***Please read the following instruction very carefully before answering any questions:***

* Please read all the questions very carefully.
* Please provide your answers in the boxes below each question, and do not change the text colour.
* Your answer MUST show the solution procedure. There is no credit if you only state the final answer.
* Please highlight your final answer to each question.
* Please keep the naming conventions requested in this lab and each question.
* Once you complete your lab, rename your word document file to the (**CPAN112\_CostVolumeProfitAnalysis\_BreakEven\_FirstName\_LastName**). Replace FirstName and LastName with your first name and last name, respectively.

*It will be a* ***10%*** *mark deduction if you do not follow the guidelines mentioned above.*

1)To earn some money, John is thinking of starting up a "Back-Yard BBQ" stand at his university campus this summer. The basic "BBQ" equipment will cost $2690, and the variable cost (VC) for each "BBQ Meal" is estimated to be $6.75. He thinks he will be able to sell each "BBQ Meal" for $10.00. [20 points]

a.What is the break-even quantity of "BBQ Meals" for John's "Back-Yard BBQ" stand? [10 points]

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b.If John's goal for profit is $2500 for his fall semester tuition, how many "BBQ Meals" would he need to sell in the summer to reach his goal? [10 points]

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2)Peter is thinking of starting up a "Personal Financial Services" consultation in his spare time. The basic office equipment will cost $2285, and the variable cost (VC) for each consultation is estimated to be $14.60. He plans to bill each client $65 per consultation.? [30 points]

a.What is the break-even quantity of consultations for Peter's "Personal Financial Services" operation? [10 points]

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b.If Peter's profit goal is $1000, how many consultations would he need to reach his goal? [10 points]

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c.Briefly explain the concept of a "Contribution Margin" and demonstrate how the Contribution Margin (CM) determined from the information above can be used to determine the same break-even quantity determined in part (a)? [10 points]

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3)Ace Machinery showed the following operating budget for the next year.

| Sales |  | $2,300,000 |
| --- | --- | --- |
| Fixed Cost | $1,200,000 |  |
| Total Variable Cost | 750,000 |  |
| Total cost |  | 1,950,000 |
| Net income |  | $300,000 |

Answer the following questions [50 points]:

a.Calculate the contribution margin and contribution rate. [10 points]

| Contribution Margin = Sales - Total Variable Cost  Contribution Rate = (Contribution Margin / Sales) \* 100 (to express it as a percentage)  Contribution Margin = $2,300,000 (Sales) - $750,000 (Total Variable Cost) = $1,550,000  Contribution Rate = ($1,550,000 / $2,300,000) \* 100 ≈ 67.39%  So, the contribution margin is $1,550,000, and the contribution rate is approximately 67.39%. |
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b.How much does Ace Machinery need to sell to break even? [10 points]

| Break-Even Sales = Fixed Costs / (1 - Variable Cost Ratio)  First, the Variable Cost Ratio, which is calculated as:  Variable Cost Ratio = Total Variable Cost / Sales  Variable Cost Ratio = $750,000 (Total Variable Cost) / $2,300,000 (Sales) ≈ 0.3261  Break-Even Sales:  Break-Even Sales = $1,200,000 (Fixed Costs) / (1 - 0.3261) ≈ $ 1,780,415.43  Ace Machinery needs to sell approximately $1,780,415.43 to break even. |
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c.If the company has to spend $250,000 on marketing, how much does Ace Machinery need to sell to break even? [10 points]

| Total Cost = Fixed Costs + Total Variable Cost + Marketing Expenses  Total cost:  Total Cost = $1,200,000 (Fixed Costs) + $750,000 (Total Variable Cost) + $250,000 (Marketing Expenses) = $2,200,000  The break-even sales with the new total cost:  Break-Even Sales = Total Cost / (1 - Variable Cost Ratio)  The Variable Cost Ratio is still the same:  Variable Cost Ratio ≈ 0.3261  Break-even sales:  Break-Even Sales = $2,200,000 (Total Cost) / (1 - 0.3261) ≈ $3,251,623.60  Ace Machinery needs to sell approximately $3,251,623.60 to break even when spending $250,000 on marketing. |
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d.If sales increase by 15%, what would the resulting net income be? (Fixed Cost is 1,200,000) [10 points]

| The new sales figure after a 15% increase:  New Sales = Sales + (Sales \* Increase Percentage)  New Sales = $2,300,000 + ($2,300,000 \* 0.15)  New Sales = $2,300,000 + $345,000  New Sales = $2,645,000  The New total cost using the original cost structure:  New Total Cost = Fixed Costs + Total Variable Cost  New Total Cost = $1,200,000 (Fixed Costs) + $750,000 (Total Variable Cost)  New Total Cost = $1,950,000  New net income:  New Net Income = New Sales - New Total Cost  New Net Income = $2,645,000 - $1,950,000  New Net Income = $695,000  The resulting net income, when sales increase by 15%, would be $695,000. |
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e.Complete the Python file accompanying this assignment to **calculate** and **display** this questions (a) to (d) parts. [10 points]

| print('Please Enter Sales Amount : ')  salesAmount = float(input())  print("Please Enter Fixed Cost : ")  fixedCost = float(input())  print("Please Total Variable Cost : ")  totalVariableCost = float(input())  contributionMargin = salesAmount - totalVariableCost  contributionRate = round((contributionMargin/salesAmount) \* 100,2)  print(f'So, the contribution margin is {contributionMargin}, and the contribution rate is approximately {contributionRate}%. ')  variableCostRatio = round(totalVariableCost / salesAmount,3)  breakEvenSales = round(fixedCost / (1-variableCostRatio),2)  print(f'Break-Even Sales: {breakEvenSales}') |
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**Deliverables**:

The word document file (**CPAN112\_CostVolumeProfitAnalysis\_BreakEven\_FirstName\_LastName**) contains your solution.