**UNIVERSITI MALAYSIA SARAWAK**

**Faculty of Computer Science and Information Technology**

**Assignment**

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| Assignment  Number of Title | Pair Assignment | |
| Subject Code | TMF 1414 | Subject Name: Introduction to Programming |

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| Due Date : 3rd November 2019 | Date received and approved (for office use only) |

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| **MARK :** | Comments: |

This cover sheet must be completed, signed and firmly attached to the front of the submission.

All work must be submitted by the due date. If an extension of work is granted, an assignment extension acknowledge slip must be signed by lecturer/ tutor and attached to the assignment.

Please note that it is the student’s responsibility to retain a copy of his/her own assignment.

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**Introduction**

We (Chris & Joash) are working at a telephone company that sells pre-paid reload card. We were instructed by our manager to write a program to estimate the total call charge for every customer. Every phone call is charged as table shown below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Call Type** | **Fixed Charge** | **First 3 minutes** | **Subsequent Minutes** |
| Local  (Same operator) | Flat rate @ RM0.20 / 25 sec block | - | - |
| Local  (Other Operator) | Flat rate @ RM0.35 / 30 sec block | - | - |
| International (Landline) | RM0.50 | RM2.50 | RM0.75 / min block |
| International (Mobile) | RM1.00 | RM3.00 | RM0.85 / min block |

Local call is charged at flat rate in block. A block is a duration between 0 – 25 sec for same operator and 0 – 30 sec for other operator. This means that a call of 1 sec is also considered as one block. The subsequent minutes for international call is in per minute block where a duration less than 1 minute is considered as a block.

**Requirements:**

* The program should initially prompt the user for the number of call made.
* Then input the type and duration for each phone call.
* Your program should output the total charge for each call, total of duration for local call with total charge as well as duration for international call with total charge. Finally, the total charge for the customer is displayed on the screen.
* Your program should check for invalid data such as non-positive or number of calls or less than 1, number of second greater than 60 and so on wherever you think necessary. It should prompt the user for corrected input whenever it detects invalid input.
* Applying appropriate control structures to handle program logic in your program.
  + Include at least one (1) different type of selection or multiple selection structure
  + Include at least two (2) different type of repetition structures

**Flow charts**

numcalls, calltype, i, minute, second, localtotalduration, intertotalduration, minutelocal, secondlocal, minuteinter, secondinter, totalcharge1, totalcharge2, totalcharge3, totalcharge4, totalcharge, totallocalcharge, totalintercharge, flatratesameopt, flatratedifferopt, flatrateinter, flatrateintermobile, duration1, duration2, duration3, duration4, block, block1, block2, block3, block4, fixedcharge, firstthreeminutes, fixedcharge3, firstthreeminutes3

Display “Enter the number of call(s) : ”

numcalls

i=1; i<=numcalls

Yes

DISPLAY Enter the type of call %d (1-Local(Same); 2-Local(Other); 3-Inter(Land); 4-Inter(Mobile)): , i

INPUT calltype

DISPLAY Enter the duration of call-%d (in minute and second, separated by a space): , i

INPUT minute, second

No

i++

A

A

A

**COMPUTE** duration1=minute\*60+second;

**COMPUTE** block1=ceil(duration/25);

**COMPUTE** totalcharge1=block1\*0.20;

break

No

False

F

False

F

False

F

B

**COMPUTE** totalcharge3 = (block3 \* flatrateinter) + fixedcharge3+firstthreeminutes3

Display Call %d charge is RM%.2f\n\n, i, totalcharge3

Yes

**COMPUTE** totalcharge3=fixedcharge3+firstthreeminutes3

(duration3<=180&&duration3>0)

**COMPUTE** duration3=minute\*60+second

**COMPUTE** block3=ceil((duration3-180)/60)

True

**SET** flatrateinter = 0.75;

**SET** fixedcharge3= 0.50;

**SET** firstthreeminutes3= 2.50;

case 3

break

**DISPLAY** Call-%d charge is RM%.2f\n\n, i, totalcharge2

**COMPUTE** duration2=minute\*60+second;

**COMPUTE** block2=ceil(duration2/30);

**COMPUTE** totalcharge2=block2\*0.35;

True

v

case 2

break

**DISPLAY** Call-%d charge is RM%.2f\n\n", i, totalcharge1

True

case 1

C

True

B

C

**Default DISPLAY** Invalid choice

break

Yes

(duration4<=180&&duration3>0)

**COMPUTE** totalcharge4=fixedcharge4+firstthreeminutes4

**COMPUTE** totalcharge4 = (block4 \* flatrateinter) + fixedcharge4+firstthreeminutes4

Display Call %d charge is RM%.2f\n\n, i, totalcharge4

**COMPUTE** duration4=minute\*60+second

**COMPUTE** block4=ceil((duration4-180)/60)

**SET** flatrateintermobile = 0.85

**SET** fixedcharge= 1.00

**SET** firstthreeminutes= 3.00

case 4

**DISPLAY** Total local call duration is %dmin %dsec \n, minutelocal, secondlocal

**DISPLAY** Total local charge is RM%.2f \n, totallocalcharge

**DISPLAY** Total international call duration is %dmin %dsec \n, minuteinter, secondinter

**DISPLAY** Total international charge is RM%.2f \n, totalintercharge

**DISPLAY** Total charge is RM%.2f \n, totalcharge

**COMPUTE** localtotalduration= duration1+duration2

**COMPUTE** intertotalduration= duration3+duration4

**COMPUTE** minutelocal = localtotalduration / 60

**COMPUTE** secondlocal = localtotalduration % 60

**COMPUTE** minuteinter = intertotalduration / 60

**COMPUTE** secondinter = intertotalduration % 60

**COMPUTE** totallocalcharge = totalcharge1 + totalcharge2

**COMPUTE** totalintercharge = totalcharge3 + totalcharge4

**COMPUTE** totalcharge = totalcharge1 + totalcharge2 + totalcharge3 + totalcharge4

False

F

No

No

**Pseudocode**

**START**

**GET** numcalls, calltype, i, minute, second, localtotalduration, intertotalduration, minutelocal, secondlocal, minuteinter, secondinter, totalcharge1, totalcharge2, totalcharge3, totalcharge4, totalcharge, totallocalcharge, totalintercharge, flatratesameopt, flatratedifferopt, flatrateinter, flatrateintermobile, duration1, duration2, duration3, duration4, block, block1, block2, block3, block4, fixedcharge, firstthreeminutes, fixedcharge3, firstthreeminutes3;

**DISPLAY** “Enter the number of call(s) : ”

**INPUT** numcalls;

**FOR** (i=1; i<=numcalls; i++)

**DISPLAY** "Enter the type of call %d (1-Local(Same); 2-Local(Other);   
 3-Inter(Land); 4-Inter(Mobile)): ", i;

**INPUT** calltype;

**DISPLAY** "Enter the duration of call-%d (in minute and second, separated by a space): ", i;

**INPUT** minute, second;

**ENDFOR**

**CASE** calltype of

1: **COMPUTE** duration1=minute\*60+second;

**COMPUTE** block1=ceil(duration/25);

**COMPUTE** totalcharge1=block1\*0.20;

**DISPLAY** “"Call-%d charge is RM%.2f\n\n", i, totalcharge1;

2: **COMPUTE** duration2=minute\*60+second;

**COMPUTE** block2=ceil(duration2/30);

**COMPUTE** totalcharge2=block2\*0.35;

**DISPLAY** "Call-%d charge is RM%.2f\n\n", i, totalcharge2;

3: **SET** flatrateinter = 0.75;

**SET**  fixedcharge3= 0.50;

**SET** firstthreeminutes3= 2.50;

**COMPUTE** duration3=minute\*60+second;

**COMPUTE** block3=ceil((duration3-180)/60);

**IF** (duration3<=180&&duration3>0)

**COMPUTE** totalcharge3=fixedcharge3+firstthreeminutes3;

**DISPLAY** "Call-%d charge is RM%.2lf\n\n",i,totalcharge3);

**ELSE**

**COMPUTE** totalcharge3 = (block3 \* flatrateinter) + fixedcharge3+ firstthreeminutes3;

**DISPLAY** "Call %d charge is RM%.2f\n\n", i, totalcharge3;

**ENDIF**

4: **SET** flatrateintermobile = 0.85;

**SET** fixedcharge= 1.00;

**SET** firstthreeminutes= 3.00;

**COMPUTE** duration4=minute\*60+second;

**COMPUTE** block4=ceil((duration4-180)/60);

**IF** (duration4<=180&&duration4>0)

**COMPUTE** totalcharge4=fixedcharge+firstthreeminutes;

**DISPLAY** "Call-%d charge is RM%.2f\n\n",i,totalcharge4;

**ELSE**

**COMPUTE** totalcharge4 = (block4 \* flatrateintermobile) + fixedcharge + firstthreeminutes;

**DISPLAY** "Call %d charge is RM%.2f\n\n", i, totalcharge4;

**ENDIF**

**OTHERS**

**DISPLAY** "Invalid choice.\n";

**ENDCASE**

**COMPUTE** localtotalduration= duration1+duration2;

**COMPUTE** intertotalduration= duration3+duration4;

**COMPUTE** minutelocal = localtotalduration / 60;

**COMPUTE** secondlocal = localtotalduration % 60;

**COMPUTE** minuteinter = intertotalduration / 60;

**COMPUTE** secondinter = intertotalduration % 60;

**COMPUTE** totallocalcharge = totalcharge1 + totalcharge2;

**COMPUTE** totalintercharge = totalcharge3 + totalcharge4;

**COMPUTE** totalcharge = totalcharge1 + totalcharge2 + totalcharge3 + totalcharge4;

**DISPLAY** "Total local call duration is %dmin %dsec \n", minutelocal, secondlocal;

**DISPLAY** "Total local charge is RM%.2f \n", totallocalcharge;

**DISPLAY** "Total international call duration is %dmin %dsec \n", minuteinter, secondinter;

**DISPLAY** "Total international charge is RM%.2f \n", totalintercharge;

**DISPLAY** "Total charge is RM%.2f \n", totalcharge;

**END**

**Print screens**





