***Ultrasound***

***Function:***

1. ***Echolocation*** - Avoid other Predators - Locate Prey - Typically insects that fly around at night.
2. ***Detection*** - Ultrasound is used to detect the size and shape of object.

***How Echolocation Works:***

* The bat emits ultrasonic pulses, very high pitch sound waves that human can not hear.
* The bat analyzes the echoes, how the waves bounce back.
* The bat can determine if there is wall in the cave that it needs to avoid and how far away it is.

***Example of How Ultrasound can be used to detect the Size and Shape of object:***

* The bat can use Ultrasound to detect the moth, while month can detect the presence of bat. So the month can escape to safety or else the bat can just remain motionless. (Stop beating their wings.)

***Ability to use Ultrasound of bats have been Underestimated:***

* Bat can not only tell that the object is a tree but also can distinguish between Pine Tree and Deciduous Tree just by using the leaves.
* But How - By using the echo of all the leaves as whole that matters.
  + The Pine Tree with all little densely packed needles can produce a large number of faint reflections - which is called ***Smooth Echo. The Wave Form is Even.***
  + The Oak has fewer but bigger leaves with stronger reflections - which is called ***Rough Echo. The Wave Form is Jagged.***