

COMPUTER PROGRAMMING HOMEWORK ASSIGNMENT

This assignment consists of a series of five exercises, each worth 20 points, that can be solved by writing a computer program. For each exercise, design an algorithm using a series of comments and then implement the program using the Ruby language. The assignments are in random order and not order of difficulty.

Use RubyMine to create a project named [Asg7](#) and, for each problem, add a file to the project named [Asg7Exn.rb](#), where *n* is the exercise number. For example, the filename of the first exercise should be [Asg7Ex1.rb](#).

Within each file, add a comment block at the top that contains the program's name, our name, the date, the course title, your instructor's name, the assignment number, the exercise number, and a brief description of the program's purpose.

Problem #1

You have been asked to write a simple menu driven calculator which allows addition, subtraction, and multiplication of a number. The user will begin by entering a beginning total. They can then add to the number, subtract from the number, multiply by the number, or exit the program. Based on their response if they do not exit the user is prompted to enter a value. The value will then be added, subtracted or multiplied by the current total creating a new total. The program must then loop and allow the user to select another option from the menu. This will continue until the user enters an option to exit the menu. When they exit the final total must be displayed. You also need to account for the user entering invalid input in the menu.

Here is sample code showing how to create a menu which should help with your own code:

```
# How to create a menu
```

```
puts
```

```
puts ' Menu Title' puts
```

```
puts ' a. Option 1' puts ' b. Option 2' puts ' c. Option 3' puts ' X. To exit' puts
```

```
print ' Enter your selection: ' choice = gets.downcase.chomp while choice != 'x'
```

```
# Add code for various selections
```

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```
puts
```

```
puts ' Menu Title'
```

```
puts
```

```
puts ' a. Option 1'
```

```
puts ' b. Option 2'
```

```
puts ' c. Option 3'
```

```
puts ' X. To exit'
```

```
puts
```

```
print ' Enter your selection: 'choice = gets.downcase.chomp
```

```
end
```

Here is a sample of the program running.

Enter the beginning value for the calculator: 200 Simple Calculator

a. Add to total

b. Subtract from total c. Multiply total

X. To exit

Enter your selection: a

Enter value to add to total: 300

_____ Current total: 500.0

Simple Calculator

a. Add to total

b. Subtract from total c. Multiply total

X. To exit

Enter your selection: b

Enter value to subtract from total: 70

_____ Current total: 430.0

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Simple Calculator

a. Add to total

b. Subtract from total c. Multiply total

X. To exit

Enter your selection: c

Enter value to multiply by the total: 2

Current total: 860.0 _____

Simple Calculator

a. Add to total

b. Subtract from total c. Multiply total

X. To exit

Enter your selection: d *** Invalid menu option ***

_____ Current total: 860.0

Simple Calculator

a. Add to total

b. Subtract from total c. Multiply total

X. To exit

Enter your selection: x

_____ Final total: 860.0

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Press enter to exit

Process finished with exit code 0

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Problem #2

Tastee Convenience Store needs a menu driven program for selling their limited selection of items. A menu of at least 9 items and their prices will be displayed. The person will enter a number or letter which is associated with an item and its price. There will need to be an option to exit the menu.

At this point each item purchased and its price must be printed out in the same order as they were entered as part of a receipt. The items must print out after they are all entered to receive full credit since this is what forces you to use an array. After this you will display the total price of the items (Subtotal). The tax amount computed with a tax rate of 6%. Finally, it will print the total amount due (Total Price). Your program should match the sample output below. You may use different items and prices or add additional items and prices. Do not worry about rounding the numbers.

Tips: You want to utilize an array to track each item ordered in a loop. After all items are entered you can then go through the array and look at the item order and print out the name and price of each item along with accumulating the subtotal based on the item purchased.

As with most if not all programs there are many ways you can write this program. You do not need to use my suggestions but the program must be able to allow the user to purchase at least 200 items, so you will want to use an array.

Since you will need to use floats for this program when entering a number such as fifty cents, ruby seems to want you to put a 0 in front such as 0.50 when assigning it to a variable.

Sample output:

```
Tastee Convenience Store 1. Fountain Drink 1.00
2. Frozen Drink 1.50
3. Candy Bar 1.00

4. Chips .50
5. Hamburger
6. Cheeseburger 2.50
2.00
7. Hot Dog
8. Chili Dog 2.00 9. Pop Corn .50 0. Exit and print receipt
```

1.50

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Enter your selection: 2

Tastee Convenience Store 1. Fountain Drink 1.00

2. Frozen Drink

3. Candy Bar

4. Chips .50

1.50 1.00

5. Hamburger

6. Cheeseburger 2.50

2.00

7. Hot Dog

8. Chili Dog 2.00

1.50

9. Popcorn .50 0. Exit and print receipt

Enter your selection: 2

Tastee Convenience Store 1. Fountain Drink 1.00

2. Frozen Drink

3. Candy Bar

4. Chips .50

1.50 1.00

5. Hamburger

6. Cheeseburger 2.50

2.00

7. Hot Dog

8. Chili Dog 2.00 9. Popcorn .50 0. Exit and print receipt

Enter your selection: 8

Tastee Convenience Store 1. Fountain Drink 1.00

2. Frozen Drink 1.50

1.50

3. Candy Bar 1.00 4. Chips .50

5. Hamburger

6. Cheeseburger 2.50

7. Hot Dog

8. Chili Dog 2.00 9. Popcorn .50

2.00

1.50

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0. Exit and print receipt Enter your selection: 6

Tastee Convenience Store 1. Fountain Drink 1.00

2. Frozen Drink

3. Candy Bar

4. Chips .50

1.50 1.00

5. Hamburger

6. Cheeseburger 2.50

2.00

7. Hot Dog 1.50 8. Chili Dog 2.00 9. Popcorn .50 0. Exit and print receipt

Enter your selection: 7

Tastee Convenience Store 1. Fountain Drink 1.00

2. Frozen Drink

3. Candy Bar

4. Chips .50

1.50 1.00

5. Hamburger

6. Cheeseburger 2.50

2.00

7. Hot Dog

8. Chili Dog 2.00 9. Popcorn .50 0. Exit and print receipt

Enter your selection: 9 Tastee Convenience Store

1.50

1. Fountain Drink 1.00

2. Frozen Drink

3. Candy Bar

4. Chips .50

1.50 1.00

5. Hamburger

6. Cheeseburger 2.50 7. Hot Dog 1.50

2.00

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8. Chili Dog 2.00 9. Popcorn .50 0. Exit and print receipt

Enter your selection: 0

Tastee's Receipt

Frozen Drink 1.50 Frozen Drink 1.50 Chili Dog 2.00

Cheeseburger 2.50 Hot Dog 1.50 Popcorn .50

Subtotal: 9.5 Tax Amount: 0.57 Total Due: 10.07

Process finished with exit code 0

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Problem #3

You have been tasked with creating a multiplication chart for students in a class. The student will enter an integer number then a multiplication chart between 1 and 100 for your number will be printed.

Sample output:

Enter the number you want to use when creating the multiplication table: 5

Multiplication Table for 5 $1*5=5$

$$2 * 5 = 10$$

$$3 * 5 = 15$$

$$4 * 5 = 20$$

$$5 * 5 = 25$$

$$6 * 5 = 30$$

$$7 * 5 = 35$$

$$8 * 5 = 40$$

$$\begin{aligned} 9 * 5 = 45 & \quad 10 * 5 = 50 \quad 11 * 5 = 55 \quad 12 * 5 = 60 \quad 13 * 5 = 65 \quad 14 * 5 = 70 \quad 15 * 5 = 75 \quad 16 * 5 = \\ 80 & \quad 17 * 5 = 85 \quad 18 * 5 = 90 \quad 19 * 5 = 95 \quad 20 * 5 = 100 \quad 21 * 5 = 105 \quad 22 * 5 = 110 \quad 23 * 5 = \\ 115 & \quad 24 * 5 = 120 \quad 25 * 5 = 125 \quad 26 * 5 = 130 \quad 27 * 5 = 135 \quad 28 * 5 = 140 \quad 29 * 5 = 145 \quad 30 * 5 \\ & = 150 \quad 31 * 5 = 155 \end{aligned}$$

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Assignment

$$\begin{aligned} 32 * 5 = 160 & \quad 33 * 5 = 165 \quad 34 * 5 = 170 \quad 35 * 5 = 175 \quad 36 * 5 = 180 \quad 37 * 5 = 185 \quad 38 * 5 = \\ 190 & \quad 39 * 5 = 195 \quad 40 * 5 = 200 \quad 41 * 5 = 205 \quad 42 * 5 = 210 \quad 43 * 5 = 215 \quad 44 * 5 = 220 \quad 45 * 5 \\ & = 225 \quad 46 * 5 = 230 \quad 47 * 5 = 235 \quad 48 * 5 = 240 \quad 49 * 5 = 245 \quad 50 * 5 = 250 \quad 51 * 5 = 255 \quad 52 * \\ & 5 = 260 \quad 53 * 5 = 265 \quad 54 * 5 = 270 \quad 55 * 5 = 275 \quad 56 * 5 = 280 \quad 57 * 5 = 285 \quad 58 * 5 = 290 \quad 59 \end{aligned}$$

* 5 = 295 60 * 5 = 300 61 * 5 = 305 62 * 5 = 310 63 * 5 = 315 64 * 5 = 320 65 * 5 = 325
66 * 5 = 330 67 * 5 = 335 68 * 5 = 340 69 * 5 = 345 70 * 5 = 350 71 * 5 = 355

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Assignment

72 * 5 = 360 73 * 5 = 365 74 * 5 = 370 75 * 5 = 375 76 * 5 = 380 77 * 5 = 385 78 * 5 =
390 79 * 5 = 395 80 * 5 = 400 81 * 5 = 405 82 * 5 = 410 83 * 5 = 415 84 * 5 = 420 85 * 5
= 425 86 * 5 = 430 87 * 5 = 435 88 * 5 = 440 89 * 5 = 445 90 * 5 = 450 91 * 5 = 455 92 *
5 = 460 93 * 5 = 465 94 * 5 = 470 95 * 5 = 475 96 * 5 = 480 97 * 5 = 485 98 * 5 = 490 99
* 5 = 495 100 * 5 = 500

Process finished with exit code 0

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Assignment

Problem #4

Create a program which helps a person calculate the tip for a meal. The person will enter in the entire amount for the bill. The program will then list the amount of the tip if

15%, 20%, or 25%. The bill can be both dollars and cents so be sure to use the correct data type. You do not have to round the bill to the nearest cents, you

can leave it as a long decimal number.

Sample output:

Enter the amount of your meal: 20

Tip amounts 15% = 3.0 20% = 4.0 25% = 5.0

Process finished with exit code 0

Problem #5

Create a program to play heads or tails. Have the user begin by entering their name. Then have the user pick either (h)eads or (t)ails by entering an h or t. The computer will then flip a coin by randomly decide on heads or tails (**Tip: One way to do this is to pick a random integer number between 0 and 1, then assignment heads to one of the numbers and tails to the other**). If the user is correct they score a point and if the user is incorrect the computer scores a point. The computer will keep track of the score and show it each round. The computer will play 5 rounds and at the end display the final score of both the player and the computer. It will also display who won.