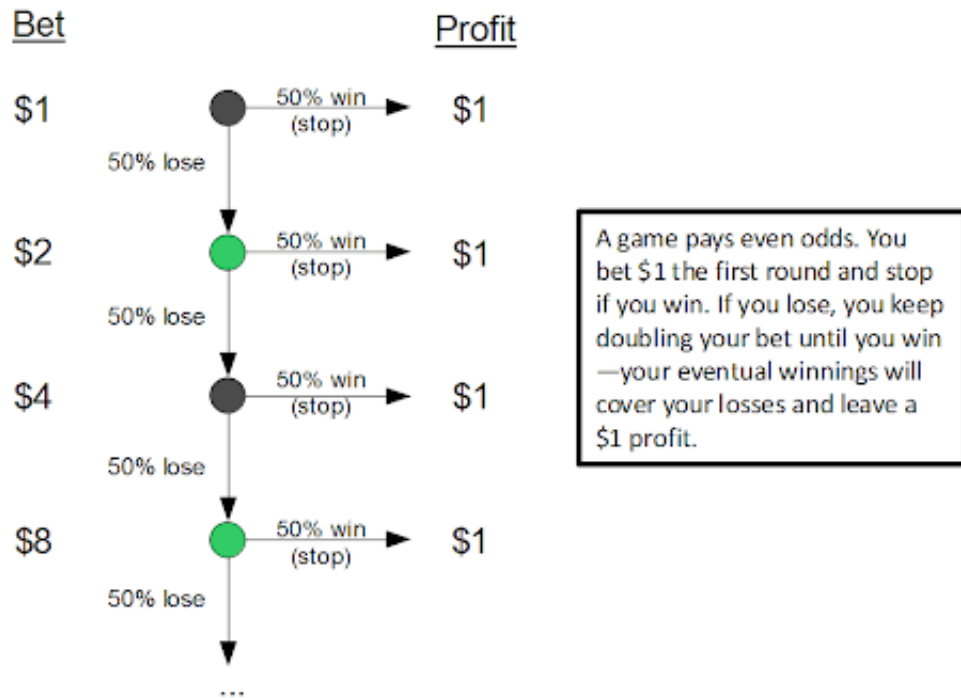


Week7 Notes

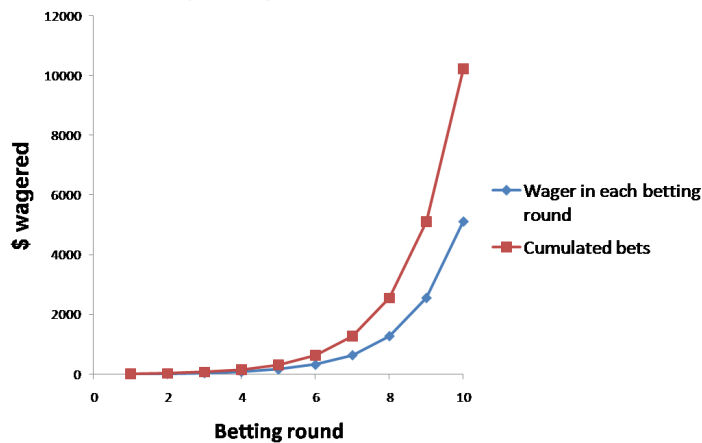
Introduction to Martingale

- Martingale is a well known gambling strategy.
- Martingale betting strategy:



Source: Anonymous

- Drawback of the martingale system is that bet amount rises exponentially (nobody has infinite wealth) and profit is low .



Source: pokerbankrollblog.com

- Keep in mind: House always wins!

ArrayList:

- In arrays, we have to declare the size and it is fixed. What if we need to change the size dynamically?
- ArrayList allows you store your data in a vector without declaring the size and add/remove while vector size adapts these actions dynamically.
- Syntax:
`ArrayList<-datatype-> -arraylist_name- = new ArrayList<-datatype->();`
- ArrayList Functions:
 - `.add(-element-)`: Adds a new element to the end of the ArrayList; the return value is always true.
 - `.add(-index-, -element-)` : Inserts a new element into the ArrayList before the position specified by index.
 - `.remove(-index-)` : Removes the element at the specified position and returns that value.
 - `.remove(-element-)` : Removes the first instance of element, if it appears; returns true if a match is found.
 - `.clear()`: Removes all elements from the ArrayList.
 - `.size()`: Returns the number of elements in the ArrayList.
 - `.get(-index-)`: Returns the object at the specified index.
 - `.set(-index-, -value-)`: Sets the element at the specified index to the new value and returns the old value.
 - `.indexOf(-value-)`: Returns the index of the first occurrence of the specified value, or -1 if it does not appear.
 - `.contains(-value-)`: Returns true if the ArrayList contains the specified value.
 - `.isEmpty()`: Returns true if the ArrayList contains no elements.
- Note: Try to declare your variables as private inside the class.

Random Numbers and Outcomes:

- Keep in mind, your functions can also return objects.
- Recall: Generalized syntax for return type functions:

```
-access_modifier- -return_type- -function_name- (-input_parameters_with_types-){  
  //CODE  
  return -return_variable-;  
}
```

- Random numbers make it possible to write programs that simulate random processes.

- Math.random(-integer_value-): generates double number in between [0,-integer_value-) //default [0,1)
- Is it possible to generate “true” random numbers? For geeks 🤖
<https://engineering.mit.edu/engage/ask-an-engineer/can-a-computer-generate-a-truly-random-number/>

Seeds:

- Seeds enable us to replicate a simulation. Whenever you use seed number, computer will generate same random numbers in the same order.
- To generate random numbers from a seed, you need a random object.
- Syntax:

```
import java.util.Random;
```

```
Random -name- = new Random();  
-name-.setSeed(-seed_number-);
```

Some functions:

```
-name-.nextInt(-integer_value-); //generates integer random number in between [0,-integer_value-) - default [0,1)  
-name-.nextDouble(); //generates double random number in between [0,1)
```

- For more details
see: <https://docs.oracle.com/en/java/javase/11/docs/api/java.base/java/util/Random.html>