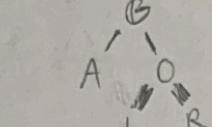
4. O



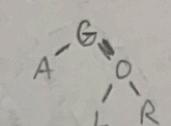
rotate L left



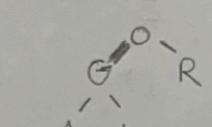
5. R



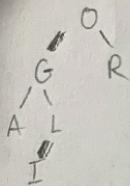
color flip O



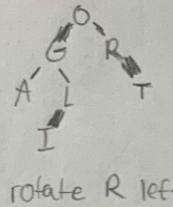
rotate G left



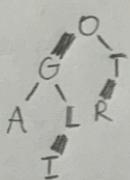
6. I



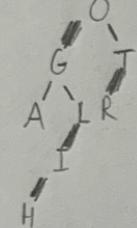
7. T



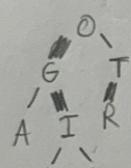
rotate R left



8. H

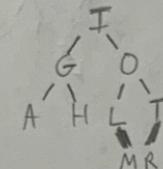


rotate L right
colorflip I

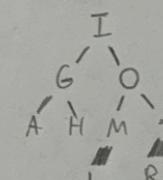


rotate G left

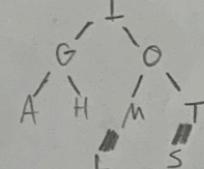
9. M



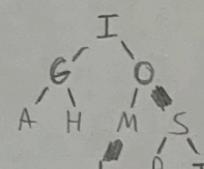
rotate L left



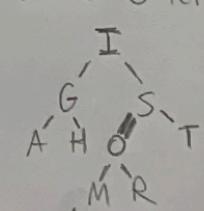
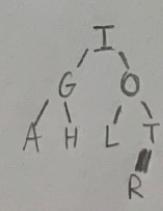
rotate R left

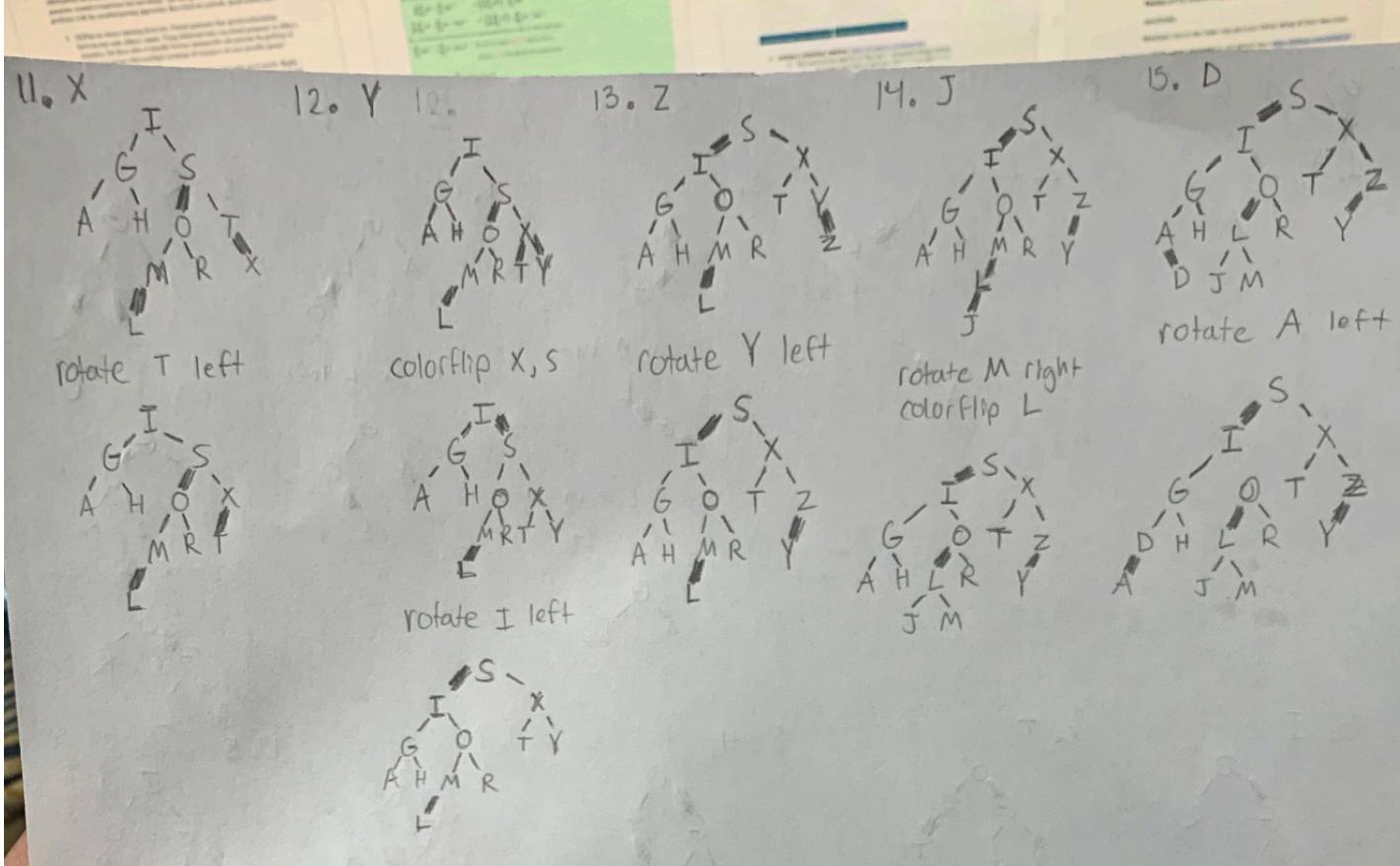


rotate T right
colorflip S

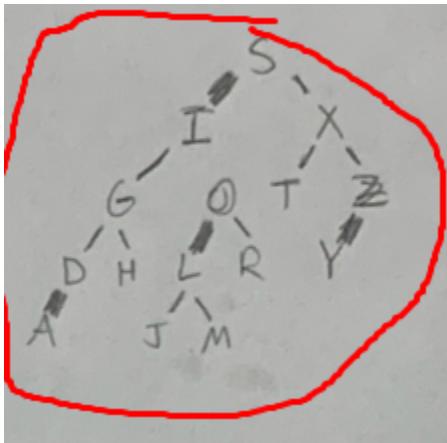


rotate O left





Note to self, answer is bottom right:



Programming output:

