# **Assignment 1 – Due in Week 2.**

### **Answer the questions below in this file. Save it. Once you are done, upload to eCentennial under Assessments / Assignment / Assignment 1**

**For each of the problems below determine what is required i.e. identify the output(s) and then the given input(s). Do a sample calculation that will transform the input into the required output. If this is successful, then the problem is solvable. If it can be solved then create a three-column IPO chart similar to the ones we did in your first class and then generate an algorithm. Else if it is not solvable then explain what is needed to make it solvable. If you make any assumption in your calculation, then you must clearly state so.**

**For each question in your submission, you must have either**

1. **the question, output, input, processing (if any) any assumptions, a sample calculation, and the IPO chart/**

**or**

1. **the question and an explanation why it is not solvable**

**Please note that the IPO chart should not contains numbers, even the calculations just items**

1. Acme Builder’s Inc. has worked out that the wiring of an average house requires 45m of 14AWG wire. If a contractor has to wire 5 houses, what length of wire will be needed?  
     
   **Question:** Given that 45 meters of wire is needed for a house, how much wire is needed to wire 5 houses?  
   **Output(s):** Total length of wire for all houses  
   **Input(s):** Number of Houses, Length of wire needed per house  
   **Processing:** Nothing  
   **Sample Calculation:** Number of Houses (5) X Length of wire needed per house (45m) = Total Length of wire needed for all houses (225m)   
   **Assuming:** 14AWG wire is the only type of wire needed. The houses average out to require 45m of wire.

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| **IPO Chart** | | |
| **Input** | **Processing** | **Output** |
| Wire Length Per House |  | Total length of wire needed for all houses |
| Number of Houses | **Algorithm:** Enter the wire length per house and number of houses  Calculate the total length of wire needed for all houses by multiplying wire length per house by number of houses  Calculate the total length of wire needed for all houses by multiplying the wire length per house  Display total length of wire needed for all houses |  |

1. Burnaby Farms wants to estimate the cost of fertilizing their fields for the coming year. Each hectare of cultivated land requires 15kg and they intend to work 300 hectares.  
     
   **Question:** What is the estimated cost of fertilizing 300 hectares of land when one hectare of land requires 15kg of fertilizer?  
   **Cannot be answered due to insufficient information.** Specifically, the cost of fertilizer in weight.
2. Cherry Entertainment Corp. is looking into the profitability of hosting MMA XXII at the Rogers Center. The sale of tickets, broadcasting rights and advertising will gross approximately $2 million. How much profit will Cherry Entertainment Center make if Rogers Centre cost $800, 000?  
    **Question:** How much profit will Cherry Entertainment Center make in profit after $800,000 in expenses are taken from the $2,000,000 gross income.  
   **Output(s):** Profit   
   **Input(s):** Gross Income, Expenses  
   **Processing:** Nothing  
   **Sample Calculation:** Gross Income ($2,000,000) – Expenses ($800,000) = Profit ($1,200,000)  
   **Assuming:** Rogers Centre is the only expense. Tax does not need to be included in this.

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| **IPO Chart** | | |
| **Input** | **Processing** | **Output** |
| Gross Income |  | Profit |
| Expenses | **Algorithm:** Enter the gross income and expenses  Calculate the profit by subtracting expenses from gross income  Display profit |  |

1. Delta Airlines estimates that the fuel efficiency of a Boeing 747 jet is 12 liters per km. If the price of aviation fuel is $1 per liter, how much would it cost the airline to fly to New York and back from Toronto?  
     
   **Question:** What is the cost of fuel to fly a Boeing 747 to New York and back from Toronto given that fuel costs $1 per liter and uses 12 liters of fuel per km?  
   **Cannot be answered due to insufficient information.** Specifically, the distance between New York and Toronto in km.
2. Estelle’s Grocery is having a back to school sale of up to 50% off on most food items. The price of potatoes is 11₵ per kg. A plastic bag costs 5₵. What will the total cost (potatoes and bag) if someone buys 25kg of potatoes?  
     
   **Question:** What is the total cost of potatoes and the plastic bags needed?  
   **Cannot be answered due to insufficient information.** Specifically, how many kgs of potatoes a plastic bag can hold.
3. Fancy Jewelers is located in the Scarborough Town Center on the second floor near to Wal-Mart. In their Boxing week sale earrings were priced at $20 per pair. If Narendra wants to get a pair for as many females in his family as he can. How many pairs can he get if he has $125? [You may assume that there are more females in his family than he can buy earrings.]  
   **Question:** How many pairs of earrings can Narendra get with $125 when earrings cost $20 a piece.  
   **Output(s):** Number of pairs of earrings that can be bought  
   **Input(s):** Total amount of money, cost of a pair of earrings  
   **Processing:** unrounded number of earrings that can be bought  
   **Sample Calculation:** Total amount of money ($125) / cost of earrings ($20) = unrounded number of earrings (6.25) ~= 6  
   **Assuming:** There are more females in Narendra’s family than he can buy earrings.

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| **IPO Chart** | | |
| **Input** | **Processing** | **Output** |
| Total amount of money | **Processing Items:** unrounded number of earrings that can be bought | Number of earrings that can be bought |
| Cost of earrings | **Algorithm:** Enter the total amount of money and cost of earrings  Calculate the unrounded number of earrings that can be bought by dividing the total amount of money by the cost of earrings  Calculate the number of earrings that can be bought by rounding down the unrounded number of earrings that can be bought Display the number of earrings that can be bought |  |

1. Gerard The Plumber charges $1.25 per meter for pipe installation. Each join cost 90₵. How much will Gerard charge for a job that is 12m with 4 joints?  
    **Question:** How much does it cost for Gerard to install pipe and joints, given pipe costs $1.25 per meter of pipe installed and 90 cents per joint installed?  
   **Output(s):** Total cost for plumbing job  
   **Input(s):** Number of meters of pipe, cost per meter of pipe installed, Number of joints, cost per joint installed  
   **Processing:** Total cost of pipe, Total cost of joints  
   **Sample Calculation:**   
   Numbers of meters of pipe (12) x cost per meter of pipe installed ($1.25) = total cost of pipe ($15)  
   Number of joints (4) x cost per joint ($0.9) installed = total cost of joints ($3.6)  
   Total cost of pipe ($15) + total cost of joints ($3.6) = total cost for plumbing job ($18.6)  
   **Assuming:** There is no other cost to this job.

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| **IPO Chart** | | |
| **Input** | **Processing** | **Output** |
| Number of meters of pipe | **Processing Items:** Total cost of pipe, Total cost of joints | Total cost for plumbing job |
| Cost per meter of pipe installed | **Algorithm:** Enter the number of meters of pipe, cost per meter of pipe installed, number of joints, cost per joint installed  Calculate the Total cost of pipe by multiplying number of meters of pipe with the cost per meter of pipe installed  Calculate the total cost of joints by multiplying number of joints with cost per joint installed  Add the total cost of pipe and total cost of joints to get the total cost for plumbing job  Display the total cost for plumbing job |  |
| Number of joints |
| Cost per joint installed |

1. Last year at the CNE, the Halls family bought 50 ride tickets. If the Polar Express, the Ferris Wheel, the HighDrop and the WaterFall requires 15, 10, 12 and 9 tickets respectively, how many tickets will remain at the end of the day?  
   **Question:** How many tickets will remain after the family rides a number of rides at the CNE?  
   **Cannot be answered due to insufficient information.** Specifically, which rides were ridden by the family and how many times was each ride ridden.
2. Isabelle’s Confectionary sells a packet of Maynard’s sourdrops for 25₵. Each packet contains approximately 30 candies. How many packets will Sarah get if she has $3?  
   **Question:** How many packets of sourdrops can Sarah buy with $3 given that one packet costs 25 cents?  
   **Output(s):** Total number of packets bought  
   **Input(s):** Total amount of money, cost per packet,   
   **Processing:** Nothing  
   **Sample Calculation:**   
   Total amount of money ($3) / Cost per packet ($0.25) = Total number of packets bought (12)  
   **Assuming:** Maynard’s sourdrops stay 25 cents, so the output will never need to rounded.

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| **IPO Chart** | | |
| **Input** | **Processing** | **Output** |
| Cost per packet |  | Total number of packets bought |
| Total amount of money | Algorithm: Enter the number of packets, cost per packet, total amount of money  Calculate the total cost of packets by multiplying number of packets by the cost per packet  Calculate the total number of packets bought by |  |

1. Jake’s Towing Services works out of the Markham/Finch area. They charge $5.50 per km for towing in addition to a flat service fee of $18. What would be the cost of towing a Toyota RAV 4 from Morningside/Ellesmere to McCowan/Sheppard?  
   **Question:** What is the cost of towing a car from Morningside/Ellesmere to McCowan/Sheppard given that it is $5.50 per km towed and $18 of a flat rate?  
   **Cannot be answered due to insufficient information.** Specifically, how far the distance between Morningside/Ellesmere and McCowan/Sheppard is.