This program simulates a 2bit adder system for the Kotlin language. The following step by step guild will walk you thought the creation of the program.

Step 1) make the class and get user input

example3 > binary_adder.kt

```kotlin
/*
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part of phase 3 for programming lang class. this is program 3, the number guessing game
 */

fun main(args: Array<String>) {

    //greet user
    println("This is a 2 bit adder system. Enter in 2 numbers that are base 10 and they will be added\n\n
    //get the users first number
    println("please enter in number 1:")
    print("-->")
    var user1 = readLine()!!
    //get the users second number
    println("please enter in number 2:")
    print("-->")
    var user2 = readLine()!!
```

Create a binary_adder.kt file, within that file we are going to greet the user and get the 2 values they want to add together.

Step2) make a bit string class to convert the 2 user numbers

example3 > bit_string.kt

```
6   class bit_string(var base10: Int){
7
8       //variables needed in the class
9       var base2Str: String = Integer.toBinaryString(base10)
10      var base2Arr = Array(base2Str.length) {i -> 0}
11
12      //default method for the class
13      init{
14          makeBitString()
15      }
16
17      // a fucntion that will take the base 10 value and make it into a base 2 value
18      fun makeBitString(){
19
20          // a counter to keep track of what bit we are on
21          var current = 0
22
23          // adds in values form the back of the array to the front
24          for ( i in base2Arr.size-1 downTo 0 step 1){
25              //checks to see if we even need to look
26              if ( current <= base2Str.length-1){
27                  //sets value in the bit array to the value from the number
28                  base2Arr[i] = if (base2Str[(base2Str.length-1) - current] == '1'){
29                                    1
30                                }
31                                else{
32                                    0
33                                }
34              }
35              //increase counter
36              current++
37          }
38      }
39  }
```

In this step, we are creating a class that will hold the 2 numbers that the user gives us and also convert the numbers in to a array that will be the base 2 respiration of the number.

Step3) we create the 2 bit string objects and show what they are to the user

```
//making bit objects for the 2 numbers
var bit1 = bit_string(user1.toInt())
var bit2 = bit_string(user2.toInt())

//show the user what they entered
println("your first number in base 10 is: ${bit1.base10}")
println("in base 2 it is: ${bit1.base2Str}\n")
println("your second number in base 10 is: ${bit2.base10}")
println("in base 2 it is: ${bit2.base2Str}\n")
```

Step4) Make a function that will add the 2 bit string objects together to form a new bitstring object

```
43
44  // this function adds 2 bit_string objects together and returns a new bit_string
45  fun addBits(bit1: bit_string, bit2: bit_string): bit_string{
46
47      var bitReturn: bit_string = bit_string( (bit1.base10 + bit2.base10)  )
48
49      return bitReturn
50  }
```

Step5) finally, call the method we just created and display the results to the user

```
    //make a new bit number that is the added value of the 2 numbers from the user
    var addedBit = addBits(bit1, bit2)

    //display the results of the 2 numbers being added
    println("\nYour answer in base 10 is: ${addedBit.base10}")
    println("in base 2 it is: ${addedBit.base2Str}")

    //saying bye to the user
    println("\n\nThanks for using the program!")

}
```

Step6) compile and run the code and see your work in action!

```
@kotlinc binary_adder.kt bit_string.kt -include-runtime -d binary_adder.jar
@clear
@java -jar binary_adder.jar
```