

Ninja Queries

1. Damage profile of each weapon.

Weapons have a minimum and a maximum amount of damage, and the damage is either randomly chosen between the two values (i.e. each number between the minimum and maximum has an equal probability) or it's normally distributed (i.e. a Gaussian distribution, where the middle values are more common than the extremes).

- Code: The damage profile for each weapon.

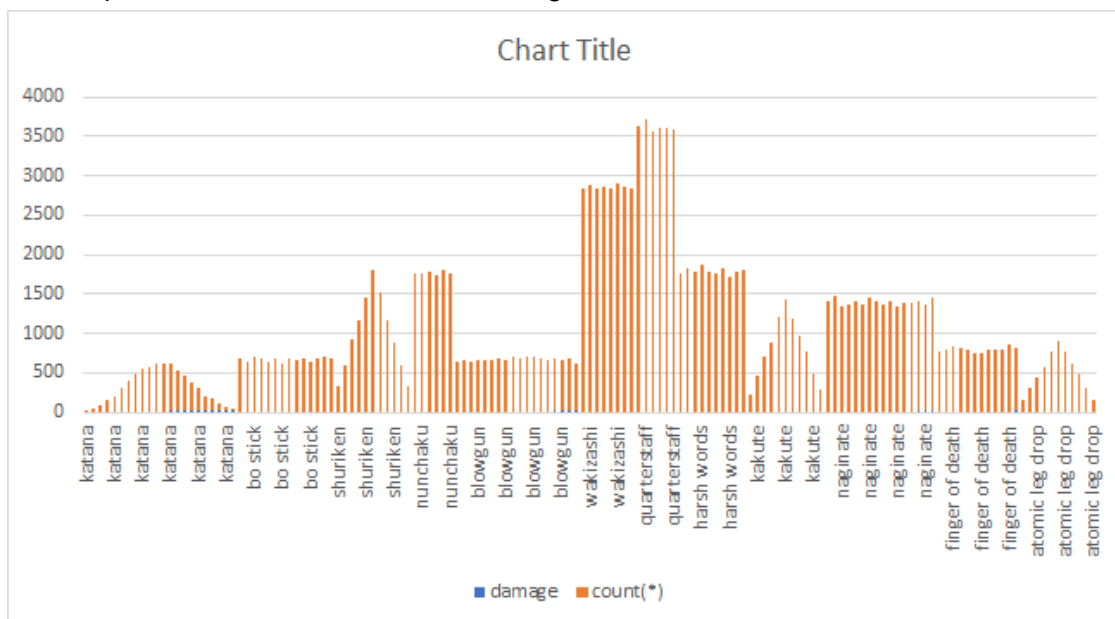
```
select name, damage, count(*)
from attack, weapon
where weapon_id = id
and success = 1
group by weapon_id, damage
```

- Analysis

As can be seen, there are only 4 weapons (followed by its peak) that have normally distributed damage: *katana* - 612, *shuriken* - 1784, *kakute* - 1425, and *atomic leg drop* - 897.

On the other hand, the 8 remaining weapons have an even distribution with approximately equal probability: *bo stick* - 670, *nunchaku* - 1780, *blow gun* - 650, *wakizashi* - 2850, *quarterstaff* - 3600, *harsh words* - 1780, *naginate* - 1390, and *finger of death* - 800.

The graph below further illustrates the distribution of each weapon's damage with bell shaped normal distribution and rectangular even distribution.



2. The likelihood of each ninja attacking every other ninja.

- The likelihood of each ninja attacking every other ninja.

- Code:

```
select n1.name as attacker, n2.name as defender, count(*)
from attack a, ninja n1, ninja n2
where a.attacker_id = n1.id
and a.defender_id = n2.id
group by attacker_id, defender_id
```

- Analysis

In general, Bob, Fatima, Petri, Wu, Yasmine, and Zerubabel's attacks on other ninjas have a normal distribution, while the 10 other ninjas have evenly distributed attacks' likelihood.

Hai attacks other ninjas approximately 900 times, but, significantly attacks Jess and Salvador twice as many as other ninjas.

Similarly, Ibrahim is likely to attack Kiva and Nana 1600 times compared to about 800 times to the majority and notably attack Romeo 3000 times.

Jess's likelihood to attack stays at around 800 times, but he is more likely to attack Nana, Wu, Xochitl, and Zerubabel 1550 times.

Kiva's attacks also evenly distributed at 600 with remarkable 1200 times against Bob, Ibrahim, and Nana. Most significant is Kiva's likelihood of attacking Petri, which is five times as many as 600.

Leonardo is likely to attack others 800 times and his attacks against Ibrahim, Oscar, and Yasmine stand out with 1600 attacks.

Mohammed also attacks Leonardo, Romeo, Salvador, and Yasmine twice as many as he attacks others.

Nana's attack likelihood is about 1000 with outstanding 3000 times against Romeo.

Oscar tends to attack other ninjas 900 times, but he attacks Nana and Yasmie 1800 and 2900 times respectively.

Quianna attacks evenly at 1000, except for attacks against Bob, Ibrahim, and Leonardo (2000 times).

Romeo is likely to attack only Leonardo twice as many as he attacks the others.

Similarly, Salvado tends to attack Quiana twice as many and attack Yasmine four times more.

Last but not least, Xochitl is likely to attack other ninjas 800 times, while attacking Nana 1600 times and especially attacking Oscar three times as many.

- Ninjas who never attack other ninjas.

- Code:

```
select n1.name, n2.name
```

```
from ninja n1, ninja n2
where n1.id <> n2.id
```

except

```
select n1.name as attacker, n2.name as defender
from attack a, ninja n1, ninja n2
where a.attacker_id = n1.id
and a.defender_id = n2.id
group by attacker_id, defender_id
```

- Analysis

While ninjas constantly attack each other, there are nine ninjas that have never attacked some other ninjas as shown above. They are most likely never attack three other ninjas.

Overall, it can be inferred that half of the number of ninjas attacks every other ones.

3. Ninja's Preferences

- Year

- Code:

```
select n.name, year, count(*)
from ninja n,(select strftime('%Y', ttime) as year, attacker_id, defender_id
              from attack)
where n.id = attacker_id
group by attacker_id, year
```

- Result: 198 rows

- Month

- Code

```
select n.name, month, count(*)
from ninja n,(select strftime('%m', ttime) as month, attacker_id, defender_id
              from attack)
where n.id = attacker_id
group by attacker_id, month
```

- Day

- Code

```

select n.name, day, count(*)
from ninja n,(select strftime('%d', ttime) as day, attacker_id, defender_id
               from attack)
where n.id = attacker_id
group by attacker_id, day

```

- Analysis

The first table has 198 rows = 18(ninjas) * 11(years). The second table has 216 rows = 18(ninjas) * 12(months). The second table has 558 rows = 18(ninjas) * 31(days). Thus, there is no ninja that does not attack on some days, months, or years.

In general, there is no significant pattern in the year and month of attacks, which is around 1500 and 1400 respectively. Regarding the day of attacks, there is a smaller number in day 30 and mostly day 31 due to the difference in each month's maximum day.

Therefore, we build another table with the year, month, and day that have the maximum number of attacks by each ninja as below.

- Code

```

select lt1.name, lt1.year, lt2.month, lt3.day
from
  (select name, year, max(ttime)
   from(select n.name, year, count(*) as ttime
        from ninja n,(select strftime('%Y', ttime) as year, attacker_id, defender_id
                       from attack)
        where n.id = attacker_id
        group by attacker_id, year)
   group by name) lt1

```

inner join

```

(select name, month, max(ttime)
 from(select n.name, month, count(*) as ttime
       from ninja n,(select strftime('%m', ttime) as month, attacker_id, defender_id
                      from attack)
       where n.id = attacker_id
       group by attacker_id, month)
 group by name) lt2

```

on lt1.name = lt2.name

inner join

```

(select name, day, max(ttime)
 from(select n.name, day, count(*) as ttime
 from ninja n,(select strftime('%d', ttime) as day, attacker_id, defender_id
 from attack)
 where n.id = attacker_id
 group by attacker_id, day)
 group by name) lt3

```

on lt3.name = lt2.name

- Result

name	year	month	day
bob	2011	9	26
fatima	2010	10	9
hai	2010	7	28
ibrahim	2013	5	15
jess	2013	11	28
kiva	2014	5	12
leonardo	2014	8	22
mohammed	2018	1	16
nana	2020	1	16
oscar	2019	11	26
petri	2017	6	27
quianna	2017	10	8
romeo	2011	7	1
salvador	2016	5	22
wu	2016	3	25
xochitl	2014	12	7
yasmin	2010	8	26
zerubabel	2012	7	13

- Analysis

As can be seen, each ninja's attack time preference is random.

4. Attack Time During the Day

- Hour

- Code

```
select n.name, hour, count(*)
from ninja n,(select strftime('%H', ttime) as hour, attacker_id, defender_id
               from attack)
where n.id = attacker_id
group by attacker_id, hour
```

- Minute

- Code

```
select n.name, minute, count(*)
from ninja n, (select strftime('%M', ttime) as minute, attacker_id, defender_id
               from attack)
where n.id = attacker_id
group by attacker_id, minute
```

- Second

- Code

```
select n.name, second, count(*)
from ninja n,(select strftime('%S', ttime) as second, attacker_id, defender_id
               from attack)
where n.id = attacker_id
group by attacker_id, second
```

- Analysis

Since the three table above distributed evenly around 700 hours, 300 minutes, and 300 seconds, the time of day (hour, minute, second) of attacks was randomly chosen.

5. Likelihood of a successful attack with a weapon

- Code

```
select lt1.name, lt1.hitpct, round( (suc*1.0) / (hit*1.0), 2) as realhitpct
from(select name, weapon_id, hitpct, count(*) as suc
     from attack, weapon
     where success = 1
     and weapon_id = id
     group by weapon_id) as lt1
inner join
(select weapon_id, count(*) as hit
```

```

from attack
group by weapon_id) as lt2
on lt1.weapon_id = lt2.weapon_id

```

- Result

name	hitpct	realhitpct
katana	0.52	0.52
bo stick	0.71	0.65
shuriken	0.71	0.65
nunchaku	0.35	0.44
blowgun	0.51	0.46
wakizashi	0.42	0.42
quarterstaff	0.41	0.5
harsh words	0.66	0.73
kakute	0.33	0.42
naginate	0.68	0.68
finger of death	0.46	0.46
atomic leg drop	0.5	0.5

- Analysis

Nearly half the `hitpct` (i.e. the likelihood of a successful attack with a weapon) in the weapons table is accurate for each weapon, which includes katana, wakizashi, naginate, finger of death, and atomic leg drop. The other weapon's given `hitpct` are largely differed by 10%.

Likelihood of using each weapon

- Code

```

select n.name as ninjaname, w.name as weaponname, count(*)
from attack a, weapon w, ninja n
where a.weapon_id = w.id
and a.attacker_id = n.id
group by attacker_id, a.weapon_id

```

- Analysis

Since the table contains 216 rows = 18(ninjas) * 12(weapons), there is no ninja that does not use any weapon.

Overall, each ninja's weapon usage is fairly normal. However, there are several weapons that are used more significantly than others.

Bob: wakizashi; Fatima: blowgun; Hai: nunchaku, wakizashi, harsh words, atomic leg drop; Ibrahim: wakizashi; Jess: Naginate; Kiva: wakizashi, quarterstaff; Leonardo: quaterstaff; Mohammed: katana, nunchaku; Nana: wakizashi, quarterstaff; Oscar: naginate; Petri: quarterstaff; Quianna: wakizashi; Romeo: wakizashi; Salvador: wakizashi; Xochitl: Naginate, Yasmine: quarterstaff; Zerubabel: atomic leg drop.

We have a new table that shows each ninja's favorite weapon.

- Code

```
select lt.ninjaname, lt.weaponname, max(usage)
from
(select n.name as ninjaname, w.name as weaponname, count(*) as usage
from attack a, weapon w, ninja n
where a.weapon_id = w.id
and a.attacker_id = n.id
group by attacker_id, a.weapon_id) lt
group by lt.ninjaname
```

- Result

ninjaname	weaponname	max(usage)
bob	wakizashi	8447
fatima	blowgun	2787
hai	atomic leg drop	3012
ibrahim	wakizashi	2472
jess	naginate	8417
kiva	quarterstaff	2361
leonardo	quarterstaff	8239
mohammed	wakizashi	2733
nana	quarterstaff	2336
oscar	naginate	2383
petri	quarterstaff	2473
quianna	wakizashi	8167
romeo	wakizashi	3253
salvador	wakizashi	8301

wu	quarterstaff	2342
xochitl	naginate	8231
yasmin	quarterstaff	8317
zerubabel	finger of death	8332

- Analysis

Surprisingly, while most ranges from 2000 to 3000, there are few weapon's usages that exceeds 8000.