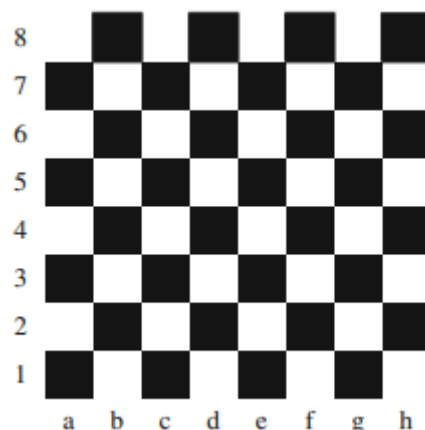


1. **Dog Years:** It is commonly said that one human year is equivalent to 7 dog years. However this simple conversion fails to recognize that dogs reach adulthood in approximately two years. As a result, some people believe that it is better to count each of the first two human years as 10.5 dog years, and then count each additional human year as 4 dog years. Write a program that implements the conversion from human years to dog years described in the previous paragraph. Ensure that your program works correctly for conversions of less than two human years and for conversions of two or more human years. Your program should display an appropriate error message if the user enters a negative number.
2. **Sound Levels:** The following table lists the sound level in decibels for several common noises.

Noise	Decibel level (dB)
Jackhammer	130
Gas lawnmower	103
Alarm clock	70
Quiet room	40

Write a program that reads a sound level in decibels from the user. If the user enters a decibel level that matches one of the noises in the table then your program should display a message containing only that noise. If the user enters a number of decibels between the noises listed then your program should display a message indicating which noises the level is between. Ensure that your program also generates reasonable output for a value smaller than the quietest noise in the table, and for a value larger than the loudest noise in the table.

3. **What Color is that Square?:** Positions on a chess board are identified by a letter and a number. The letter identifies the column, while the number identifies the row, as shown below:



Write a program that reads a position from the user. Use an if statement to determine if the column begins with a black square or a white square. Then use modular arithmetic to report the color of the square in that row. For example, if the user enters a1 then your program should report that the square is black. If the user enters d5 then your program should report that the square is white. Your program may assume that a valid position will always be entered. It does not need to perform any error checking.

4. **Chinese Zodiac:** The Chinese zodiac assigns animals to years in a 12 year cycle. One 12 year cycle is shown in the table below. The pattern repeats from there, with 2012 being another year of the dragon, and 1999 being another year of the hare.

Year	Animal
2000	Dragon
2001	Snake
2002	Horse
2003	Sheep
2004	Monkey
2005	Rooster
2006	Dog
2007	Pig
2008	Rat
2009	Ox
2010	Tiger
2011	Hare

Write a program that reads a year from the user and displays the animal associated with that year. Your program should work correctly for any year greater than or equal to zero, not just the ones listed in the table.

5. **Letter Grade to Grade Points:** At a particular university, letter grades are mapped to grade points in the following manner:

Letter	Grade points
A+	4.0
A	4.0
A–	3.7
B+	3.3
B	3.0
B–	2.7
C+	2.3
C	2.0
C–	1.7
D+	1.3
D	1.0
F	0

Write a program that begins by reading a letter grade from the user. Then your program should compute and display the equivalent number of grade points. Ensure that your program generates an appropriate error message if the user enters an invalid letter grade.

6. **Grade Points to Letter Grade:** In the previous exercise you created a program that converts a letter grade into the equivalent number of grade points. In this exercise you will create a program that reverses the process and converts from a grade point value entered by the user to a letter grade. Ensure that your program handles grade point values that fall between letter grades. These should be rounded to the closest letter grade. Your program should report A+ for a 4.0 (or greater) grade point average.
7. **Cell Phone Bill:** A particular cell phone plan includes 50 minutes of air time and 50 text messages for \$15.00 a month. Each additional minute of air time costs \$0.25, while additional text messages cost \$0.15 each. All cell phone bills include an additional charge of \$0.44 to support 911 call centers, and the entire bill (including the 911 charge) is subject to 5 percent sales tax. Write a program that reads the number of minutes and text messages used in a month from the user. Display the base charge, additional minutes charge (if any), additional text message charge (if any), the 911 fee, tax and total bill amount. Only display the additional minute and text message charges if the user incurred costs in these categories. Ensure that all of the charges are displayed using 2 decimal places.

8. **Roulette Payouts:** A roulette wheel has 38 spaces on it. Of these spaces, 18 are black, 18 are red, and two are green. The green spaces are numbered 0 and 00. The red spaces are numbered 1, 3, 5, 7, 9, 12, 14, 16, 18, 19, 21, 23, 25, 27, 30, 32, 34 and 36. The remaining integers between 1 and 36 are used to number the black spaces. Many different bets can be placed in roulette. We will only consider the following subset of them in this exercise:

1. Single number (1 to 36, 0, or 00)
2. Red versus Black
3. Odd versus Even (Note that 0 and 00 do not pay out for even)
4. 1 to 18 versus 19 to 36

Write a program that simulates a spin of a roulette wheel by using *Python's random number generator* or read it from the user. Display the number that was selected and all of the bets that must be payed. For example, if 13 is selected then your program should display:

- The spin resulted in 13...
- Pay 13
- Pay Black
- Pay Odd
- Pay 1 to 18

If the simulation results in 0 or 00 then your program should display Pay 0 or Pay 00 without any further output.