Repetition Practice Problems with while loop

1. Write a program that takes a command-line argument n and prints a table of the powers of 2 that are less than or equal to 2^n till 256 is reached..

```
  GNU nano 6.4                                  6_2-1.sh
n=$1
i=0
result=1

while [[ $i -le $n && $result -le 256 ]]; do
  echo "2^$i = $result"
  result=$((result * 2))
  i=$((i + 1))
done
```

```
Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-1.sh
2^0 = 1

Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-1.sh  5
2^0 = 1
2^1 = 2
2^2 = 4
2^3 = 8
2^4 = 16
2^5 = 32

Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-1.sh  10
2^0 = 1
2^1 = 2
2^2 = 4
2^3 = 8
2^4 = 16
2^5 = 32
2^6 = 64
2^7 = 128
2^8 = 256
```

2. Find the Magic Number
    a. Ask the user to think of a number n between 1 to 100
    b. Then check with the user if the number is less then n/2 or greater
    c. Repeat till the Magic Number is reached..

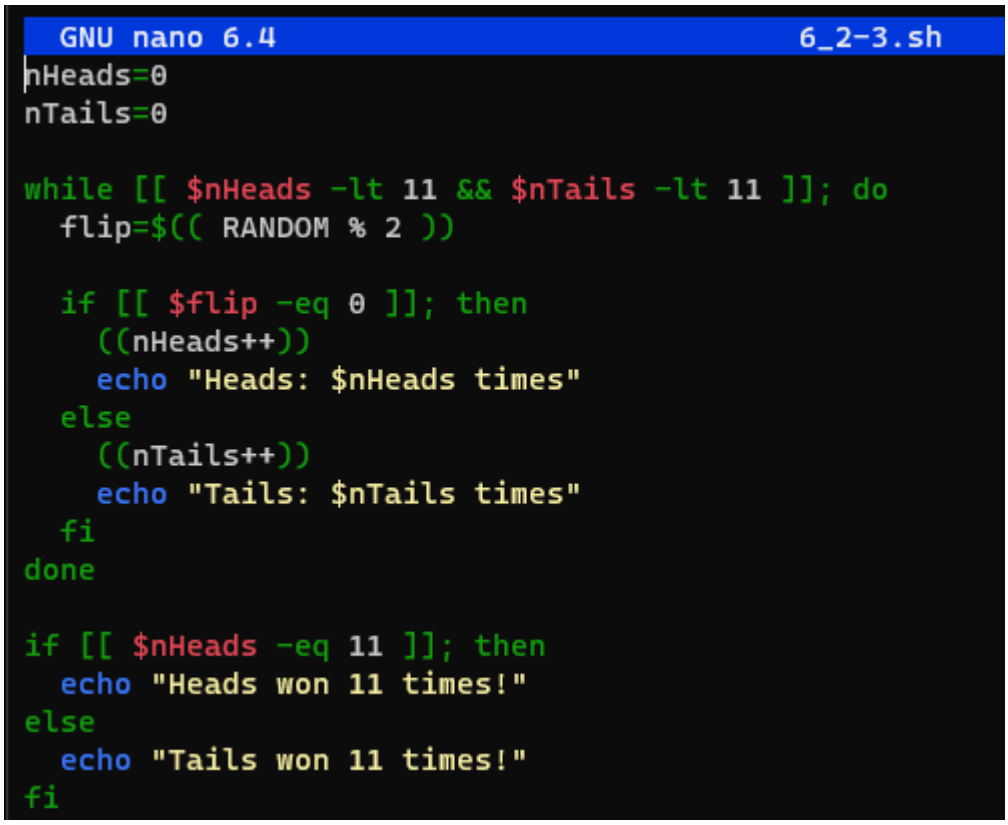
```
  GNU nano 6.4                                  6_2-2.sh
low=1
high=100

while [[ $low -le $high ]]; do
  mid=$(( (low + high) / 2 ))
  echo "Is your number $mid?"
  read response

  if [[ $response == "yes" ]]; then
    echo "Your magic number is $mid!"
    break
  elif [[ $response == "greater" ]]; then
    low=$((mid + 1))
  elif [[ $response == "lesser" ]]; then
    high=$((mid - 1))
  else
    echo "Invalid input, please enter 'yes', 'greater' or 'lesser'."
  fi
done
```

```
Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-2.sh
Is your number 50?
greater
Is your number 75?
greater
Is your number 88?
lesser
Is your number 81?
lesser
Is your number 78?
lesser
Is your number 76?
yes
Your magic number is 76!
```

3. Extend the Flip Coin problem till either Heads or Tails wins 11 times.



```
Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-3.sh
Tails: 1 times
Heads: 1 times
Tails: 2 times
Tails: 3 times
Heads: 2 times
Heads: 3 times
Tails: 4 times
Heads: 4 times
Tails: 5 times
Tails: 6 times
Heads: 5 times
Tails: 7 times
Tails: 8 times
Heads: 6 times
Heads: 7 times
Tails: 9 times
Heads: 8 times
Heads: 9 times
Tails: 10 times
Tails: 11 times
Tails won 11 times!

Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-3.sh
Heads: 1 times
Tails: 1 times
Tails: 2 times
Heads: 2 times
Tails: 3 times
Tails: 4 times
Tails: 5 times
Tails: 6 times
Heads: 3 times
Heads: 4 times
Heads: 5 times
Heads: 6 times
Tails: 7 times
Heads: 7 times
Heads: 8 times
Heads: 9 times
Heads: 10 times
Heads: 11 times
Heads won 11 times!
```

4. Write a Program where a gambler starts with Rs 100 and places Re 1 bet until he/she goes broke i.e. no more money to gamble or reaches the goal of Rs 200. Keeps track of number of times won and number of bets made.

```
  GNU nano 6.4                                    6_2-4.sh
start_amount=100
goal=200
total_bets=0
wins=0

while [[ $start_amount -gt 0 && $start_amount -lt $goal ]]; do
  bet=$(( RANDOM % 2 ))

  if [[ $bet -eq 1 ]]; then
    ((start_amount++))
    ((wins++))
  else
    ((start_amount--))
  fi
  ((total_bets++))
done

echo "Total bets: $total_bets"
echo "Wins: $wins"

if [[ $start_amount -eq $goal ]]; then
  echo "Gambler reached the goal of Rs 200!"
else
  echo "Gambler went broke!"
fi
```

```
Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-4.sh
Total bets: 1372
Wins: 636
Gambler went broke!

Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-4.sh
Total bets: 12222
Wins: 6061
Gambler went broke!

Shri@PRODUCTIVITY-4 MINGW64 ~/Testing_Bridge/repoPortal/repo1/D6 (main)
$ sh 6_2-4.sh
Total bets: 9656
Wins: 4878
Gambler reached the goal of Rs 200!
```