N = 20

$$-\left(\frac{12}{20}\log_2\frac{12}{20}+\frac{8}{20}\log_2\frac{8}{20}\right)=0'971$$

$H = 0'971$

Color

$$0'971-\left(\frac{10}{20}\cdot H(6^+4^-)+\frac{10}{20}\cdot H(6^+4^-)\right)$$

$Ic = 0'971 - 0'971 = 0$

Size

$$Ig = 0'971-\left(\frac{10}{20}\cdot H(6^+4^-)+\frac{10}{20}\left(H(6^+4^-)\right)=\right.$$

$Ic = 0$

Act

$$Ig = 0'971-\left(\frac{8}{20}\cdot H(8^+0^-)+\frac{12}{20}H(4^+8^-)\right.$$

$Ig = 0'42002$

Age

$$Ig = 0'971-\left(\frac{8}{20}\cdot H(8^+0^-)+\frac{12}{20}(4^+8^-)=\right.$$

$Ic = 0'42002$

Act

$H(4^+8^-) = 0{,}918$

Color

$I_G = 0{,}918 - \left(\frac{6}{12} \cdot H(2^+4^-) + \frac{6}{12} \cdot H(2^+4^-)\right)$

$I_G = 0$

Size

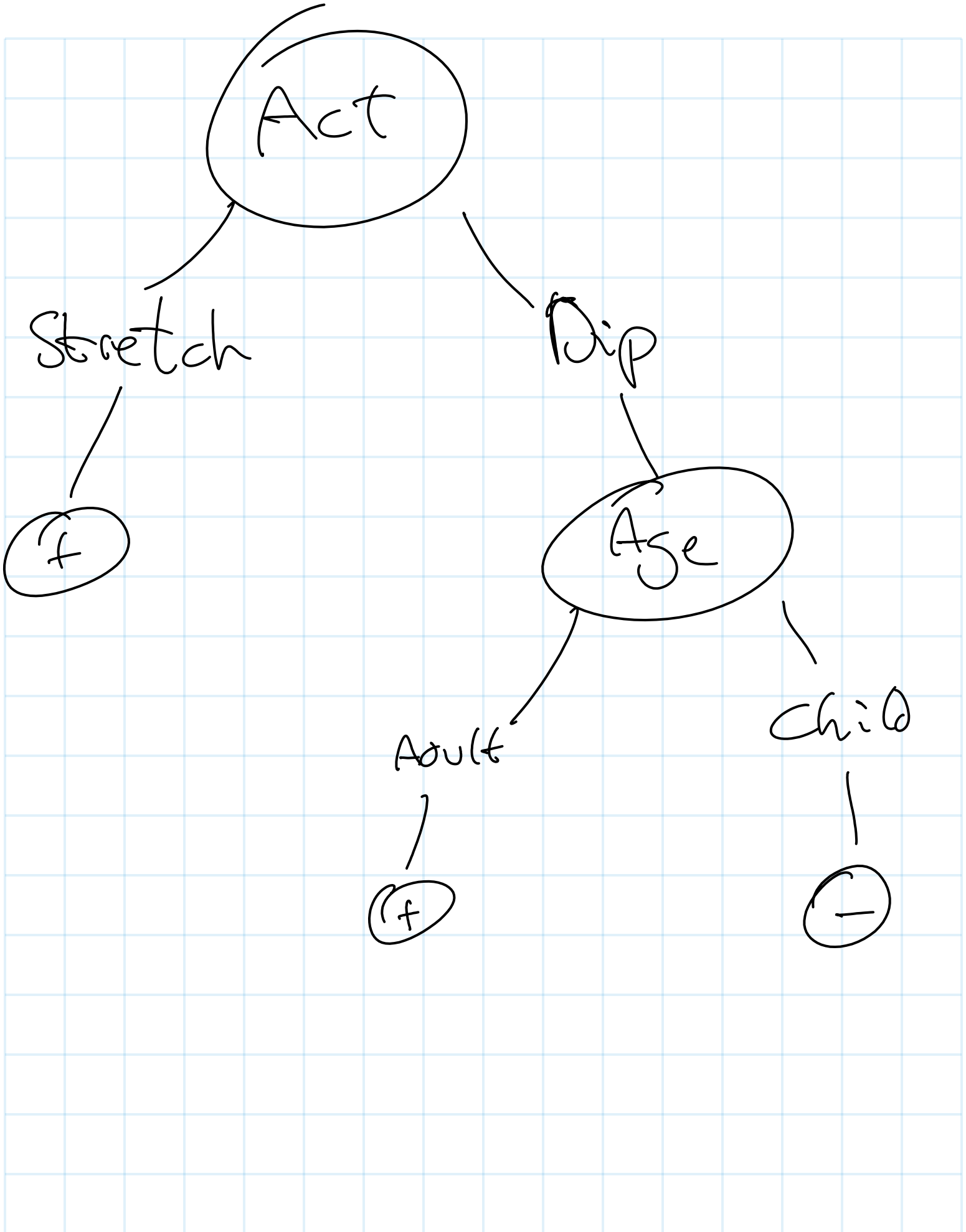
$I_G = 0{,}918 - \left(\frac{6}{12} \cdot H(2^+4^-) + \frac{6}{12} \cdot H(2^+4^-)\right)$

$I_G = 0$

Age

$I_G = 0{,}918 - \left(\frac{4}{12} \cdot H(4^+0^-) + \frac{8}{12} \cdot H(0^+8^-)\right)$

$I_G = 0{,}918$


Act
Stretch
Dip
f
Age
Adult
Child
f
—

Ejercicio 3:

Consideremos los datos de entrenamiento que se dan a continuación para predecir el sexo de una persona (*Sexo* es el atributo objetivo). Utilice el algoritmo ID3 para obtener un árbol de decisión. ¿Cuál es la clase predicha para la muestra de prueba (*Long, High, Young*)?

Person	Hair length	Weight	Age	Class
1	Short	High	Young	Male
2	Long	Low	Young	Female
3	Short	Low	Young	Male
4	Long	Low	Young	Female
5	Short	Low	Young	Female
6	Short	High	Old	Male
7	Long	Low	Old	Female
8	Long	High	Young	Male
9	Long	High	Old	Male

$H(S^+ 4^-) = 0'99107$

Hair length

$IG = H - \left(\frac{4}{9} \cdot H(3^+ 1^-) + \frac{5}{9} \cdot H(2^+ 3^-)\right) =$

$IG = 0'09117$

Weight

$IG = H - \left(\frac{4}{9} \cdot H(4^+ 0^-) + \frac{5}{9} \cdot H(1^+ 4^-)\right| <$

$IG = 0'5900$

Age

$IG = 0'0018$

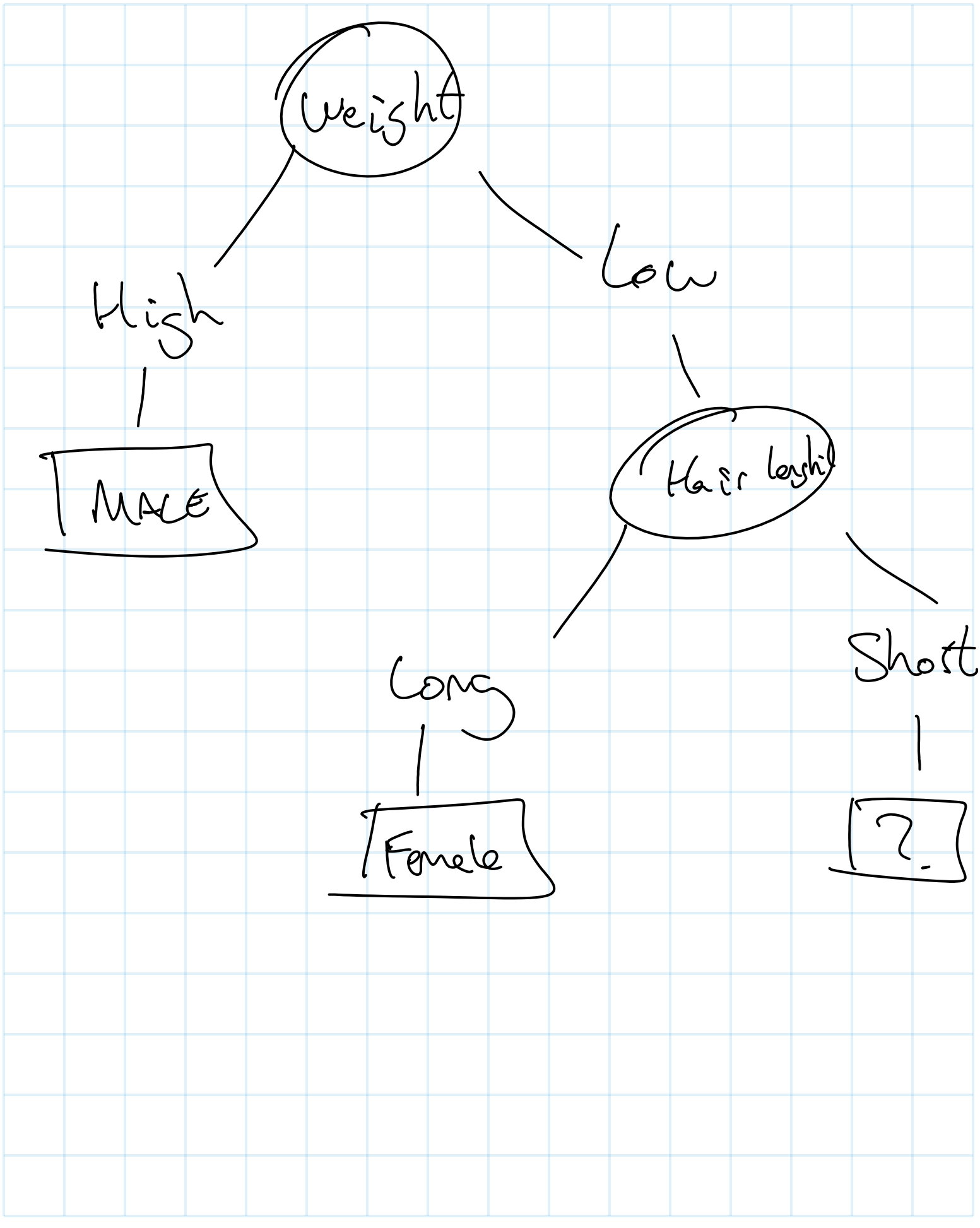
$H(\text{low}) = 0{,}722$

Hair height

$IG = H - \left(\frac{3}{5} \cdot H(0^+ 3^-) + \frac{2}{5} \cdot H(1^+ 1^-)\right) = 0{,}322$

Age

$IG = 0{,}1$


Weight
High
Low
MALE
Hair length
Long
Short
Female
?