

## CASESTUDY ON POKEMON USING R PROGRAM

```
> getwd()
[1] "C:/Users/Admin/Documents"
> #setwd("C:\\Users\\Admin\\Desktop\\pokemon")
> setwd("C:\\Users\\Admin\\Desktop\\pokemon")
> getwd()
[1] "C:/Users/Admin/Desktop/pokemon"
> data=read.csv("Pokemon.csv")
> data
```

X.		Name	Type.1	Type.2	Total	HP	Attack	Defense	Sp..Atk
1	1	Bulbasaur	Grass	Poison	318	45	49	49	65
2	2	Ivysaur	Grass	Poison	405	60	62	63	80
3	3	Venusaur	Grass	Poison	525	80	82	83	100
4	3	VenusaurMega	Venusaur	Grass	Poison	625	80	100	123 122
5	4	Charmander	Fire		309	39	52	43	60
6	5	Charmeleon	Fire		405	58	64	58	80
7	6	Charizard	Fire	Flying	534	78	84	78	109
8	6	CharizardMega	Charizard X	Fire	Dragon	634	78	130	111 130
9	6	CharizardMega	Charizard Y	Fire	Flying	634	78	104	78 159
10	7	Squirtle	Water		314	44	48	65	50
11	8	Wartortle	Water		405	59	63	80	65
12	9	Blastoise	Water		530	79	83	100	85
13	9	BlastoiseMega	Blastoise	Water		630	79	103	120 135
14	10	Caterpie	Bug		195	45	30	35	20
15	11	Metapod	Bug		205	50	20	55	25
16	12	Butterfree	Bug	Flying	395	60	45	50	90
17	13	Weedle	Bug	Poison	195	40	35	30	20
18	14	Kakuna	Bug	Poison	205	45	25	50	25

19	15	Beedrill	Bug	Poison	395	65	90	40	45	
20	15	BeedrillMega Beedrill	Bug	Poison	495	65	150	40	15	
21	16	Pidgey	Normal	Flying	251	40	45	40	35	
22	17	Pidgeotto	Normal	Flying	349	63	60	55	50	
23	18	Pidgeot	Normal	Flying	479	83	80	75	70	
24	18	PidgeotMega Pidgeot	Normal	Flying	579	83	80	80	135	
25	19	Rattata	Normal		253	30	56	35	25	
26	20	Raticate	Normal		413	55	81	60	50	
27	21	Spearow	Normal	Flying	262	40	60	30	31	
28	22	Fearow	Normal	Flying	442	65	90	65	61	
29	23	Ekans	Poison		288	35	60	44	40	
30	24	Arbok	Poison		438	60	85	69	65	
31	25	Pikachu	Electric		320	35	55	40	50	
32	26	Raichu	Electric		485	60	90	55	90	
33	27	Sandshrew	Ground		300	50	75	85	20	
34	28	Sandslash	Ground		450	75	100	110	45	
35	29	Nidoran?	Poison		275	55	47	52	40	
36	30	Nidorina	Poison		365	70	62	67	55	
37	31	Nidoqueen	Poison	Ground	505	90	92	87	75	
38	32	Nidoran?	Poison		273	46	57	40	40	
39	33	Nidorino	Poison		365	61	72	57	55	
40	34	Nidoking	Poison	Ground	505	81	102	77	85	
41	35	Clefairy	Fairy		323	70	45	48	60	
42	36	Clefable	Fairy		483	95	70	73	95	
43	37	Vulpix	Fire		299	38	41	40	50	
44	38	Ninetales	Fire		505	73	76	75	81	
45	39	Jigglypuff	Normal	Fairy	270	115	45	20	45	
46	40	Wigglytuff	Normal	Fairy	435	140	70	45	85	
47	41	Zubat	Poison	Flying	245	40	45	35	30	
48	42	Golbat	Poison	Flying	455	75	80	70	65	
49	43	Oddish	Grass	Poison	320	45	50	55	75	

50	44	Gloom	Grass	Poison	395	60	65	70	85	
51	45	Vileplume	Grass	Poison	490	75	80	85	110	
52	46	Paras	Bug	Grass	285	35	70	55	45	
53	47	Parasect	Bug	Grass	405	60	95	80	60	
54	48	Venonat	Bug	Poison	305	60	55	50	40	
55	49	Venomoth	Bug	Poison	450	70	65	60	90	
56	50	Diglett	Ground		265	10	55	25	35	
57	51	Dugtrio	Ground		405	35	80	50	50	
58	52	Meowth	Normal		290	40	45	35	40	
59	53	Persian	Normal		440	65	70	60	65	
60	54	Psyduck	Water		320	50	52	48	65	
61	55	Golduck	Water		500	80	82	78	95	
62	56	Mankey	Fighting		305	40	80	35	35	
63	57	Primeape	Fighting		455	65	105	60	60	
64	58	Growlithe	Fire		350	55	70	45	70	
65	59	Arcanine	Fire		555	90	110	80	100	
66	60	Poliwag	Water		300	40	50	40	40	
67	61	Poliwhirl	Water		385	65	65	65	50	
68	62	Poliwrath	Water	Fighting	510	90	95	95	70	
69	63	Abra	Psychic		310	25	20	15	105	
70	64	Kadabra	Psychic		400	40	35	30	120	
71	65	Alakazam	Psychic		500	55	50	45	135	
72	65	AlakazamMega	Alakazam	Psychic		590	55	50	65	175
73	66	Machop	Fighting		305	70	80	50	35	
74	67	Machoke	Fighting		405	80	100	70	50	
75	68	Machamp	Fighting		505	90	130	80	65	
76	69	Bellsprout	Grass	Poison	300	50	75	35	70	

Sp..Def Speed Generation Legendary

1	65	45	1	FALSE
2	80	60	1	FALSE
3	100	80	1	FALSE

4	120	80	1	FALSE
5	50	65	1	FALSE
6	65	80	1	FALSE
7	85	100	1	FALSE
8	85	100	1	FALSE
9	115	100	1	FALSE
10	64	43	1	FALSE
11	80	58	1	FALSE
12	105	78	1	FALSE
13	115	78	1	FALSE
14	20	45	1	FALSE
15	25	30	1	FALSE
16	80	70	1	FALSE
17	20	50	1	FALSE
18	25	35	1	FALSE
19	80	75	1	FALSE
20	80	145	1	FALSE
21	35	56	1	FALSE
22	50	71	1	FALSE
23	70	101	1	FALSE
24	80	121	1	FALSE
25	35	72	1	FALSE
26	70	97	1	FALSE
27	31	70	1	FALSE
28	61	100	1	FALSE
29	54	55	1	FALSE
30	79	80	1	FALSE
31	50	90	1	FALSE
32	80	110	1	FALSE
33	30	40	1	FALSE
34	55	65	1	FALSE

35	40	41	1	FALSE
36	55	56	1	FALSE
37	85	76	1	FALSE
38	40	50	1	FALSE
39	55	65	1	FALSE
40	75	85	1	FALSE
41	65	35	1	FALSE
42	90	60	1	FALSE
43	65	65	1	FALSE
44	100	100	1	FALSE
45	25	20	1	FALSE
46	50	45	1	FALSE
47	40	55	1	FALSE
48	75	90	1	FALSE
49	65	30	1	FALSE
50	75	40	1	FALSE
51	90	50	1	FALSE
52	55	25	1	FALSE
53	80	30	1	FALSE
54	55	45	1	FALSE
55	75	90	1	FALSE
56	45	95	1	FALSE
57	70	120	1	FALSE
58	40	90	1	FALSE
59	65	115	1	FALSE
60	50	55	1	FALSE
61	80	85	1	FALSE
62	45	70	1	FALSE
63	70	95	1	FALSE
64	50	60	1	FALSE
65	80	95	1	FALSE

```

66  40  90    1 FALSE
67  50  90    1 FALSE
68  90  70    1 FALSE
69  55  90    1 FALSE
70  70 105    1 FALSE
71  95 120    1 FALSE
72  95 150    1 FALSE
73  35  35    1 FALSE
74  60  45    1 FALSE
75  85  55    1 FALSE
76  30  40    1 FALSE

```

```
[ reached 'max' /getOption("max.print") -- omitted 724 rows ]
```

```
> Pokemon=data
```

```
> Pokemon
```

X.		Name	Type.1	Type.2	Total	HP	Attack	Defense	Sp..Atk
1	1	Bulbasaur	Grass	Poison	318	45	49	49	65
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16	12	Butterfree	Bug	Flying	395	60	45	50	90

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28	22	Fearow	Normal	Flying	442	65	90	65	61
29	23	Ekans	Poison		288	35	60	44	40
30	24	Arbok	Poison		438	60	85	69	65
31	25	Pikachu	Electric		320	35	55	40	50
32	26	Raichu	Electric		485	60	90	55	90
33	27	Sandshrew	Ground		300	50	75	85	20
34	28	Sandslash	Ground		450	75	100	110	45
35	29	Nidoran?	Poison		275	55	47	52	40
36	30	Nidorina	Poison		365	70	62	67	55
37	31	Nidoqueen	Poison	Ground	505	90	92	87	75
38	32	Nidoran?	Poison		273	46	57	40	40
39	33	Nidorino	Poison		365	61	72	57	55
40	34	Nidoking	Poison	Ground	505	81	102	77	85
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44	38	Ninetales	Fire		505	73	76	75	81
45	39	Jigglypuff	Normal	Fairy	270	115	45	20	45
46	40	Wigglytuff	Normal	Fairy	435	140	70	45	85
47	41	Zubat	Poison	Flying	245	40	45	35	30

48	42	Golbat	Poison	Flying	455	75	80	70	65	
49	43	Oddish	Grass	Poison	320	45	50	55	75	
50	44	Gloom	Grass	Poison	395	60	65	70	85	
51	45	Vileplume	Grass	Poison	490	75	80	85	110	
52	46	Paras	Bug	Grass	285	35	70	55	45	
53	47	Parasect	Bug	Grass	405	60	95	80	60	
54	48	Venonat	Bug	Poison	305	60	55	50	40	
55	49	Venomoth	Bug	Poison	450	70	65	60	90	
56	50	Diglett	Ground		265	10	55	25	35	
57	51	Dugtrio	Ground		405	35	80	50	50	
58	52	Meowth	Normal		290	40	45	35	40	
59	53	Persian	Normal		440	65	70	60	65	
60	54	Psyduck	Water		320	50	52	48	65	
61	55	Golduck	Water		500	80	82	78	95	
62	56	Mankey	Fighting		305	40	80	35	35	
63	57	Primeape	Fighting		455	65	105	60	60	
64	58	Growlithe	Fire		350	55	70	45	70	
65	59	Arcanine	Fire		555	90	110	80	100	
66	60	Poliwag	Water		300	40	50	40	40	
67	61	Poliwhirl	Water		385	65	65	65	50	
68	62	Poliwrath	Water	Fighting	510	90	95	95	70	
69	63	Abra	Psychic		310	25	20	15	105	
70	64	Kadabra	Psychic		400	40	35	30	120	
71	65	Alakazam	Psychic		500	55	50	45	135	
72	65	AlakazamMega	Alakazam	Psychic		590	55	50	65	175
73	66	Machop	Fighting		305	70	80	50	35	
74	67	Machoke	Fighting		405	80	100	70	50	
75	68	Machamp	Fighting		505	90	130	80	65	
76	69	Bellsprout	Grass	Poison	300	50	75	35	70	

Sp..Def Speed Generation Legendary

1 65 45 1 FALSE



2	80	60	1	FALSE
3	100	80	1	FALSE
4	120	80	1	FALSE
5	50	65	1	FALSE
6	65	80	1	FALSE
7	85	100	1	FALSE
8	85	100	1	FALSE
9	115	100	1	FALSE
10	64	43	1	FALSE
11	80	58	1	FALSE
12	105	78	1	FALSE
13	115	78	1	FALSE
14	20	45	1	FALSE
15	25	30	1	FALSE
16	80	70	1	FALSE
17	20	50	1	FALSE
18	25	35	1	FALSE
19	80	75	1	FALSE
20	80	145	1	FALSE
21	35	56	1	FALSE
22	50	71	1	FALSE
23	70	101	1	FALSE
24	80	121	1	FALSE
25	35	72	1	FALSE
26	70	97	1	FALSE
27	31	70	1	FALSE
28	61	100	1	FALSE
29	54	55	1	FALSE
30	79	80	1	FALSE
31	50	90	1	FALSE
32	80	110	1	FALSE

33	30	40	1	FALSE
34	55	65	1	FALSE
35	40	41	1	FALSE
36	55	56	1	FALSE
37	85	76	1	FALSE
38	40	50	1	FALSE
39	55	65	1	FALSE
40	75	85	1	FALSE
41	65	35	1	FALSE
42	90	60	1	FALSE
43	65	65	1	FALSE
44	100	100	1	FALSE
45	25	20	1	FALSE
46	50	45	1	FALSE
47	40	55	1	FALSE
48	75	90	1	FALSE
49	65	30	1	FALSE
50	75	40	1	FALSE
51	90	50	1	FALSE
52	55	25	1	FALSE
53	80	30	1	FALSE
54	55	45	1	FALSE
55	75	90	1	FALSE
56	45	95	1	FALSE
57	70	120	1	FALSE
58	40	90	1	FALSE
59	65	115	1	FALSE
60	50	55	1	FALSE
61	80	85	1	FALSE
62	45	70	1	FALSE
63	70	95	1	FALSE

```

64  50  60    1 FALSE
65  80  95    1 FALSE
66  40  90    1 FALSE
67  50  90    1 FALSE
68  90  70    1 FALSE
69  55  90    1 FALSE
70  70 105    1 FALSE
71  95 120    1 FALSE
72  95 150    1 FALSE
73  35  35    1 FALSE
74  60  45    1 FALSE
75  85  55    1 FALSE
76  30  40    1 FALSE

```

```
[ reached 'max' /getOption("max.print") -- omitted 724 rows ]
```

```
> nrow(Pokemon)
```

```
[1] 800
```

```
> ncol(Pokemon)
```

```
[1] 13
```

```
> min(Pokemon$HP)
```

```
[1] 1
```

```
> max(Pokemon$HP)
```

```
[1] 255
```

```
> min(Pokemon$Speed)
```

```
[1] 5
```

```
> max(Pokemon$Speed)
```

```
[1] 180
```

```
> is.na(Pokemon$abilities)
```

```
logical(0)
```

```
> sum(is.na(Pokemon$abilities))
```

```
[1] 0
```

```
> colnames(Pokemon)[colnames(Pokemon)=='type1']<-"Pokemon_type"
```

```

> colnames(Pokemon)[colnames(Pokemon)=="type1"]<-"Pokemon_type"
> colnames(Pokemon)
[1] "X."      "Name"    "Type.1"  "Type.2"  "Total"   "HP"
[7] "Attack"  "Defense" "Sp..Atk" "Sp..Def" "Speed"   "Generation"
[13] "Legendary"
> colnames(Pokemon)=="type1"
[1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
> colnames(Pokemon)=="type2"
[1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
> colnames(Pokemon)=="name"
[1] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
> library(dplyr)

```

Attaching package: 'dplyr'

The following objects are masked from 'package:stats':

filter, lag

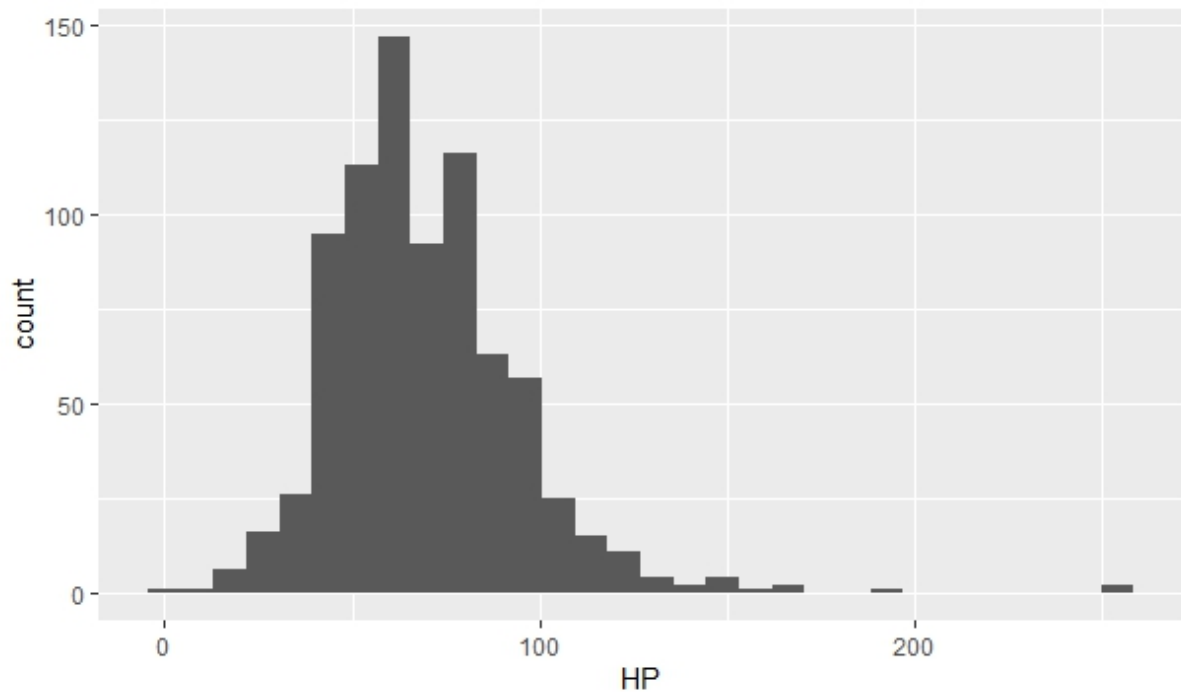
The following objects are masked from 'package:base':

intersect, setdiff, setequal, union

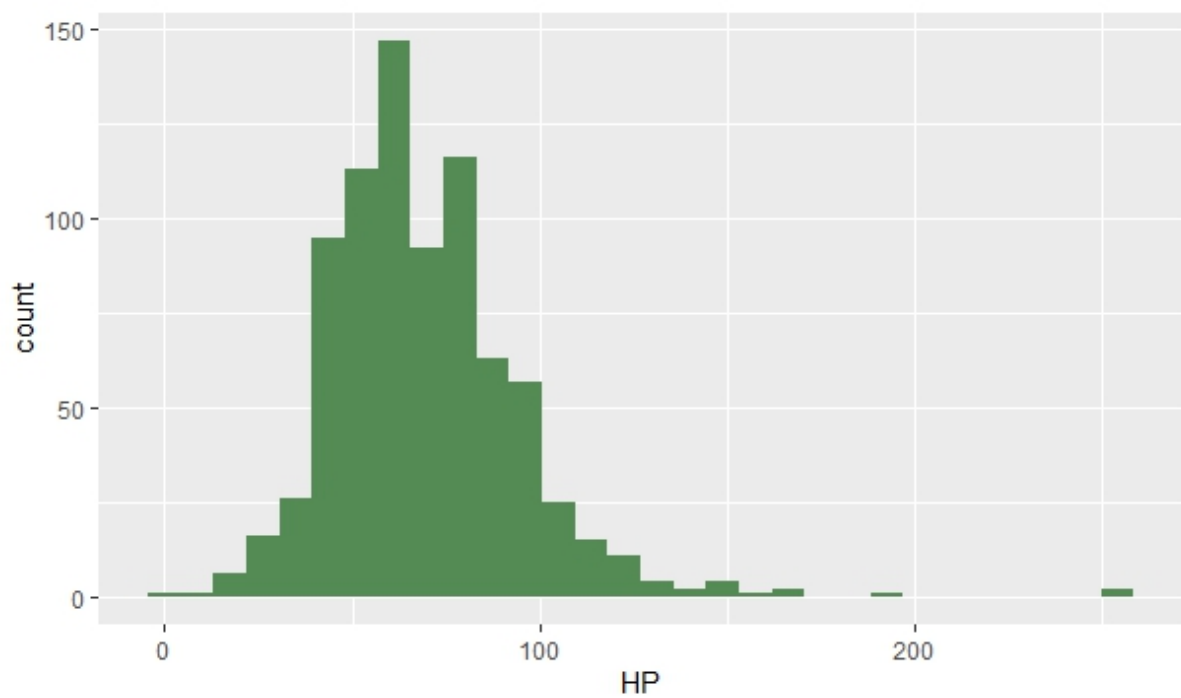
```

> library(ggplot2)
> ggplot(data=Pokemon,aes(x=HP))+
+ geom_histogram()
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.

```



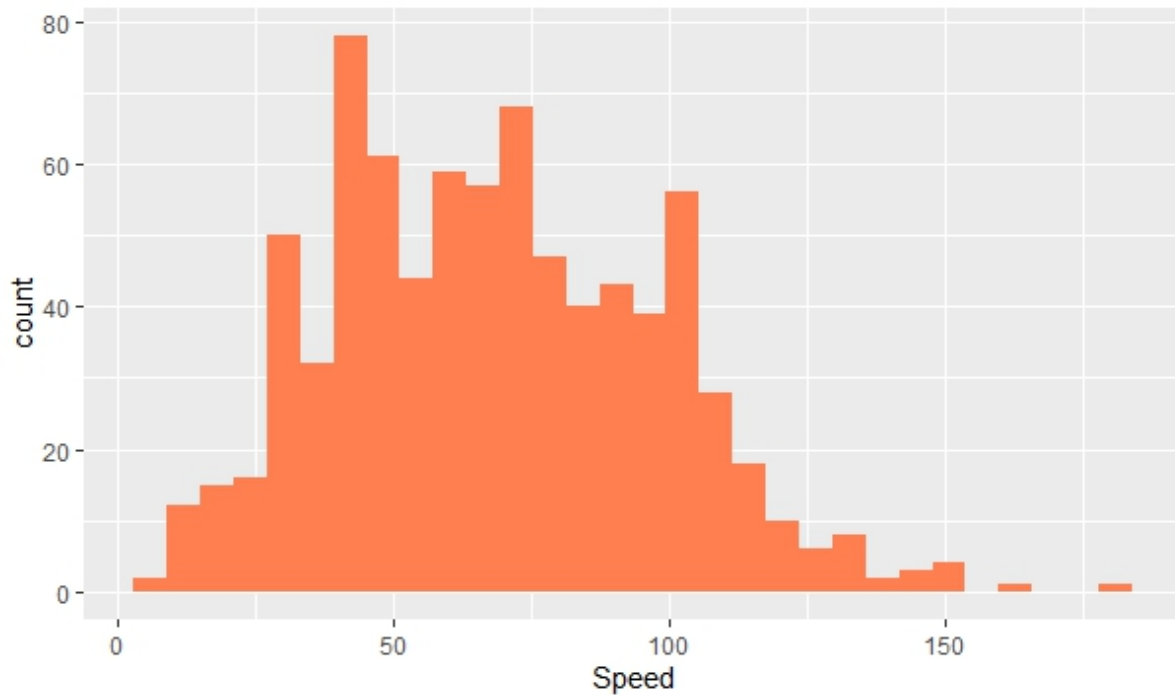
```
> ggplot(data=Pokemon,aes(x=HP))+  
+ geom_histogram(fill="palegreen4")  
'stat_bin()' using 'bins = 30'. Pick better value with 'binwidth'.
```



```
> ggplot(data=Pokemon,aes(x=Speed))+
```

```
+ geom_histogram(fill="coral")
```

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



```
> mean(Pokemon$Attack)
```

```
[1] 79.00125
```

```
> mean(Pokemon$Speed)
```

```
[1] 68.2775
```

```
> mean(Pokemon$Defence)
```

```
[1] NA
```

Warning message:

In mean.default(Pokemon\$Defence) :

argument is not numeric or logical: returning NA

```
> min(Pokemon$Defence)
```

```
[1] Inf
```

Warning message:

In min(Pokemon\$Defence) : no non-missing arguments to min; returning Inf

```
> max(Pokemon$Defence)
```

```
[1] -Inf
```

Warning message:

In `max(Pokemon$Defence)` : no non-missing arguments to `max`; returning `-Inf`

```
> ggplot(data=Pokemon,aes(x=Generation,fill=as.factor(Generation)))+  
+ geom_bar()
```

