

## Homework 1

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### Question 1:

Write a program that inputs a single letter and prints out the corresponding digit on the telephone. The letters and digits on a telephone are grouped this way:

2 = ABC 4 = GHI 6 = MNO 8 = TUV

3 = DEF 5 = JKL 7 = PRS 9 = WXY

No digit corresponds to either Q or Z. For these two letters, your program should print a message indicating that they are not used on a telephone.

The program might operate like this:

```
Enter a single letter, and I will tell you what the corresponding
digit is on the telephone.
```

```
R
```

```
The digit 7 corresponds to the letter R on the telephone.
```

Here's another example:

```
Enter a single letter, and I will tell you what the corresponding
digit is on the telephone.
```

```
Q
```

```
There is no digit on the telephone that corresponds to Q.
```

Your program should print message indicating that there is no matching digit for any nonalphabetic character the user enters. Also, the program should recognize only uppercase letters. So, the lowercase letters are invalid characters. Prompt the user with an informative message for the input value, as shown above. The program should echo-print the input letter as part of the output.

### Question 2:

This program is a simple guessing game. The computer is to generate a random number between 1 and 20.

The user is given up to five tries to guess the exact number. After each guess, you are to tell the user if the guessed number is greater than, less than, or equal to the random number. If it is equal, no more guesses should be made. If the user hasn't guessed the number after five tries, display the number with a message that the user should know it by now and terminate the game.

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A typical successful dialog might be:

I am think of a number between 1 and 20.

Can you guess what it is? 10

Your guess is low. Try again: 15

Your guess is low. Try again: 17

Your guess is high. Try again: 16

Congratulations! You did it.

A typical successful dialog might be:

I am think of a number between 1 and 20.

Can you guess what it is? 5

Your guess is low. Try again: 20

Your guess is high. Try again: 10

Your guess is low. Try again: 18

Your guess is high. Try again: 12

Sorry. The number was 15.

You should have gotten it by now.

Better luck next time.

You design for this program should include a separate method to get the user's guess, a function to print the unsuccessful message, one to print the successful message, and one to print the sorry message.

## Question 3:

A palindrome is a number or a text phrase that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a program that reads in a five-digit integer and determines whether or not it is a palindrome. [Hint: Use the division and remainder operators to separate the number into its individual digits.]