Problem Set – Loops & Functions

1. Enter destination city, miles travelled to get there and gallons of gasoline used for any number of trips entered at the keyboard (use ctl+z to stop). Use a function to compute miles per gallon. Display the destination city and miles per gallon for each trip entered. Sum the miles travelled and give a count of the number of trips made. Display these at the end of the program.

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| Input | Process | Output |
| Function: mpg, miles, gallon | Function to calculate MPG: mpg = miles / gallon |  |
| Main: miles, gallon, mpg | Enter values for city, miles and gallons |  |
| City | Start loop: MPG = FUNCTION  total miles = total miles + miles total trips = total trips + 1  Display city and mpg  End loop: | City: CITY  Mpg: MPG |
| Total miles, total trips | Display total miles and total trips | Total miles : TOTAL MILES  Total trips : TOTAL TRIPS |
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1. Allow the employee to enter last name, job code and hours worked (use ctl+z to stop). Use a function to calculate pay. (Job code L is $25/hr, A is $30/hr and J is $50/hr). Give time and a half for overtime. Display last name and pay for each employee. Sum the pay for each employee as well as count the entries made. After all entries are made, compute and display the average pay and the number of entries made.

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| Input | Process | Output |
| Function:  Code, hourly pay | Function to decide hourly pay:  If code L, hourly pay = 25  If code A, hourly = 30  If code J, hourly = 50 |  |
| Name, code, hours, hourly pay, pay | Enter values for name, code and hours |  |
| Ot hours, hourly ot pay, ot pay, base pay | Start loop:  Hourly pay = FUNCTION  Start if statement: if hours > 40:  Ot hours = hours – 40  Hourly ot pay = hourly pay \* 1.5  Ot pay = ot hours \* hourly ot pay  Base pay = hourly \* 40  Pay = base pay + ot pay  Else: pay = hourly pay \* hours  Pay sum = pay sum + pay  Entries = entries + 1  Display name and pay  End loop: | Name: NAME  Pay: PAY |
| Entries, pay sum |  |  |
| Average pay | Average = pay sum / entries  Display average pay and entries | Average: AVERAGE  Entries: ENTRIES |

1. Allow any number of students to enter their last name and the credits taken (use ctl+z to stop). Charge $250 per credit hour. Use a function to compute total tuition. Display student last name, credits taken and tuition owed. Sum tuition and give a count of the number of students who entered data.

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| Input | Process | Ouput |
| Function: credit, tuition | Function to calculate tuition cost: tuition = credit \* 250 |  |
| Main:  name, credits, tuition | Enter values for name and credits |  |
| Total tuition, entries | Start loop:  Tuition = FUNCTION  Total tuition = total tuition + tuition  Entries = entries + 1  Display name, credits, tuition  End loop: | Name: NAME  Credits: CREDITS  Tuition: TUITION |
|  | Display total tuition and entries | Total tuition: TOTAL TUITION  Entries: ENTRIES |
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1. Any number of customers will enter a product code (W, C, G) and a quantity (ctl+z to stop). Use a function to determine unit price. Write another function to compute shipping. Then compute the total. Display the product code, unit price, shipping, extended price (quantity x unit price) and total for the order for each entry. Sum and display the total of all entries made.

Product Code Unit Price Shipping

W $10.00 $2.00

C $15.00 $5.00

G $20.00 $7.00

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| Input | Process | Output |
| Function 1:  Code, unit price | Function to decide unit price based on code: if code W, price = 10  If code C, price 15  If code G, price 20 |  |
| Function 2:  Code, shipping | Function to decide shipping price:  If code W, price = 2  If code C, price = 5  If code G, price 7 |  |
| Main:  Code, quantity, unit price | Enter values for code and quantity |  |
| Extended price, shipping, total | Start loop:  Unit price = Function 1  Shipping price = Function2  Extended price = unit price \* quantity  Total = extended price + shipping  Total sum = total sum + total  Entries = entries + 1  Display code, unit price, shipping, extended price and total | Code: CODE  Unit price: UNIT PRICE  Shipping: SHIPPING  Extended price: EXTENDED PRICE  Total: TOTAL  "Enter product code (W, C, G) and quantity (CTRL + Z if done): " |
| Total sum, entries | Display entries entered and total sum | Entries: ENTRIES  Entry total: ENTRY TOTAL |

1. Allow students to enter the department and course code as noted below for any number of courses (ctl+z to stop). Use a function to determine the lab fee also in the table below. For each entry display the department, course code and lab fee. Give the total of all lab fees to collect. Compute and display the average lab fee.

Department Course Code Lab Fee

CIS 101 $50.00

CIS 121 $100.00

MAT 111 $25.00

MAT 112 $35.00

ENG 100 $55.00

All Others $50.00

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| Input | Process | Output |
| Function 1:  Department, code, lab fee | Create function to determine the cost of lab fee based on department and code:  If department CIS and code 101, lab fee = 50 if department CIS and code 121, lab fee = 100  If department MAT and code 111, lab fee = 25  If department MAT and code 112, lab fee = 35  If department ENG and code 100, lab fee 55  Anything else, lab fee 50 |  |
| Function 2:  Total, entries, average | Function to calculate average lab fee:  Average = total / entries |  |
| Main:  Department, code, lab fee, total, entries | Enter values for department and code |  |
|  | Start loop:  Lab fee = FUNCTION 1  Entries = entries + 1  Total fee = total fee + lab fee  Display department, code, and lab fee end loop: | Department: DEPARTMENT  Code: CODE  Lab fee: LAB FEE |
|  | Display total and average | Total: TOTAL  Average: AVERAGE |