

**Problem 1:****Part A:**

```
# Prompt the user for their guess
def prompt_guess():
    return 55

# Check the user's guess against the game's number
# -1 is too low
# 0 is the correct number
# 1 is too high
def check_guess(guess, correct_num):
    return 1

# Prompt the user for a guess and loop until their guess is correct
# Returns number of how many guesses the user needed
def loop_guesses(correct_num):
    return 5

# Generate the random number for the game to use
def generate_num():
    return 67

# Calculate the user's winnings based on their number of guesses
def calc_winnings(guess_count):
    return 3

# Display the user's winnings for the round, along with their total winnings
def show_winnings(win_round, win_total):
    return

# Prompts the user to ask them if they want to go to the next round
def prompt_repeat():
    return True

# Loop through each of the game rounds, stopping when the user decides to exit
def loop_rounds():
    return
```

**Part B:**

```
import random

# Prompt the user for their guess
def prompt_guess():
    num_raw = raw_input("Can you guess what number I'm thinking of? ")

    return int(num_raw)

# Check the user's guess against the game's number
# -1 is too low
# 0 is the correct number
# 1 is too high
def check_guess(guess, correct_num):
    if guess == correct_num:
        return 0
    elif guess < correct_num:
        return -1
    elif guess > correct_num:
        return 1

# Prompt the user for a guess and loop until their guess is correct
# Returns number of how many guesses the user needed
def loop_guesses(correct_num):
    guess = -1
    guess_count = 0

    while guess != correct_num:
        guess = prompt_guess()
        guess_count += 1

        guess_status = check_guess(guess, correct_num)

        if guess_status == 0:
            print "Your guess was correct!"
            print "You guessed the number in", guess_count, "guesses!"

            return guess_count

        elif guess_status == -1:
            print "Your guess was too low. Try again!"
        else:
            print "Your guess was too high. Try again!"

    if guess_count == 7:
        print "You're out of guesses!"
        print "The number I was thinking of was " + str(correct_num) + "!"
        return 8

    print
```

```
# Generate the random number for the game to use
def generate_num():
    random.seed()
    num = random.randint(1, 100)

    return num

# Calculate the user's winnings based on their number of guesses
def calc_winnings(guess_count):
    if guess_count == 8:
        return -10
    if guess_count == 7:
        return 0

    return 8 - guess_count

# Display the user's winnings for the round, along with their total winnings
def show_winnings(win_round, win_total):
    if win_round >= 0:
        print "You won $" + str(win_round) + " this round"
    else:
        print "You have lost $" + str(abs(win_round)) + " this round"

    if win_total > 0:
        print "You have $" + str(win_total) + " so far"
    else:
        print "You have -$" + str(abs(win_total)) + " so far"

    print

# Prompts the user to ask them if they want to go to the next round
def prompt_repeat():
    prompt = raw_input("Would you like to play another round (y/n)? ")

    prompt = prompt.lower()

    if prompt == 'y' or prompt == 'yes':
        return True
    elif prompt == 'n' or prompt == 'no':
        return False
    else:
        "I'm sorry, I don't know what you're saying."
        print
        return prompt_repeat()

# Loop through each of the game rounds, stopping when the user decides to exit
def loop_rounds():
    playing = True
    game_winnings = 0

    while playing:
        print "I am thinking of a number between 1 and 100."
```

```
num = generate_num()

guesses = loop_guesses(num)
round_winnings = calc_winnings(guesses)
game_winnings += round_winnings

show_winnings(round_winnings, game_winnings)

playing = prompt_repeat()

loop_rounds()
```

I am thinking of a number between 1 and 100.  
Can you guess what number I'm thinking of? 50  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 75  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 62  
Your guess was correct!  
You guessed the number in 3 guesses!  
You won \$5 this round  
You have \$5 so far

Would you like to play another round (y/n)? y  
I am thinking of a number between 1 and 100.  
Can you guess what number I'm thinking of? 50  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 51  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 52  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 53  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 54  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 5  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 1  
Your guess was too low. Try again!  
You're out of guesses!  
The number I was thinking of was 3!  
You have lost \$10 this round  
You have -\$5 so far

Would you like to play another round (y/n)? n

**Part B Extra Credit:**

```
import random

correct_num = -1
guess = -1
guess_count = 0

win_round = 0
win_total = 0

# Prompt the user for their guess
def prompt_guess():
    global guess

    num_raw = raw_input("Can you guess what number I'm thinking of? ")

    guess = int(num_raw)

# Check the user's guess against the game's number
# -1 is too low
# 0 is the correct number
# 1 is too high
def check_guess():
    if guess == correct_num:
        return 0
    elif guess < correct_num:
        return -1
    elif guess > correct_num:
        return 1

# Prompt the user for a guess and loop until their guess is correct
# Returns number of how many guesses the user needed
def loop_guesses():
    global guess
    global guess_count

    guess = -1
    guess_count = 0

    while guess != correct_num:
        prompt_guess()
        guess_count += 1

        guess_status = check_guess()

        if guess_status == 0:
            print "Your guess was correct!"
            print "You guessed the number in", guess_count, "guesses!"

            return

        elif guess_status == -1:
            print "Your guess was too low. Try again!"
        else:
```

```
        print "Your guess was too high. Try again!"

    if guess_count == 7:
        print "You're out of guesses!"
        print "The number I was thinking of was " + str(correct_num) + "!"
        return 8

    print

# Generate the random number for the game to use
def generate_num():
    global correct_num

    random.seed()
    correct_num = random.randint(1, 100)

# Calculate the user's winnings based on their number of guesses
def calc_winnings():
    global win_round

    if guess_count == 8:
        return -10
    if guess_count == 7:
        return 0

    win_round = 8 - guess_count

# Display the user's winnings for the round, along with their total winnings
def show_winnings():
    if win_round >= 0:
        print "You won $" + str(win_round) + " this round"
    else:
        print "You have lost $" + str(abs(win_round)) + " this round"

    if win_total > 0:
        print "You have $" + str(win_total) + " so far"
    else:
        print "You have -$" + str(abs(win_total)) + " so far"

    print

# Prompts the user to ask them if they want to go to the next round
def prompt_repeat():
    prompt = raw_input("Would you like to play another round (y/n)? ")

    prompt = prompt.lower()

    if prompt == 'y' or prompt == 'yes':
        return True
    elif prompt == 'n' or prompt == 'no':
        return False
    else:
        "I'm sorry, I don't know what you're saying."
```

```
        print
        return prompt_repeat()

# Loop through each of the game rounds, stopping when the user decides to exit
def loop_rounds():
    global guess_count
    global win_round
    global win_total

    playing = True
    win_total = 0

    while playing:
        print "I am thinking of a number between 1 and 100."

        generate_num()

        guess_count = loop_guesses()
        win_round = calc_winnings()
        win_total += win_round

        show_winnings()

        playing = prompt_repeat()

loop_rounds()
```

**Problem 2:****Part A:**

```
# Generates a random number between 1 and 100,000
def gen_number():
    return 15656

# Finds the number of guesses allowed for the given range
def get_guess_count(range):
    return 17

# Finds the penalty for failing to guess within the limit
def get_penalty(guess_max):
    return 24

# Finds the reward for a certain number of guesses given the guess limit
def get_reward(guess_max, guess_count):
    return 15

# Displays the number range and betting rules to the user
def show_rules(range, guess_max):
    return
```

**Part B:**

```
import random

# Generates a random number between 1 and 100,000
def generate_num():
    random.seed()
    num = random.randint(1, 100000)

    return num

# Finds the number of guesses allowed for the given range
def get_range(num):
    if num < 101:
        return (1, 100)
    if num < 1001:
        return (101, 1000)
    if num < 15001:
        return (1001, 15000)
    else:
        return (15001, 100000)
```



```
# Finds the number of guesses allowed for the given range
def get_guess_count(range_num):
    if range_num[0] == 1:
        return 7
    if range_num[0] == 101:
        return 10
    if range_num[0] == 1001:
        return 14
    if range_num[0] == 15001:
        return 17

# Finds the penalty for failing to guess within the limit
def get_penalty(guess_max):
    return -2 * guess_max

# Finds the reward for a certain number of guesses given the guess limit
def get_reward(guess_max, guess_count):
    if guess_count == guess_max + 1:
        return get_penalty(guess_max)
    if guess_count == guess_max:
        return 0

    return guess_max - guess_count + 1

# Displays the number range and betting rules to the user
def show_rules(range_num, guess_max, win_total):
    print "I am thinking of a number between", range_num[0], "and", range_num[1]

    print "You have", guess_max, "guesses allowed."
    print "You have $" + str(win_total) + " right now."
    print "If you take too many guesses, you will lose $" + \
        str(abs(get_penalty(guess_max))) + "."
    print "If you take fewer than that, you will receive a reward:"
    for i in range(1, 4):
        print str(i) + "    $" + str(get_reward(guess_max, i))

    print "..."
    print str(guess_max - 1) + "    $2"
    print str(guess_max) + "    $0"

# Prompt the user for their guess
def prompt_guess():
    num_raw = raw_input("Can you guess what number I'm thinking of? ")

    return int(num_raw)
```

```
# Check the user's guess against the game's number
# -1 is too low
# 0 is the correct number
# 1 is too high
def check_guess(guess, correct_num):
    if guess == correct_num:
        return 0
    elif guess < correct_num:
        return -1
    elif guess > correct_num:
        return 1

# Prompt the user for a guess and loop until their guess is correct
# Returns number of how many guesses the user needed
def loop_guesses(correct_num, guess_max):
    guess = -1
    guess_count = 0

    while guess != correct_num:
        guess = prompt_guess()
        guess_count += 1

        guess_status = check_guess(guess, correct_num)

        if guess_status == 0:
            print "Your guess was correct!"
            print "You guessed the number in", guess_count, "guesses!"

            return guess_count

        elif guess_status == -1:
            print "Your guess was too low. Try again!"
        else:
            print "Your guess was too high. Try again!"

        if guess_count == guess_max:
            print "You're out of guesses!"
            print "The number I was thinking of was " + str(correct_num) + "!"
            return guess_max + 1

    print

# Calculate the user's winnings based on their number of guesses
def calc_winnings(guess_count, guess_max):
    if guess_count == guess_max + 1:
        return -10
    if guess_count == guess_max:
        return 0

    return guess_max - guess_count + 1
```

```
# Display the user's winnings for the round, along with their total winnings
def show_winnings(win_round, win_total):
    if win_round >= 0:
        print "You won $" + str(win_round) + " this round"
    else:
        print "You have lost $" + str(abs(win_round)) + " this round"

    if win_total > 0:
        print "You have $" + str(win_total) + " so far"
    else:
        print "You have -$" + str(abs(win_total)) + " so far"

    print

# Prompts the user to ask them if they want to go to the next round
def prompt_repeat():
    prompt = raw_input("Would you like to play another round (y/n)? ")

    prompt = prompt.lower()

    if prompt == 'y' or prompt == 'yes':
        return True
    elif prompt == 'n' or prompt == 'no':
        return False
    else:
        "I'm sorry, I don't know what you're saying."
        print
        return prompt_repeat()

# Loop through each of the game rounds, stopping when the user decides to exit
def loop_rounds():
    playing = True
    game_winnings = 0

    while playing:

        num = generate_num()
        range_num = get_range(num)
        guess_max = get_guess_count(range_num)

        show_rules(range_num, guess_max, game_winnings)

        guesses = loop_guesses(num, range_num, guess_max)
        round_winnings = calc_winnings(guesses, guess_max)
        game_winnings += round_winnings

        show_winnings(round_winnings, game_winnings)

        playing = prompt_repeat()

loop_rounds()
```

I am thinking of a number between 1001 and 15000  
You have 14 guesses allowed.  
You have \$0 right now.  
If you take too many guesses, you will lose \$28.  
If you take fewer than that, you will receive a reward:

1	\$14
2	\$13
3	\$12
...	
13	\$2
14	\$0

Can you guess what number I'm thinking of? 7500  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 5000  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 6500  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6000  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 6250  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 6350  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 6450  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6400  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6375  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 6390  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6385  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6380  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6378  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 6376  
Your guess was too low. Try again!  
You're out of guesses!  
The number I was thinking of was 6377!  
You have lost \$10 this round

You have -\$10 so far

Would you like to play another round (y/n)? y

I am thinking of a number between 15001 and 100000

You have 17 guesses allowed.

You have \$-10 right now.

If you take too many guesses, you will lose \$34.

If you take fewer than that, you will receive a reward:

1    \$17

2    \$16

3    \$15

...

16   \$2

17   \$0

Can you guess what number I'm thinking of? 75000

Your guess was too high. Try again!

Can you guess what number I'm thinking of? 40000

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 55000

Your guess was too high. Try again!

Can you guess what number I'm thinking of? 50000

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52500

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 53500

Your guess was too high. Try again!

Can you guess what number I'm thinking of? 53000

Your guess was too high. Try again!

Can you guess what number I'm thinking of? 52750

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52800

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52900

Your guess was too high. Try again!

Can you guess what number I'm thinking of? 52850

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52875

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52890

Your guess was too high. Try again!

Can you guess what number I'm thinking of? 52885

Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52888  
Your guess was too high. Try again!

Can you guess what number I'm thinking of? 52886  
Your guess was too low. Try again!

Can you guess what number I'm thinking of? 52887  
Your guess was correct!  
You guessed the number in 17 guesses!  
You won \$0 this round  
You have -\$10 so far

Would you like to play another round (y/n)? n