Gradient Boosting Example

With explanations of each step.

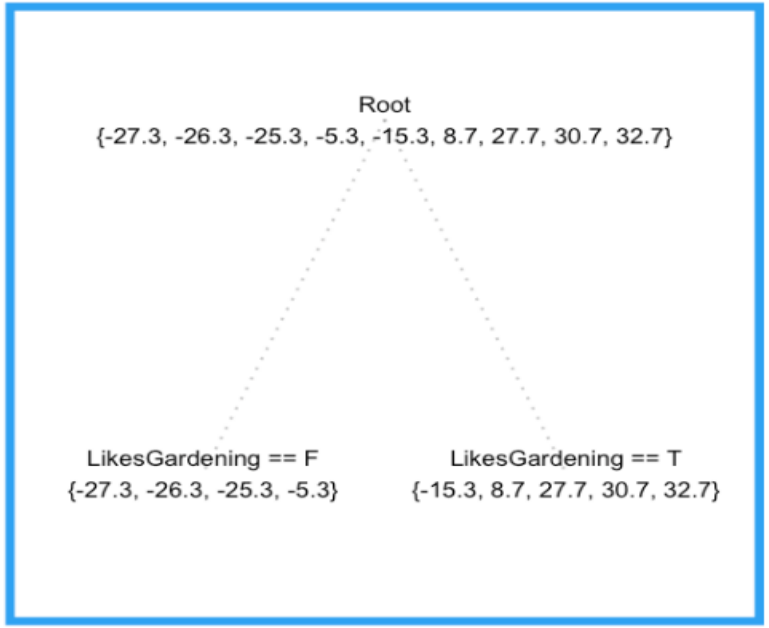
Squared Error

Squared Error

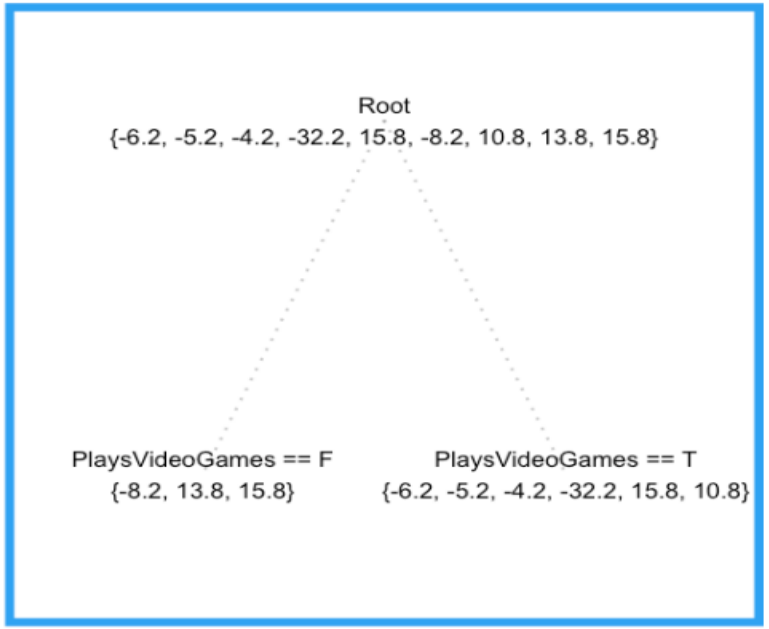
Age	F0	PseudoResidual0	h0	gamma0	F1	PseudoResidual1	h1	gamma1	F2
13	40.33	-27.33	-21.08	1	19.25	-6.25	-3.567	1	15.68
14	40.33	-26.33	-21.08	1	19.25	-5.25	-3.567	1	15.68
15	40.33	-25.33	-21.08	1	19.25	-4.25	-3.567	1	15.68
25	40.33	-15.33	16.87	1	57.2	-32.2	-3.567	1	53.63
35	40.33	-5.333	-21.08	1	19.25	15.75	-3.567	1	15.68
49	40.33	8.667	16.87	1	57.2	-8.2	7.133	1	64.33
68	40.33	27.67	16.87	1	57.2	10.8	-3.567	1	53.63
71	40.33	30.67	16.87	1	57.2	13.8	7.133	1	64.33
73	40.33	32.67	16.87	1	57.2	15.8	7.133	1	64.33

1. Age: initial age of each participant.
2. F0: mean of all ages in the root.
3. PseudoResidual0 = Age – F0.
4. ho = mean of all ages in each leaf.
5. gamma0 = 1. (By default not used)
6. F1 = F0 + h0
7. PseudoResidual1 = PseudoResidual0 - h0
8. h1 = mean of all ages in each leaf.
9. gamma1 = 1. (By default not used)
10. F2 = F1 + h1

h0



h1



Absolute Error

Age	F0	PseudoResidual0	h0	gamma0	F1	PseudoResidual1	h1	gamma1	F2
13	35	-1	-1	20.5	14.5	-1	-0.3333	0.75	14.25
14	35	-1	-1	20.5	14.5	-1	-0.3333	0.75	14.25
15	35	-1	-1	20.5	14.5	1	-0.3333	0.75	14.25
25	35	-1	0.6	55	68	-1	-0.3333	0.75	67.75
35	35	-1	-1	20.5	14.5	1	-0.3333	0.75	14.25
49	35	1	0.6	55	68	-1	0.3333	9	71
68	35	1	0.6	55	68	-1	-0.3333	0.75	67.75
71	35	1	0.6	55	68	1	0.3333	9	71
73	35	1	0.6	55	68	1	0.3333	9	71

1. Age: initial age of each participant.
2. F0: median of all ages in the root.
3. PseudoResidual0 = sign(Age – F0)*1. (note: if Age – F0 = 0 then the default is -1)
4. ho = mean of all residuals in each leaf. (note there is an error here. The left leaf is {-1,-1,-1,-1} and the right leaf is {-1,1,1,1,1})
5. gamma0 = Median (Age – F0)/h0.
6. F1 = F0 + (ho*gamma0)
7. PseudoResidual1 = sign(Age – F1)*1. (note: if Age – F1 = 0 then the default is -1)
8. h1 = mean of all residuals in each leaf.
9. gamma1 = Median (Age – F1)/h1.
10. F2 = F1 + (h1*gamma1)