

CISC1600: Computer Science I Train Ticket

Objective: To *show* our understanding of functions and specifically how arguments are passed to functions (i.e. *pass by value*, *pass by reference*.) To *further* our understanding of *loops*, their logic and the correct use of the ***while()***, ***do .. while()*** and ***for*** control structures in the C++ programming language. Specifically to show an understanding of the logically appropriate use of *nested* loops and embedded *conditional* statements. To *reinforce* our understanding of *data types* and *variables*. Namely, how to create, initialize, display and perform basic arithmetic operations on those variables.

Assignment:, Ticket fares on Metro North Trains for a trip from Grand Central Station to Fordham follow this schedule:

TYPE OF TICKET	ON BOARD	STATION	WEBTICKET
ONE-WAY			
PEAK			
One Way Peak	\$15.00	\$8.75	\$8.75
One Way Senior/Disabled/Medicare This ticket is not valid on inbound AM peak trains.	\$4.25	\$4.25	\$4.25
One Way Child Peak	\$10.00	\$4.25	\$4.25
OFF-PEAK			
One Way Off-Peak	\$13.00	\$6.50	\$6.50
One Way Senior/Disabled/Medicare	\$4.25	\$4.25	\$4.25
One Way Child Off-Peak	\$9.00	\$3.25	\$3.25
ROUND TRIP			
PEAK			
Round Trip Peak	N/A	\$17.50	\$17.50
Round Trip Child Peak	N/A	\$8.50	\$8.50
OFF-PEAK			
Round Trip Off-Peak	N/A	\$13.00	\$13.00
Round Trip Senior/Disabled/Medicare	N/A	\$8.50	\$8.50
Round Trip Child Off-Peak	N/A	\$6.50	\$6.50

Write a program to simulate a train ticket machine with touch screen.

The user selects **R** for Regular, **S** for Senior or **C** for child. Choice is stored in **char Age**.

The user selects **O** for one way or **R** for round trip. Choice is stored in **char round**.

The user selects **P** for peak or **O** for off-peak. Choice is stored in **char peak**.

The machine displays the cost of the ticket according to the STATION column. The amount is stored in **double cost**.

The user inserts money and enters the amount inserted in **double money**.

The machine dispenses the ticket and the amount of change.

The user at any time can select the **X** button to cancel.

The machine can display a message

"Would you like to purchase another ticket? Press **Y** for yes **N** for no: "

Write functions:

getAge (R, S, C or X)

getRound (O or R or X)

getPeak (P or O or X)

getCost that takes no arguments and returns the cost of the ticket as a double.

getDouble, that takes no arguments and returns a double. It asks the user to enter the amount of money as double (eg: 5.20). The function keeps asking if the user enters a negative value. A zero indicates cancel.

Use constants like REGULAR ..., ONEWAY..., PEAK ... , CANCEL .. etc., when validating user input and when calculating cost.

calculateChange, that takes two double arguments **price** (4.15 or 5.25) and **money** (the amount of money entered by the user). The function returns the amount of change. The main() function calls **calculateChange** only if the user entered money is greater or equal to the price of the selected ticket.

You may write additional functions.

Examples are shown below: Please read them first.

Select R for Regular, S for Senior or C for child: **R**

Select O for one way or R for round trip: **O**

Select P for peak or O for off-peak. **O**

The cost for a Regular one-way off-peak ticket is \$6.50

Select the amount you paid: **\$7.00**

Please collect your ticket. Your change is \$0.50

Would you like to purchase another ticket? Press Y for yes N for no: **Y**

Select R for Regular, S for Senior or C for child: **R**

Select O for one way or R for round trip: **O**

Select P for peak or O for off-peak. **O**

The cost for a Regular one-way off-peak ticket is \$6.50

Select the amount you paid: **\$6.00**

The cost for a Regular one-way off-peak ticket is \$6.50

Your change is \$6.00

Would you like to purchase another ticket? Press Y for yes N for no: **Y**

Select R for Regular, S for Senior or C for child: **R**

Select O for one way or R for round trip: **R**

Select P for peak or O for off-peak. **O**

The cost for a Regular one-way off-peak ticket is \$13.00

Select the amount you paid: **\$15.25**

Please collect your ticket. Your change is \$2.25

Would you like to purchase another ticket? Press Y for yes N for no: **Y**

Select R for Regular, S for Senior or C for child: **R**

Select O for one way or R for round trip: **R**

Select P for peak or O for off-peak. **O**

The cost for a Regular one-way off-peak ticket is \$13.00

Select the amount you paid: **\$0**

Transaction cancelled.

Would you like to purchase another ticket? Press Y for yes N for no: **N**