Introduction to Programming Using Python 1st edition Schneider Solutions Manual

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Answers

CHAPTER 2

EXERCISES 2.1

1. 12 **2.** 49 **3.** .125 **4.** **23** **5.** 8 **6.** -96 **7.** 2 **8.** 2

9. 1 **10.** 3 **11.** 1 **12.** 0 **13.** Not valid **14.** Not valid

15. Valid **16.** Not valid **17.** Not valid **18.** Not valid **19.** 10

20. 14 **21.** 16 **22.** 16 **23.** 9 **24.** 8

25.
```
print((7 * 8) + 5)
```

26.
```
(1 + (2 * 9)) **3
```

27.
```
print(.055 * 20)
```

28.
```
15 - (3 * (2 + (3 ** 4)))
```

29.
```
print(17 * (3 + 162))
```

30.
```
(4 + (1 / 2)) - (3 + (5 / 8))
```

31.

	x	y
`x = 2`	2	does not exist
`y = 3 * x`	2	6
`x = y + 5`	11	6
`print(x + 4)`	11	6
`y = y + 1`	11	7

32.

	bal	inter	withDr
`bal = 100`	100	does not exist	does not exist
`inter = .05`	100	.05	does not exist
`withDr = 25`	100	.05	25
`bal += (inter * bal)`	105	.05	25
`bal = bal - withDr`	80	.05	

33. `24` **34.** `1 8 9` **35.** `10` **36.** `225`

37. `2 15` **38.** `5 10` **39.** The third line should read `c = a + b`.

40. 1,234 should not contain a comma; $100 should not have a dollar sign; Deposit should begin with a lowercase letter d.

41. The first line should read `interest = 0.05`. **43.** 10 **45.** 7 **47.** 3.128

49. -2 50. 2 **51.** 0 52. 1 **53.** 6 54. 1

55. `cost += 5` **56.** `sum *= 2` **57.** `cost /= 6` **58.** `sum -= 7`

59. `sum %= 2` **60.** `cost //= 3`

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61.
```
revenue = 98456
costs = 45000
profit = revenue - costs
print(profit)
```

62.
```
costPerShare = 25.625
numberOfShares = 400
amount = costPerShare * numberOfShares
print(amount)
```

63.
```
price = 19.95
discountPercent = 30
markdown = (discountPercent / 100) * price
price -= markdown
print(round(price, 2))
```

64.
```
fixedCosts = 5000
pricePerUnit = 8
costPerUnit = 6
breakEvenPoint = fixedCosts / (pricePerUnit - costPerUnit)
print(breakEvenPoint)
```

65.
```
balance = 100
balance += 0.05 * balance
balance += 0.05 * balance
balance += 0.05 * balance
print(round(balance, 2))
```

66.
```
balance = 100
balance = ((1.05) * balance) + 100
balance = ((1.05) * balance) + 100
balance *= 1.05
print(round(balance, 2))
```

67.
```
balance = 100
balance *= 1.05 ** 10
print(round(balance, 2))
```

68.
```
purchasePrice = 10
sellingPrice = 15
percentProfit = 100 * ((sellingPrice - purchasePrice) / purchasePrice)
print(percentProfit)
```

69.
```
tonsPerAcre = 18
acres = 30
totalTonsProduced = tonsPerAcre * acres
print(totalTonsProduced)
```

70.
```
initialVelocity = 50
initialHeight = 5
t = 3
height = (-16 * (t ** 2)) + (initialVelocity * t) + initialHeight
print(height)
```

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```
71. distance = 233
    elapsedTime = 7 - 2
    averageSpeed = distance / elapsedTime
    print(averageSpeed)

72. miles = 23695 - 23352
    gallonsUsed = 14
    milesPerGallon = miles / gallonsUsed
    print(milesPerGallon)

73. gallonsPerPersonDaily = 1600
    numberOfPeople = 315000000
    numberOfDays = 365
    gallonsPerYear = gallonsPerPersonDaily * numberOfPeople * numberOfDays
    print(gallonsPerYear)

74. pizzasPerSecond = 350
    secondsInDay = 60 * 60 * 24
    numPerDay = pizzasPerSecond * secondsInDay
    print(numPerDay))

75. numberOfPizzarias = 70000
    percentage = .12
    numberOfRestaurants = numberOfPizzarias / percentage
    print(round(numberOfRestaurants))

76. pop2000 = 281
    pop2050 = 404
    percentGrowth = round(100 * ((pop2050 - pop2000) / pop2000))
    print(round(percentGrowth))

77. nationalDebt = 1.68e+13
    population = 3.1588e+8
    perCapitaDebt = nationalDebt / population
    print(round(perCapitaDebt))

78. cubicFeet = (5280 ** 3)
    caloriesPercubicFoot = 48600
    totalNumberOfCalories = cubicFeet * caloriesPercubicFoot
    print(totalNumberOfCalories))
```

EXERCISES 2.2

```
1. Python   2. Hello    3. Ernie    4. Bert     5. "o"          6. "o"

7. "h"      8. "n"      9. "Pyt"    10. []      11. "Py"        12. "Thon"

13. "h"     14. "ytho"  15. "th"    16. "th"    17. "Python"    19. 2

20. -1      21. -1      23. 10      24. 3       25. 2           26. 5

27. -1      28. -1      29. 3       30. "BRRR"  31. 8 ball      32. 4

33. "8 BALL"            35. "hon"   37. "The Artist"            39. 5
```

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40. `"King Lear"` 41. `7` 42. `6` 43. `2` 45. `"King Kong"`

46. `1` 47.
```
12
MUNICIPALITY
City
6
```
48.
```
9
Microsoft
os
5
```

49. `flute` 50. `Acute` 51. `Your age is 21.` 52. `Fred has 2 children.`

53. `A ROSE IS A ROSE IS A ROSE` 54. `PYTHON` 55. `WALLAWALLA`

56. `murmur` 57. `goodbye` 58. `eighth` 59. `Mmmmmmm.`

60. `***YES***` 61. `a b` 62. `spamspamspamspam`

63. `76 trombones` 64. `5.5` 65. `17` 66. `8` 67. `8` 68. `8`

69. `The Great 9` 70. `The Dynamic Duo` 71. `s[:-1]` 72. `s[2:]`

73. `-8` 74. `7` 75. True 76. True 77. True 78. True

79. `234-5678` should be surrounded with quotation marks.

80. `I came to Casablanca for the waters.` should be surrounded by quotation marks.

81. *for* is a reserved word and cannot be used as a variable name.

82. A string cannot be concatenated with a number. The second line should be written
```
print("Age: " + str(age))
```

83. The string should be replaced with `"Say it ain't so."`

84. Should be written `print('George "Babe" Ruth')`

85. `Upper` should be changed to `upper`.

86. `lower` should be changed to `lower()`

87. A string cannot be concatenated with a number.

88. The characters in a number cannot be indexed.

89. *find* is a not an allowable method for a number; only for a string.

90. The `len` function can not be applied to numbers.

91. The string "Python" does not have a character of index 8.

92. `show[9]` is not valid since the string "Spamalot" does not have a character of index 9.

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```
93. ## Display an inventor's name and year of birth.
    firstName = "Thomas"
    middleName = "Alva"
    lastName = "Edison"
    yearOfBirth = 1847
    print(firstName,  middleName, lastName + ',', yearOfBirth)

94. item = "ketchup"
    regularPrice = 1.8
    discount = 0.27
    print(regularPrice - discount) + " is the sale price of " + item + "."

95. ## Display a copyright statement.
    publisher = "Pearson"
    print("(c)", publisher)

96. prefix = "Fore"
    print(prefix + "warned is " + prefix + "armed.")

97. ## Calculate the distance from a storm.
    prompt = "Enter number of seconds between lightning and thunder: "
    numberOfSeconds = float(input(prompt))
    distance = numberOfSeconds / 5
    distance = round(distance, 2)
    print("Distance from storm:", distance, "miles.")
```

```
Enter number of seconds between lightning and thunder: 1.25
Distance from storm: 0.25 miles.
```

```
98. ## Calculate training heart rate.
    age = float(input("Enter your age: "))
    rhr = int(input("Enter your resting heart rate: "))
    thr = .7 * (220 - age) + (.3 * rhr)
    print("Training heart rate:", round(thr), "beats/minute.")
```

```
Enter your age: 20
Enter your resting heart rate: 70
Training heart rate: 161 beats/min.
```

```
99. ## Calculate weight loss during a triathlon.
    cycling = float(input("Enter number of hours cycling: "))
    running = float(input("Enter number of hours running: "))
    swimming = float(input("Enter number of hours swimming: "))
    pounds = (200 * cycling + 475 * running + 275 * swimming) / 3500
    pounds =round(pounds, 1)
    print("Weight loss:", pounds, "pounds")
```

```
Enter number of hours cycling: 2
Enter number of hours running: 3
Enter number of hours swimming: 1
Weight loss: 0.6 pounds
```

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100.
```
## Calculate cost of electricity.
wattage = int(input("Enter wattage: "))
hoursUsed = float(input("Enter number of hours used: "))
price = float(input("Enter price per kWh in cents: "))
cost = (wattage * hoursUsed) / (1000 * price)
print("Cost of electricity:", '$' + str(round(cost, 2)))
```

```
Enter wattage: 100
Enter number of hours used: 720
Enter price per kWh in cents: 11.76
Cost of electricity: $6.12
```

101.
```
## Calculate percentage of games won by a baseball team.
name = input("Enter name of team: ")
gamesWon = int(input("Enter number of games won: "))
gamesList = int(input("Enter number of games lost: "))
percentageWon = round(100 * (gamesWon) / (gamesWon + gamesList), 1)
print(name, "won", str(percentageWon) + '%', "of their games.")
```

```
Enter name of team: Yankees
Enter number of games won: 68
Enter number of games lost: 52
Yankees won 56.7% of their games.
```

102.
```
## Calculate price/earnings ratio.
earningsPerShare = float(input("Enter earnings per share: "))
pricePerShare = float(input("Enter price per share: "))
PEratio = pricePerShare / earningsPerShare
print("Price-to-Earnings ratio:", PEratio)
```

```
Enter earnings per share: 5.25
Enter price per share: 68.25
Price-to-Earnings ratio: 13.0
```

103.
```
## Determine the speed of a skidding car.
distance = float(input("Enter distance skidded (in feet): "))
speed = (24 * distance) ** .5
speed = round(speed, 2)
print("Estimated speed:", speed, "miles per hour")
```

```
Enter distance skidded: 54
Estimated speed: 36.0 miles per hour
```

104.
```
## Convert a percent to a decimal.
percentage = input("Enter percentage: ")
percent = float(percentage[:-1]) / 100
print("Equivalent decimal:", percent)
```

```
Enter percentage: 125%
Equivalent decimal: 1.25
```

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105.
```
## Convert speed from kph to mph.
speedInKPH = float(input("Enter speed in KPH: "))
speedInMPH = speedInKPH * .6214
print("Speed in MPH:", round(speedInMPH, 2))
```

```
Enter speed in KPH: 112.6541
Speed in MPH: 70.00
```

Note: The world's fastest animal, the cheetah, can run at the speed of 112.6541 kilometers per hour.

106.
```
## Server's tip.
bill = float(input("Enter amount of  bill: "))
percentage = float(input("Enter percentage tip: "))
tip = (bill * percentage) / 100
print("Tip:", '$' + str(round(tip, 2)))
```

```
Enter amount of bill: 21.50
Enter percentage tip: 18
Tip: $3.87
```

107.
```
## Calculate equivalent CD interest rate for municipal bond rate.
taxBracket = float(input("Enter tax bracket (as decimal): "))
bondRate = float(input("Enter municipal bond interest rate (as %): "))
equivCDrate = bondRate / (1 - taxBracket)
print("Equivalent CD interest rate:", str(round(equivCDrate, 3)) + '%')
```

```
Enter tax bracket (as decimal): .37
Enter municipal bond interest rate (as %): 3.26
Equivalent CD interest rate: 5.175%
```

108.
```
## Marketing terms.
purchasePrice = float(input("Enter purchase price: "))
sellingPrice = float(input("Enter selling price: "))
markup = sellingPrice - purchasePrice
percentageMarkup = 100 * (markup / purchasePrice)
profitMargin = 100 * (markup / sellingPrice)
print("Markup:", '$' + str(round(markup, 2)))
print("Percentage markup:", str(round(percentageMarkup, 2)) + '%')
print("Profit margin:", str(round(profitMargin, 2)) + '%')
```

```
Enter purchase price: 215
Enter selling price: 645
Markup: $430.0
Percentage markup: 200.0%
Profit margin: 66.67%
```

109.
```
## Analyze a number.
number = input("Enter number: ")
decimalPoint = number.find('.')
print(decimalPoint, "digits to left of decimal point")
print(len(number) - decimalPoint - 1, "digits to right of decimal point")
```

```
Enter number: 76.543
2 digits to left of decimal point
3 digits to right of decimal point
```

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110.
```
## Word replacement.
sentence = input("Enter a sentence: ")
word1 = input("Enter word to replace: ")
word2 = input("Enter replacement word: ")
location = sentence.find(word1)
newSentence = sentence[:location] + word2 + sentence[location + len(word1):]
print(newSentence)
```

```
Enter a sentence: Live long and prosper.
Enter word to replace: prosper
Enter replacement word: proper
Live long and proper.
```

111.
```
## Convert a number of months to years and months.
numberOfMonths = int(input("Enter number of months: "))
years = numberOfMonths // 12
months = numberOfMonths % 12
print(numberOfMonths, "months is", years, "years and", months, "months.")
```

```
Enter number of months: 234
234 months is 19 years and 6
```

112.
```
## Convert lengths.
numberOfInches = int(input("Enter number of inches: "))
feet = numberOfInches // 12
inches = numberOfInches % 12
print(numberOfInches, "inches equals", feet, "feet and", inches, "inches.")
```

```
Enter number of inches: 185
185 inches is 15 feet and 5 inches.
```

EXERCISES 2.3

1.
```
Bon Voyage!
```

2.
```
Price: $23.45
```

3.
```
Portion: 90%
```

4.
```
Python
```

5.
```
1 x 2 x 3
```

6.
```
tic-tac-toe
```

7.
```
father-in-law
```

8.
```
father-in-law
```

9.
```
T-shirt
```

10.
```
spam and eggs
```

11.
```
Python
```

12.
```
on-site repair
```

13.
```
Hello
World!
```

14.
```
Hello
World!
```

15.
```
One     Two     Three    Four
```

16.
```
1       2       3
Detroit Lions
Indianapolis    Colts
```

17.
```
NUMBER  SQUARE
2       4
3       9
```

18.
```
COUNTRY LAND AREA
India   2.5 million sq km
China   9.6 million sq km
```

19.
```
Hello           World!
Hello           World!
```

20.
```
STATE          CAPITAL
North Dakota   Bismarck
South Dakota   Pierre
```

21.
```
01234567890
          A  B  C
```

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```
22. 0123456789012345     23. 01234567890123456   24. 01234567890
      one  two  three          one  two  three          A  B  C

25. 0123456789     26. 0123456789
       12.30%              1,234
      123.0%             1,234
    1,230.00%          1,234

27. $1,234.57      28. 1,234         29. 1       30. #1,234.00

31. Language  Native speakers  % of World Pop.
    Mandarin    935,000,000       14.10%
    Spanish     387,000,000        5.85%
    English     365,000,000        5.52%

32. Major         Percent of Students
    Biology             6.2%
    Psychology          5.4%
    Nursing             4.7%

33. Be yourself - everyone else is taken.

34. Plan first, code later

35. Always look on the bright side of life.

36. And now for something completely different.

37. The product of 3 and 4 is 12.

38. The chances of winning the Powerball Lottery are 1 in 175,223,510.

39. The square root of 2 is about 1.4142.

40. Pi is approximately 3.14159.

41. In a randomly selected group of 23 people, the probability
    is 0.51 that 2 people have the same birthday.

42. The cost of Alaska was about $10.86 per square mile.

43. You miss 100% of the shots you never take. - Wayne Gretsky

44. 12% of the members of the U.S. Senate are from New England.

45. 22.28% of the UN nations are in Europe.

46. The area of Alaska is 17.5% of the area of the U.S.

47. abracadabra

48. When you have nothing to say, say nothing.

49. Be kind whenever possible. It is always possible. - Dalai Lama

50. If you can dream it, you can do it. - Walt Disney
```

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51. Yes **52.** Yes

53.
```
## Calculate a server's tip.
bill = float(input("Enter amount of bill: "))
percentage = float(input("Enter percentage tip: "))
tip = (bill * percentage) / 100
print("Tip: ${0:.2f}".format(tip))
```

```
Enter amount of bill: 45.50
Enter percentage tip: 20
Tip: $9.10
```

54.
```
## Calculate income.
revenue = eval(input("Enter revenue: "))
expenses = eval(input("Enter expenses: "))
netIncome = revenue - expenses
print("Net income: ${0:,.2f}".format(netIncome))
```

```
Enter revenue: 550000
Enter expenses: 410000
Net income: $140,000.00
```

55.
```
## Calculate a new salary.
beginningSalary = float(input("Enter beginning salary: "))
raisedSalary = 1.1 * beginningSalary
cutSalary = .9 * raisedSalary
percentChange = (cutSalary - beginningSalary) / beginningSalary
print("New salary: ${0:,.2f}".format(cutSalary))
print("Change: {0:.2%}".format(percentChange))
```

```
Enter beginning salary: 42500
New salary: $42,075.00
Change: -1.00%
```

56.
```
## Calculte a change in salary.
beginningSalary = float(input("Enter beginning salary: "))
raisedSalary = 1.05 * 1.05 * 1.05 * beginningSalary
percentChange = (raisedSalary - beginningSalary) / beginningSalary
print("New salary: ${0:,.2f}".format(raisedSalary))
print("Change: {0:.2%}".format(percentChange))
```

```
Enter beginning salary: 35000
New salary: $40,516.88
Change: 15.76%
```

57.
```
## Calculate a future value.
p = float(input("Enter principal: "))
r = float(input("Enter interest rate (as %): "))
n = int(input("Enter number of years: "))
futureValue = p * (1 + (r / 100)) ** n
print("Future value: ${0:,.2f}".format(futureValue))
```

```
Enter principal: 2500
Enter interest rate (as %): 3.5
Enter number of years: 2
Future value: $2,678.06
```

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```
58. ## Calculate a present value.
    f = float(input("Enter future value: "))
    r = float(input("Enter interest rate (as %): "))
    n = int(input("Enter number of years: "))
    presentValue = f / ((1 + (r / 100)) ** n)
    print("Present value: ${0:,.2f}".format(presentValue))
```

```
Enter future value: 10000
Enter interest rate (as %): 4
Enter number of years: 6
Present value: $7,903.15
```

EXERCISES 2.4

```
1. Pennsylvania Hawaii          2. New Jersey, Arizona          3. Alaska Hawaii

4. 50          5. Delaware Delaware     6. 0          7. 48          8. 22

9. Ohio        10. Hawaii Hawaii          11. DELAWARE        12. Puerto Rico

13. ['Puerto Rico']        14. Georgia          15. United States          16. 48

17. ['New Jersey', 'Georgia', 'Connecticut']

18. ['Pennsylvania', 'New Jersey', 'Georgia']

19. ['Oklahoma', 'New Mexico', 'Arizona']

20. ['New Mexico', 'Arizona', 'Alaska']

21. ['Delaware', 'Pennsylvania', 'New Jersey', 'Georgia']

22. ['Delaware']    23. ['Arizona', 'Alaska', 'Hawaii']

24. ['Alaska', 'Hawaii']          25. []          26. []          27. Georgia

28. Arizona          29. ['Alaska', 'Hawaii']          30. Massachusetts

31. New Mexico      32. New Jersey     33. 10          34. 30          35. 0          36. 50

37. 48          38. 46          39. ['Hawaii', 'Puerto Rico', 'Guam']

40. ['Alaska', 'Hawaii', ['Puerto Rico', 'Guam']]

41. ['Hawaii', 'Puerto Rico', 'Guam']

42. ['Arizona', "Seward's Folly", 'Hawaii']

43. ['Delaware', 'Commonwealth of Pennsylvania', 'New Jersey']

44. ['Delaware', 'Commonwealth of Pennsylvania', 'Pennsylvania']

45. ['New', 'Mexico']          46. ['Jersey', 'New', 'Mexico']
    ['New', 'Jersey']
```

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47. Pennsylvania,New Jersey,Georgia 48. ['Jersey', 'New', 'Mexico']

49. 8 50. 8 51. 100 52. 7 53. 0 54. 98

55. Largest Number: 8 56. Smallest Number: 0 57. Total: 16

58. Average 4.0

59.
```
This sentence contains five words.
This sentence contains six different words.
```

60. ['all', 'for', 'one'] 61. Babbage, Charles 62. Guido Rossum

63. Middle Name: van 64. Python 65. When in the course of human events

66. Less is more. 67. editor-in-chief 68. merry-go-round

69. e**pluribus**unum 70. ['around', 'the', 'clock']

71. ['New York', 'NY', 'Empire State', 'Albany']

72. ['France', 'England', 'Spain'] 73. ['France', 'England', 'Spain']

74. a bcd 75. programmer

76. Live let live. 77. Follow your own star.

78.
```
Largest Number: 8
Length: 4
Total: 16
Number list: [6, 2, 8, 0]
```

79. 987-654-3219 80. Dairy 81. [3, 9, 6] 82. (-5, 17, 123)

83. each 84. (0, 2, 3) 85. ['soprano', 'tenor', 'alto', 'bass']

86. ['soprano', 'tenor', 'alto', 'bass'] 87. ['gold', 'silver', 'bronze']

88. ['gold', 'silver', 'bronze'] 89. murmur

90. [0, 0, 0, 0] 91. ('Happy', 'Sneezy', 'Bashful')

92. ['Nina', 'Pinta'] 93. 1 94. 2

95. Index out of range. The list does not have an item of index 3.

96. The statement `word[1] = 'p'` is not valid since strings are immutable.

97. The join method only can be applied to a list consisting entirely of strings.

98. The tuple does not have an item of index 4.

99. The second line is not valid. Items in a tuple cannot be reassigned values directly.

100. Tuples do not support the *append* method.

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```
101. ## Count the number of words in a sentence.
     sentence = input("Enter a sentence: ")
     L = sentence.split(" ")
     print("Number of words:", len(L))
```

```
Enter a sentence: This sentence contains five words.
Number of words: 5
```

```
102. ## Analyze a sentence
     sentence = input("Enter a sentence: ")
     L = sentence.split()
     print("First word:", L[0])
     print("Last word:", L[-1][:-1])
```

```
Enter a sentence: Reach for the stars.
First word: Reach
Last word: stars
```

```
103. ## Display a name.
     name = input("Enter a 2-part name: ")
     L = name.split()
     print("{0:s}, {1:s}".format(L[1], L[0]))
```

```
Enter a 2-part name: Charles Babbage
Revised form: Babbage, Charles
```

```
104. ## Extract the middle name from a three-part name.
     name = input("Enter a 3-part Name: ")
     L = name.split()
     print("Middle Name:", L[1])
```

```
Enter a 3-part name: Augusta Ada Byron
Middle name: Ada
```

PROGRAMMING PROJECTS CHAPTER 2

```
1. ## Make change for an amount of less than one dollar.
   amount = int(input("Enter amount of change: "))
   remainder = amount
   quarters = remainder // 25
   remainder %= 25
   dimes = remainder // 10
   remainder %= 10
   nickels = remainder // 5
   remainder %= 5
   cents = remainder
   print("Quarters:", quarters, end="   ")
   print("\tDimes:", dimes)
   print("Nickels:", nickels, end="   ")
   print("\tCents:", cents)
```

```
Enter amount of change: 93
Quarters: 3       Dimes: 1
Nickels: 1        Cents: 3
```

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2.
```
## Determine the monthly payment for a car loan.
loanAmount = float(input("Enter amount of loan: "))
interestRate = float(input("Enter interest rate (%): "))
numYears = float(input("Enter number of years: "))
i = interestRate / 1200
monthlyPayment = (i / (1 - ((1 + i) ** (-12 * numYears)))) * loanAmount
print("Monthly payment: ${0:,.2f}".format(monthlyPayment))
```

```
Enter amount of loan: 12000
Enter interest rate (%): 6.4
Enter number of years: 5
Monthly payment: $234.23
```

3.
```
faceValue = float(input("Enter face value of bond: "))
couponRate = float(input("Enter coupon interest rate: "))
interest = faceValue * couponRate
marketPrice = float(input("Enter current market price: "))
yrsUntilMaturity = float(input("Enter years until maturity: "))
a = (faceValue - marketPrice) / yrsUntilMaturity
b = (faceValue + marketPrice) / 2
ytm = (interest + a) / b
print("Approximate YTM: {0:.2%}".format(ytm))
```

```
Enter face value of bond: 1000
Enter coupon interest rate: .04
Enter current market price: 1180
Enter years until maturity: 15
Approximate YTM: 2.57%
```

4.
```
## Determine the unit price of a purchase.
price = float(input("Enter price of item: "))
print("Enter weight of item in pounds and ounces separately.")
pounds = float(input("Enter pounds: "))
ounces = float(input("Enter ounces: "))
weightInOunces = 16 * pounds + ounces
pricePerOunce = price / weightInOunces
print("Price per ounce: ${0:.2f}".format(pricePerOunce))
```

```
Enter price of item: 25.50
Enter weight of item in pounds and ounces separately.
Enter pounds: 1
Enter ounces: 9
Price per ounce: $1.02
```

5.
```
## Describe the distribution in a stock portfolio.
spy = float(input("Enter amount invested in SPY: "))
qqq = float(input("Enter amount invested in QQQ: "))
eem = float(input("Enter amount invested in EEM: "))
vxx = float(input("Enter amount invested in VXX: "))
total = spy + qqq + eem + vxx
print()
print("{0:6s}{1:>12s}".format("ETF", "PERCENTAGE"))
print("-" * 18)
```

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```
print("{0:6s}{1:10.2%}".format("SPY", spy / total))
print("{0:6s}{1:10.2%}".format("QQQ", qqq / total))
print("{0:6s}{1:10.2%}".format("EEM", eem / total))
print("{0:6s}{1:10.2%}".format("VXX", vxx / total))
print()
print("{0:s}: ${1:,.2f}".format("TOTAL AMOUNT INVESTED", total))
```

```
Enter amount invested in SPY: 876543.21
Enter amount invested in QQQ: 234567.89
Enter amount invested in EEM: 345678.90
Enter amount invested in VXX: 123456.78

ETF     PERCENTAGE
------------------
SPY        55.47%
QQQ        14.84%
EEM        21.87%
VXX         7.81%

TOTAL AMOUNT INVESTED: $1,580,246.78
```

6.
```
## Convert a measurement from miles, yards, feet,
## and inches, to a metric one in meters, kilometers,
## and centimeters.
miles = float(input("Enter number of miles: "))
yards = float(input("Enter number of yards: "))
feet = float(input("Enter number of feet: "))
inches = float(input("Enter number of inches: "))
# Step #1: Add up given measurements into inches
totalInches = inches + 12 * feet + 36 * yards + 63360 * miles
# Step #2: Convert total inches into total meters
totalMeters = totalInches / 39.3700787
# Step #3: Compute kilometers, whole meters, and centimeters
# Step 3a: compute # of kilometers, subtract from meters
kilometers = int(totalMeters / 1000)
totalMeters = totalMeters - 1000 * kilometers
meters = int(totalMeters)
centimeters = 100 * (totalMeters - meters)
centimeters = round(centimeters, 1)
print("Metric length:")
print(" ", kilometers, "kilometers")
print(" ", meters, "meters")
print(" ", centimeters, "centimeters")
```

```
Enter number of miles: 5
Enter number of yards: 20
Enter number of feet: 2
Enter number of inches: 4
Metric length:
  8 kilometers
  65 meters
  73.5 centimeters
```

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