Before split, the Entropy(D) is E = -((1/3) * $\log_2(1/3)$ + (1/5)*$\log_2(1/5)$ + (1/5)*$\log_2(1/5)$ + (2/15)*$\log_2(2/15)$ + (2/15)*$\log_2(2/15)$ + (2/15)*$\log_2(2/15)$) = 0.528 + 0.929 + 0.775 = 2.232

1) if we split on body temperature:
   For warm-blooded, there are 7 animals total, which have 5 mammals, and 2 birds, so the entropy for D_1 = - ((5/7)*$\log_2(5/7)$ + (2/7)*$\log_2(2/7)$) = 0.863
   For cold-blooded, there are 8 animals total, which have 3 reptiles, 3 fishes, and 2 amphibian. So the entropy for D_2 = -((3/8)*$\log_2(3/8)$ + (3/8)*$\log_2(3/8)$ + (1/4)*$\log_2(1/4)$) = 1.561.

   So Gain (body temperature) = 2.232– ((7/15)*0.863 + (8/15)*1.561) = 0.997
   SplitInfo (body temperature) = - ((7/15)*$\log_2(7/15)$ + (8/15)*$\log_2(8/15)$) = 0.997
   GainRatio (body temperature) = Gain (body temperature) / splitInfo (body temperature) = 1.0

2) If we split on skin cover:
   For hair: there are 3 animals total, all of them are mammals,
   So entropy for D_1 = -1 * $\log_2$ 1 = 0.
   For scales: there are 6 animals total, which have 3 reptiles and 3 fish,
   So entropy for D_2 = - ((1/2) * $\log_2(1/2)$ + (1/2)*$\log_2(1/2)$) = 1.
   For none: there are 2 animals total, all of them are amphibian, so entropy for D_3 = 0.
   For feathers: there are 2 animals total, all of them are bird, so entropy for D_4 = 0.
   For fur: there is 1 animal only, so the entropy for D_5 = 0.
   For quill: there is 1 animal only, so the entropy for D_6 = 0.

   So Gain(skin cover) = 2.232 – (6/15)*1 = 1.832
   SplitInfo (skin cover) = -((3/15)*$\log_2(3/15)$ + (6/15)*$\log_2(6/15)$ + (2/15)*$\log_2(2/15)$ + (2/15)*$\log_2(2/15)$ + (1/15)*$\log_2(1/15)$ + (1/15)*$\log_2(1/15)$) = 2.289
   GainRatio(skin cover) = 1.832/2.289 = 0.800

3) If we split on gives birth:
   For yes: there are 6 animals total, which have 5 mammals and 1 fish,
   So the entropy for D_1 = - ((5/6)*$\log_2(5/6)$ + (1/6)*$\log_2(1/6)$) = 0.65.
   For no: there are 9 animals total, which have 3 reptile, 2 fish, 2 amphibian and 2 birds.
   So the entropy for D_2 = - ((3/9)*$\log_2(3/9)$ + (2/9)*$\log_2(2/9)$ + (2/9)*$\log_2(2/9)$ + (2/9)*$\log_2(2/9)$) = 1.975

   So Gain(gives birth) = 2.232 – ((6/15)*0.65 + (9/15)*1.975) = 0.787
   SplitInfo(gives birth) = -((6/15)*$\log_2(6/15)$ + (9/15)*$\log_2(9/15)$) = 0.971
   GainRatio(gives birth) = 0.787 / 0.971 = 0.810
4) If we split on Aquatic Creature:
   For no: there are 7 animals total, which have 4 mammals, 2 reptiles, 1 bird,

So the entropy for D_1 = -((4/7)*$\log_2$(4/7) + (2/7)*$\log_2$(2/7) + (1/7)*$\log_2$(1/7)) = 1.378
For yes: there are 4 animals total, which have 3 fish and 1 mammal,
So the entropy for D_2 = -((3/4)*$\log_2$(3/4) + (1/4)*$\log_2$(1/4)) = 0.811
For semi: there are 4 animals total, which have 2 amphibians, 1 reptile and 1 bird.
So the entropy for D_3 = -((2/4)*$\log_2$(2/4) + (1/4)*$\log_2$(1/4) + (1/4)*$\log_2$(1/4)) = 1.5

So Gain(Aquatic Creature) = 2.232 – ((7/15)*1.378 + (4/15)*0.811 + (4/15)*1.5) = 0.973
SplitInfo (Aquatic Creature) = -((7/15)*$\log_2$(7/15) + (4/15)*$\log_2$(4/15) + (4/15)*$\log_2$(4/15)) = 1.53
GainRatio(Aquatic Creature) = 0.973/1.53 = 0.636

5) If we split on Aerial Creature:
For yes: there are 2 animals total, which have 1 mammal and 1 bird.
So the entropy for D_1 = -((1/2)*$\log_2$(1/2) + (1/2)*$\log_2$(1/2)) = 1
For no: there are 13 animals total, which have 4 mammals, 3 reptiles, 2 fish, 2 amphibians, and 2 reptiles,
So the entropy for D_2 = -((4/13)*$\log_2$(4/13) + (3/13)*$\log_2$(3/13) + (2/13)*$\log_2$(2/13) + (2/13)*$\log_2$(2/13) + (2/13)*$\log_2$(2/13)) = 2.257

So Gain(Aerial Creature) = 2.232 – ((2/15)*1 + (13/15)*2.257) = 0.143
SplitInfo(Aerial Creature) = -((2/15)*$\log_2$(2/15) + (13/15)*$\log_2$(13/15)) = 0.567
GainRatio(Aerial Creature) = 0.143 / 0.567 = 0.252

6) If we split on has legs:
For yes: there are 10 animals, which have 4 mammals, 2 amphibians, 2 reptiles and 2 birds,
So the entropy for D_1 = -((4/10)*$\log_2$(4/10) + (2/10)*$\log_2$(2/10) + (2/10)*$\log_2$(2/10) + (2/10)*$\log_2$(2/10)) = 1.922
For no: there are 5 animals total, which have 1 reptile, 3 fish and 1 mammal,
So the entropy for D_2 = -((1/5)*$\log_2$(1/5) + (3/5)*$\log_2$(3/5) + (1/5)*$\log_2$(1/5)) = 1.371

So Gain(has legs) = 2.232 – ((10/15)*1.922 + (5/15)*1.371) = 0.495
SplitInfo(has legs) = -((10/15)*$\log_2$(10/15) + (5/15)*$\log_2$(5/15)) = 0.918
GainRatio(has legs) = 0.495/0.918 = 0.539

7) If we split on Hibernates:
For yes: there are 5 animals total, which have 1 reptile, 2 amphibians, 2 mammals.
So the entropy for D_1 = -((1/5)*$\log_2$(1/5) + (2/5)*$\log_2$(2/5) + (2/5)*$\log_2$(2/5)) = 1.522
For no: there are 10 animals total, which have 3 mammals, 3 fish, 2 reptiles, and 2 birds.
So the entropy for D_2 = -((3/10)*$\log_2$(3/10) + (3/10)*$\log_2$(3/10) + (2/10)*$\log_2$(2/10) + (2/10)*$\log_2$(2/10)) = 1.971

So Gain(Hibernates) = 2.232 – ((5/15)*1.522 + (10/15)*1.971) = 0.411
SplitInfo(Hibernates) = -((5/15)*$\log_2$(5/15) + (10/15)*$\log_2$(10/15)) = 0.918
GainRatio(Hibernates) = 0.411/0.918 = 0.448

So we will split on Body Temperature.