



UANL

UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN



FIME

FACULTAD DE INGENIERÍA MECÁNICA Y ELÉCTRICA

Universidad Autónoma de Nuevo León

Facultad de Ingeniería Mecánica
y Eléctrica

Trabajo hecho en clase

Grados de pertenencia con Pokémon ✨

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Funciones de pertenencia Sat Izq y Der

Núcleo: lo que es 1
 Soporte: Todo lo que
 frontera:

Hay 2 saturaciones. Izquierda, derecha

$$f(x) \begin{cases} x \leq \alpha \rightarrow 0 \\ \alpha \leq x \leq \beta \rightarrow \frac{x-\alpha}{\beta-\alpha} \\ x \geq \beta \rightarrow 1 \end{cases}$$

$$f(x) \begin{cases} x \leq \alpha \rightarrow \frac{x-\alpha}{\beta-\alpha} \\ \alpha \leq x \leq \beta \rightarrow \frac{\beta-x}{\beta-\alpha} \\ x \geq \beta \rightarrow 0 \end{cases}$$

Ataque

$$\begin{cases} \text{min: } 10 \text{ (magistral)} \\ \text{max: } 160 \text{ (polafin)} \end{cases} \begin{cases} x_{\min} 10 \\ x_{\max} 160 \end{cases} \begin{matrix} 0 \\ 1 \end{matrix}$$

Saturación Derecha
 el 1 está hacia el máximo

$$\begin{cases} m = \frac{1-0}{x_{\max}-x_{\min}} \end{cases}$$

• $b = -m(x_{\min})$

• $y = \frac{1}{x_{\max}-x_{\min}}(x) - \frac{x_{\min}}{x_{\max}-x_{\min}}$

Def

$$\begin{cases} \text{min: } 30 \text{ (Gastly)} \\ \text{max: } 200 \text{ (Steelix)} \end{cases} \begin{cases} x_{\min} 30 \\ x_{\max} 200 \end{cases} \begin{matrix} 1 \\ 0 \end{matrix}$$

Saturación Izquierda
 el 1 es al mínimo

$$\begin{cases} m = \frac{0-1}{x_{\max}-x_{\min}} \end{cases}$$

• $b = m(x_{\max})$

• $y = \frac{-1}{x_{\max}-x_{\min}}(x) + \frac{x_{\max}}{x_{\max}-x_{\min}}$

Por ejemplo

Saturación A

la y de $\begin{cases} \text{min } 10 \\ \text{max } 160 \end{cases}$

$$y = \frac{1}{160-10}(x) - \frac{10}{160-10}$$

$$y = \frac{x}{150} - \frac{10}{150}$$

$$y = \frac{x}{150} - \frac{1}{15}$$

y cuando nos den "sacar x
 reemplazas x por el valor al que

Por ejemplo 80: $\frac{80}{150} - \frac{1}{15} = \frac{7}{15}$

50

Saturación B

la y de $\begin{cases} \text{min } 30 \\ \text{max } 200 \end{cases}$

$$y = \frac{-1}{200-30}(x) + \frac{200}{200-30}$$

$$y = \frac{-x}{170} + \frac{20}{17}$$

Sat Triangular

Saturación Derecha

• $X_{min} \longrightarrow 0$

• $\frac{X_{min} + X_{max}}{2} \longrightarrow 1$

$$\left\{ m = \frac{2}{X_{max} - X_{min}} \right\}$$

$$\left\{ b = \frac{-2X_{min}}{X_{max} - X_{min}} \right\}$$

$$\left\{ y = \frac{2}{X_{max} - X_{min}} X - \frac{2X_{min}}{X_{max} - X_{min}} \right\}$$

Saturación Izquierda

• $\frac{X_{min} + X_{max}}{2} \longrightarrow 1$

• $X_{max} \longrightarrow 0$

$$\left\{ m = \frac{-2}{X_{max} - X_{min}} \right\}$$

$$\left\{ b = \frac{2X_{max}}{X_{max} - X_{min}} \right\}$$

$$\left\{ y = \frac{2X_{max}}{X_{max} - X_{min}} - \frac{2X}{X_{max} - X_{min}} \right\}$$

Por ejemplo:

Sp. Alt: $\begin{cases} X_{min} = 15 \\ X_{max} = 159 \end{cases}$ Promedio: 79.5

Obtener para 60 (Como está por debajo del promedio (87) es saturación derecha)

$$m = \frac{2}{159 - 15} = 144$$

$$b = \frac{-2(15)}{159 - 15} = \frac{5}{24}$$

$$y = \frac{2}{159 - 15} (60) - \frac{2(15)}{159 - 15}$$

$$y = \frac{5}{8} = 0.625$$

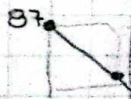


Obtener para 130 (Como está por arriba del promedio (87) es saturación izquierda)

$$m = \frac{-2}{159 - 15} = -144$$

$$b = \frac{2(159)}{159 - 15} = \frac{53}{24}$$

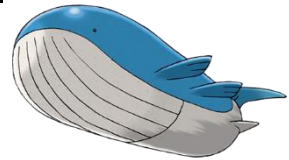
$$y = \frac{2(159)}{(159 - 15)} - \frac{2(130)}{(159 - 15)} = \frac{29}{72} = 0.402$$



Or	Nombre	HP	Atk	Def	Vel	SpeAtk	SpeDef
1	squirtle	44	48	65	43	50	64
2	wartortle	59	63	80	58	65	80
3	blastoise	79	83	100	78	85	105
4	psyduck	50	52	48	55	65	50
5	golduck	80	82	78	85	95	80
6	poliwag	40	50	40	90	40	40
7	poliwhirl	65	65	65	90	50	50
8	poliwrath	90	95	95	70	70	90
9	tentacool	40	40	35	70	50	100
10	tentacruel	80	70	65	100	80	120
11	slowpoke	90	65	65	15	40	40
12	slowbro	95	75	110	30	100	80
13	seel	65	45	55	45	45	70
14	dewgong	90	70	80	70	70	95
15	shellder	30	65	100	40	45	25
16	cloyster	50	95	180	70	85	45
17	krabby	30	105	90	50	25	25
18	kingler	55	130	115	75	50	50
19	horsea	30	40	70	60	70	25
20	seadra	55	65	95	85	95	45
21	goldeen	45	67	60	63	35	50
22	seaking	80	92	65	68	65	80
23	staryu	30	45	55	85	70	55
24	starmie	60	75	85	115	100	85
25	magikarp	20	10	55	80	15	20
26	gyarados	95	125	79	81	60	100
27	lapras	130	85	80	60	85	95
28	vaporeon	130	65	60	65	110	95
29	omanyte	35	40	100	35	90	55
30	omastar	70	60	125	55	115	70
31	kabuto	30	80	90	55	55	45
32	kabutops	60	115	105	80	65	70
33	totodile	50	65	64	43	44	48
34	croconaw	65	80	80	58	59	63
35	feraligatr	85	105	100	78	79	83
36	chinchou	75	38	38	67	56	56

Mayor HP:

Wailord



HP: 170

Mayor Ataque:

Palafin (Heróico)



Atk: 160

Mayor Defensa:

Cloyster



Def: 180

Mayor Velocidad:

Ferrosaco



37	lanturn	125	58	58	67	76	76
38	marill	70	20	50	40	20	50
39	azumarill	100	50	80	50	60	80
40	politoed	90	75	75	70	90	100
41	wooper	55	45	45	15	25	25
42	quagsire	95	85	85	35	65	65
43	slowking	95	75	80	30	100	110
44	qwilfish	65	95	85	85	55	55
45	corsola	65	55	95	35	65	95
46	remoraid	35	65	35	65	65	35
47	octillery	75	105	75	45	105	75
48	mantine	85	40	70	70	80	140
49	kingdra	75	95	95	85	95	95
50	suicune	100	75	115	85	90	115
51	mudkip	50	70	50	40	50	50
52	marshomp	70	85	70	50	60	70
53	swampert	100	110	90	60	85	90
54	lotad	40	30	30	30	40	50
55	lombre	60	50	50	50	60	70
56	ludicolo	80	70	70	70	90	100
57	wingull	40	30	30	85	55	30
58	pelipper	60	50	100	65	95	70
59	surskit	40	30	32	65	50	52
60	carvanha	45	90	20	65	65	20
61	sharpedo	70	120	40	95	95	40
62	wailmer	130	70	35	60	70	35
63	wailord	170	90	45	60	90	45
64	barboach	50	48	43	60	46	41
65	whiscash	110	78	73	60	76	71
66	corphish	43	80	65	35	50	35
67	crawdaunt	63	120	85	55	90	55
68	feebas	20	15	20	80	10	55
69	milotic	95	60	79	81	100	125
70	spheal	70	40	50	25	55	50
71	sealeo	90	60	70	45	75	70
72	walrein	110	80	90	65	95	90
73	clamperl	35	64	85	32	74	55
74	huntail	55	104	105	52	94	75
75	gorebyss	55	84	105	52	114	75

Spe: 136

Mayor Ataque Especial:
Kyogre (Primigenio)



SpAtk: 180

Mayor Defensa Especial:
Kyogre (Primigenio)



SpDef: 160

76	relicanth	100	90	130	55	45	65
77	luvdisc	43	30	55	97	40	65
78	kyogre	100	100	90	90	150	140
79	piplup	53	51	53	40	61	56
80	prinplup	64	66	68	50	81	76
81	empoleon	84	86	88	60	111	101
82	bibarel	79	85	60	71	55	60
83	buizel	55	65	35	85	60	30
84	floatzel	85	105	55	115	85	50
85	shellos	76	48	48	34	57	62
86	gastrodon	111	83	68	39	92	82
87	finneon	49	49	56	66	49	61
88	lumineon	69	69	76	91	69	86
89	mantyke	45	20	50	50	60	120
90	palkia	90	120	100	100	150	120
91	phione	80	80	80	80	80	80
92	manaphy	100	100	100	100	100	100
93	oshawott	55	55	45	45	63	45
94	dewott	75	75	60	60	83	60
95	samurott	95	100	85	70	108	70
96	panpour	50	53	48	64	53	48
97	simipour	75	98	63	101	98	63
98	tympole	50	50	40	64	50	40
99	palpitoad	75	65	55	69	65	55
100	seismitoad	105	95	75	74	85	75
101	basculin-red-striped	70	92	65	98	80	55
102	tirtouga	54	78	103	22	53	45
103	carracosta	74	108	133	32	83	65
104	ducklett	62	44	50	55	44	50
105	swanna	75	87	63	98	87	63
106	frillish	55	40	50	40	65	85
107	jellicent	100	60	70	60	85	105
108	alomomola	165	75	80	65	40	45
109	keldeo-ordinary	91	72	90	108	129	90
110	froakie	41	56	40	71	62	44
111	frogadier	54	63	52	97	83	56
112	greninja	72	95	67	122	103	71
113	binacle	42	52	67	50	39	56
114	barbaracle	72	105	115	68	54	86
115	skrelp	50	60	60	30	60	60
116	clauncher	50	53	62	44	58	63

117	clawitzer	71	73	88	59	120	89
118	volcanion	80	110	120	70	130	90
119	popplio	50	54	54	40	66	56
120	brionne	60	69	69	50	91	81
121	primarina	80	74	74	60	126	116
122	wishiwashi-solo	45	20	20	40	25	25
123	mareanie	50	53	62	45	43	52
124	toxapex	50	63	152	35	53	142
125	dewpider	38	40	52	27	40	72
126	araquanid	68	70	92	42	50	132
127	wimpod	25	35	40	80	20	30
128	golisopod	75	125	140	40	60	90
129	pyukumuku	55	60	130	5	30	130
130	bruxish	68	105	70	92	70	70
131	tapu-fini	70	75	115	85	95	130
132	sobble	50	40	40	70	70	40
133	drizzile	65	60	55	90	95	55
134	inteleon	70	85	65	120	125	65
135	chewtle	50	64	50	44	38	38
136	drednaw	90	115	90	74	48	68
137	cramorant	70	85	55	85	85	95
138	arrokuda	41	63	40	66	40	30
139	barraskewda	61	123	60	136	60	50
140	dracovish	90	90	100	75	70	80
141	arctovish	90	90	100	55	80	90
142	basculion-male	120	112	65	78	80	75
143	quaxly	55	65	45	50	50	45
144	quaxwell	70	85	65	65	65	60
145	quaquaval	85	120	80	85	85	75
146	wiglett	10	55	25	95	35	25
147	wugtrio	35	100	50	120	50	70
148	finizen	70	45	40	75	45	40
149	palafin	100	70	72	100	53	62
150	veluza	90	102	73	70	78	65
151	dondozo	150	100	115	35	65	65
152	tatsugiri	68	50	60	82	120	95
153	iron-bundle	56	80	114	136	124	60
154	walking-wake	99	83	91	109	125	83
155	rotom-wash	50	65	107	86	105	107
156	castform-rainy	70	70	70	70	70	70
157	basculin-blue-striped	70	92	65	98	80	55

158	keldeo-resolute	91	72	90	108	129	90
159	blastoise-mega	79	103	120	78	135	115
160	gyarados-mega	95	155	109	81	70	130
161	swampert-mega	100	150	110	70	95	110
162	sharpedo-mega	70	140	70	105	110	65
163	slowbro-mega	95	75	180	30	130	80
164	kyogre-primal	100	150	90	90	180	160
165	greninja-battle-bond	72	95	67	122	103	71
166	greninja-ash	72	145	67	132	153	71
167	wishiwashi-school	45	140	130	30	140	135
168	araquanid-totem	68	70	92	42	50	132
169	cramorant-gulping	70	85	55	85	85	95
170	cramorant-gorging	70	85	55	85	85	95
171	urshifu-rapid-strike	100	130	100	97	63	60
172	blastoise-gmax	79	83	100	78	85	105
173	kingler-gmax	55	130	115	75	50	50
174	lapras-gmax	130	85	80	60	85	95
175	inteleon-gmax	70	85	65	120	125	65
176	drednaw-gmax	90	115	90	74	48	68
177	urshifu-rapid-strike-gmax	100	130	100	97	63	60
178	samurott-hisui	90	108	80	85	100	65
179	palkia-origin	90	100	100	120	150	120
180	basculin-white-striped	70	92	65	98	80	55
181	basculion-female	120	92	65	78	100	75
182	tauros-paldea-aqua-breed	75	110	105	100	30	70
183	palafin-hero	100	160	97	100	106	87
184	tatsugiri-droopy	68	50	60	82	120	95
185	tatsugiri-stretchy	68	50	60	82	120	95
186	ogerpon-wellspring-mask	80	120	84	110	60	96

Or	Nombre	HP	Atk	Def	Vel	SpAt	SpDf
1	bulbasaur	45	49	49	45	65	65
2	ivysaur	60	62	63	60	80	80
3	venusaur	80	82	83	80	100	100
4	weedle	40	35	30	50	20	20
5	kakuna	45	25	50	35	25	25
6	beedrill	65	90	40	75	45	80
7	ekans	35	60	44	55	40	54
8	arbok	60	95	69	80	65	79
9	nidoran-f	55	47	52	41	40	40
10	nidorina	70	62	67	56	55	55
11	nidoqueen	90	92	87	76	75	85
12	nidoran-m	46	57	40	50	40	40
13	nidorino	61	72	57	65	55	55
14	nidoking	81	102	77	85	85	75
15	zubat	40	45	35	55	30	40
16	golbat	75	80	70	90	65	75
17	oddish	45	50	55	30	75	65
18	gloom	60	65	70	40	85	75
19	vileplume	75	80	85	50	110	90
20	venonat	60	55	50	45	40	55
21	venomoth	70	65	60	90	90	75
22	bellsprout	50	75	35	40	70	30
23	weepinbell	65	90	50	55	85	45
24	victreebel	80	105	65	70	100	70
25	tentacool	40	40	35	70	50	100
26	tentacruel	80	70	65	100	80	120
27	grimer	80	80	50	25	40	50
28	muk	105	105	75	50	65	100
29	gastly	30	35	30	80	100	35
30	haunter	45	50	45	95	115	55
31	gengar	60	65	60	110	130	75
32	koffing	40	65	95	35	60	45
33	weezing	65	90	120	60	85	70
34	spinarak	40	60	40	30	40	40
35	ariados	70	90	70	40	60	70
36	crobat	85	90	80	130	70	80

Mayor HP:

Eternatus Eternamax



HP: 255

Mayor Defensa:

Eternatus Eternamax



Def: 250

Mayor Ataque:

Mega-Bedrill



Atk: 150

Mayor Velocidad:

Mega-Bedrill



37	qwilfish	65	95	85	85	55	55
38	dustox	60	50	70	65	50	90
39	roselia	50	60	45	65	100	80
40	gulpin	70	43	53	40	43	53
41	swalot	100	73	83	55	73	83
42	seviper	73	100	60	65	100	60
43	budew	40	30	35	55	50	70
44	roserade	60	70	65	90	125	105
45	stunky	63	63	47	74	41	41
46	skuntank	103	93	67	84	71	61
47	skorupi	40	50	90	65	30	55
48	drapion	70	90	110	95	60	75
49	croagunk	48	61	40	50	61	40
50	toxicroak	83	106	65	85	86	65
51	venipede	30	45	59	57	30	39
52	whirlipede	40	55	99	47	40	79
53	scolipede	60	100	89	112	55	69
54	trubbish	50	50	62	65	40	62
55	garbodor	80	95	82	75	60	82
56	foongus	69	55	45	15	55	55
57	amoonguss	114	85	70	30	85	80
58	skrelp	50	60	60	30	60	60
59	dragalge	65	75	90	44	97	123
60	mareanie	50	53	62	45	43	52
61	toxapex	50	63	152	35	53	142
62	salandit	48	44	40	77	71	40
63	salazzle	68	64	60	117	111	60
64	nihilego	109	53	47	103	127	131
65	poipole	67	73	67	73	73	67
66	naganadel	73	73	73	121	127	73
67	toxetel	40	38	35	40	54	35
68	toxtricity-amped	75	98	70	75	114	70
69	eternatus	140	85	95	130	145	95
70	sneasler	80	130	60	120	40	80
71	overqwil	85	115	95	85	65	65
72	shroodle	40	65	35	75	40	35
73	grafaiai	63	95	65	110	80	72
74	varoom	45	70	63	47	30	45
75	revavroom	80	119	90	90	54	67

Speed: 141

Mayor Ataque.Especial
Mega-Gengar



Sp.Atk: 170

Mayor Defensa Especial:
Eternatus Eternamax



SpDef: 250

76	glimmet	48	35	42	60	105	60
77	glimmora	83	55	90	86	130	81
78	clodsire	130	75	60	20	45	100
79	iron-moth	80	70	60	110	140	110
80	okidogi	88	128	115	80	58	86
81	munkidori	88	75	66	106	130	90
82	fezandipiti	88	91	82	99	70	125
83	pecharunt	88	88	160	88	88	88
84	venusaur-mega	80	100	123	80	122	120
85	gengar-mega	60	65	80	130	170	95
86	beedrill-mega	65	150	40	145	15	80
87	grimer-alola	80	80	50	25	40	50
88	muk-alola	105	105	75	50	65	100
89	salazzle-totem	68	64	60	117	111	60
90	slowbro-galar	95	100	95	30	100	70
91	weezing-galar	65	90	120	60	85	70
92	slowking-galar	95	65	80	30	110	110
93	toxtricity-low-key	75	98	70	75	114	70
94	eternatus-eternamax	255	115	250	130	125	250
95	venusaur-gmax	80	82	83	80	100	100
96	gengar-gmax	60	65	60	110	130	75
97	garbodor-gmax	80	95	82	75	60	82
98	toxtricity-amped-gmax	75	98	70	75	114	70
99	toxtricity-low-key-gmax	75	98	70	75	114	70
100	qwilfish-hisui	65	95	85	85	55	55
101	sneasel-hisui	55	95	55	115	35	75
102	wooper-paldea	55	45	45	15	25	25