LAB 1 CSE 107
I chose to solve the problem in C++.

```
#include <iostream>

float tosstrials(int n, int trials, float p) {
  int Alice = n, Bob = n+1, BobWin=0;
  p*=10;
  for (int i = trials; i > 0; i--){
    int AliceHeads=0, BobHeads=0;
    for (int a = Alice; a>0; a--) if (p <= (rand() % 10 + 1)) AliceHeads++;
    for (int a = Bob; a>0; a--) if (p <= (rand() % 10 + 1)) BobHeads++;
    if (BobHeads > AliceHeads) BobWin++;
  }
  return static_cast<float>(BobWin) / static_cast<float>(trials);
}

int main() {
  std::cout << "--------------------\np\trelative frequency\n--------------------\n";
  for (float i = 0.2; i<=0.9; i+=0.1){
    std::cout << i << "\t" << tosstrials (100, 1000, i) << "\n";
  }
  return 0;
}
```

OUTPUT:

```
> sh -c make -s
> ./main
--------------------
p   relative frequency
--------------------
0.2 0.526
0.3 0.537
0.4 0.498
0.5 0.465
0.6 0.505
0.7 0.472
0.8 0.475
>
```

CONJECTURE:
The probability that Bob beats Alice will be **1/2, independent of the value of p.**