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 |
| city | function:compute\_mpg  input:miles, gasgallons  mpg=miles/gasgallon  return mpg | inside loop  city  mpg |
| miles | summiles=0  tripcount=0 | outside loop  summiles  tripcount |
| gasgallons | while not eof |  |
|  | mpg=compute\_mpg(miles, gasgallons) |  |
|  | summiles=summiles+miles;  tripcount=tripcount+1 |  |
|  | display:city and mpg  ask prompt again |  |
|  | end of loop |  |

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 |
| lname | function:compute\_pay  input:payrate, hours  if(hours>40)  overtimehours=hours-40  pay=(payrate\*40)+(payrate\*1.5\*overtimehours)  else  pay=payrate\*hours  return pay | inside loop  lname  pay |
| jobcode | sumpay=0  entrycount=0 | outside loop  averagepay  entrycount |
| hours | while not eof |  |
|  | switch (jobcode)  case ‘L’:  payrate=25  case ’A’:  payrate=30  case ‘J’:  payrate=50  default  incorrect jobcode |  |
|  | pay=compute\_pay(payrate, hours) |  |
|  | sumpay=sumpay+pay  entrycount=entrycount+1 |  |
|  | display:lname and pay  ask prompt again |  |
|  | end of loop |  |
|  | averagepay=sumpay/entrycount |  |

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 | Output |
| lname | function:compute\_tuition  input:credits  tuition=credits\*250  return tuition | inside loop  lname  credits  tuition |
| credits | sumtuition=0  numcount=0 | outside loop  sumtuition  numcount |
|  | while not eof |  |
|  | tuition=compute\_tuition(credits) |  |
|  | sumtuition=sumtuition+tuition  numcount=numcount+1 |  |
|  | display:lname, credits, tuition |  |
|  | end of loop |  |

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 |
| productcode | function:compute\_unitprice  input:productcode  switch(productcode)  case ‘W’:  unitprice=10  case ‘C’:  unitprice=15  case ‘G’  unitprice=20  default  incorrect product code  return unitprice | inside loop  productcode  unitprice  shipping  extprice  total |
| qty | function:compute\_shipping  input productcode  switch(productcode)  case ‘W’:  shipping=2  case ‘C’:  shipping=5  default  shipping=7  return shipping | outside loop  sumtotal  numcount |
|  | sumtotal=0  numcount=0 |  |
|  | while not eof |  |
|  | unitprice=compute\_unitprice(productcode)  shipping=compute\_shipping(productcode) |  |
|  | extprice=qty\*unitprice |  |
|  | total=extprice+shipping |  |
|  | sumtotal=sumtotal+total  numcount=numcount+1 |  |
|  | display:productcode, unitprice, shipping, extprice, and total  ask prompt again |  |
|  | end of loop |  |

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 |
| department | function:compute\_fee  input:code  switch(code)  case 101:  fee=50  case121:  fee=100  case 111:  fee=25  case 112:  fee=35  case 100:  fee=55  default  fee=50  return fee | inside loop  department  code  fee |
| code | sumfee=0  numcount=0 | outside loop  sumfee  averagefee |
|  | while not eof |  |
|  | fee=compute\_fee(code) |  |
|  | sumfee=sumfee+fee  numcount=numcount+1 |  |
|  | display:department, code, fee  ask prompt again |  |
|  | end of loop |  |
|  | averagefee=sumfee/numcount |  |