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CEG 3110 Project 2

**Some Notes and Assumptions for Test Plan**

I’m going to assume that valid entries of 1-12 are input for the month, 1-31 for the date, and a 4-digit number is input for the year. My test plan is meant to thoroughly test the age calculation first, and then test the age versus rating code under the assumption that the age itself is now accurate.

Test cases 1-18 are meant to test the age calculation. Test cases 1-3 test what happens when the current date is within one day of the birthdate. Test cases 4 and 5 test for when the current month is one month ahead or behind the birth month. Test cases 6 and 7 ensure that birth years in either the 1900s or 2000s can result in the correct age. Test case 8 tests for the acceptability of a 3-digit age. Test cases 9-13 are meant to exercise leap day birthdays. Finally, test cases 14-18 deal with the difference between 30- and 31-day months.

Test cases 19-32 are meant to test the age versus rating code of a video game. Test cases 19 and 20 test to see if EC and E rated games will rent even to a one year old. Each of the remaining 4 ratings get 3 test cases each: with a person one year too young, a person exactly the right age, and a person who is old enough with a year to spare.

**Test Plan**

**Test Case 1:**

Input:

Today’s Date: 09/24/2018

Birthdate: 09/25/2002

Expected Result:

The customer’s age is 15.

Actual Result:

The customer’s age is 15.

Pass: Fail:

**Test Case 2:**

Input:

Today’s Date: 09/24/2018

Birthdate: 09/24/2002

Expected Result:

The customer’s age is 16.

Actual Result:

The customer’s age is 16.

Pass: Fail:

**Test Case 3:**

Input:

Today’s Date: 09/24/2018

Birthdate: 09/23/2002

Expected Result:

The customer’s age is 16.

Actual Result:

The customer’s age is 16.

Pass: Fail:

**Test Case 4:**

Input:

Today’s Date: 09/24/2018

Birthdate: 10/20/2002

Expected Result:

The customer’s age is 15.

Actual Result:

The customer’s age is 15.

Pass: Fail:

**Test Case 5:**

Input:

Today’s Date: 09/24/2018

Birthdate: 08/20/2002

Expected Result:

The customer’s age is 16.

Actual Result:

The customer’s age is 16.

Pass: Fail:

**Test Case 6:**

Input:

Today’s Date: 09/24/2018

Birthdate: 08/23/1999

Expected Result:

The customer’s age is 19.

Actual Result:

The customer’s age is 19.

Pass: Fail:

**Test Case 7:**

Input:

Today’s Date: 09/24/2018

Birthdate: 08/23/2000

Expected Result:

The customer’s age is 18.

Actual Result:

The customer’s age is 18.

Pass: Fail:

**Test Case 8:**

Input:

Today’s Date: 09/24/2018

Birthdate: 08/23/1918

Expected Result:

The customer’s age is 100.

Actual Result:

The customer’s age is 100.

Pass: Fail:

**Test Case 9:**

Input:

Today’s Date: 03/01/2018

Birthdate: 02/29/1900

Expected Result:

Invalid birthdate given.

Actual Result:

Invalid birthdate given.

Pass: Fail:

**Test Case 10:**

Input:

Today’s Date: 03/01/2018

Birthdate: 02/29/2000

Expected Result:

The customer’s age is 18.

Actual Result:

The customer’s age is 18.

Pass: Fail:

**Test Case 11:**

Input:

Today’s Date: 03/01/2018

Birthdate: 02/29/2004

Expected Result:

The customer’s age is 14.

Actual Result:

The customer’s age is 14.

Pass: Fail:

**Test Case 12:**

Input:

Today’s Date: 02/28/2018

Birthdate: 02/29/2004

Expected Result:

The customer’s age is 13.

Actual Result:

The customer’s age is 13.

Pass: Fail:

**Test Case 13:**

Input:

Today’s Date: 02/29/2016

Birthdate: 02/29/2004

Expected Result:

The customer’s age is 12.

Actual Result:

The customer’s age is 12.

Pass: Fail:

**Test Case 14:**

Input:

Today’s Date: 08/31/2018

Birthdate: 08/31/2002

Expected Result:

The customer’s age is 16.

Actual Result:

The customer’s age is 16.

Pass: Fail:

**Test Case 15:**

Input:

Today’s Date: 08/31/2018

Birthdate: 09/01/2002

Expected Result:

The customer’s age is 15.

Actual Result:

The customer’s age is 15.

Pass: Fail:

**Test Case 16:**

Input:

Today’s Date: 09/30/2018

Birthdate: 09/30/2002

Expected Result:

The customer’s age is 16.

Actual Result:

The customer’s age is 16.

Pass: Fail:

**Test Case 17:**

Input:

Today’s Date: 09/30/2018

Birthdate: 09/31/2002

Expected Result:

Invalid birthdate given.

Actual Result:

Invalid birthdate given.

Pass: Fail:

**Test Case 18:**

Input:

Today’s Date: 09/30/2018

Birthdate: 10/01/2002

Expected Result:

The customer’s age is 15.

Actual Result:

The customer’s age is 15.

Pass: Fail:

**Test Case 19:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2017)

Scan Game with Rating: EC

Expected Result:

(The customer’s age is 1) Rental Accepted

Actual Result:

(The customer’s age is 1) Rental Accepted

Pass: Fail:

**Test Case 20:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2017)

Scan Game with Rating: E

Expected Result:

(The customer’s age is 1) Rental Accepted

Actual Result:

(The customer’s age is 1) Rental Accepted

Pass: Fail:

**Test Case 21:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2009)

Scan Game with Rating: E10

Expected Result:

(The customer’s age is 9) Rental Rejected

Actual Result:

(The customer’s age is 9) Rental Rejected

Pass: Fail:

**Test Case 22:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2008)

Scan Game with Rating: E10

Expected Result:

(The customer’s age is 10) Rental Accepted

Actual Result:

(The customer’s age is 10) Rental Accepted

Pass: Fail:

**Test Case 23:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2007)

Scan Game with Rating: E10

Expected Result:

(The customer’s age is 11) Rental Accepted

Actual Result:

(The customer’s age is 11) Rental Accepted

Pass: Fail:

**Test Case 24:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2006)

Scan Game with Rating: T

Expected Result:

(The customer’s age is 12) Rental Rejected

Actual Result:

(The customer’s age is 12) Rental Rejected

Pass: Fail:

**Test Case 25:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2005)

Scan Game with Rating: T

Expected Result:

(The customer’s age is 13) Rental Accepted

Actual Result:

(The customer’s age is 13) Rental Accepted

Pass: Fail:

**Test Case 26:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2004)

Scan Game with Rating: T

Expected Result:

(The customer’s age is 14) Rental Accepted

Actual Result:

(The customer’s age is 14) Rental Accepted

Pass: Fail:

**Test Case 27:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2002)

Scan Game with Rating: M

Expected Result:

(The customer’s age is 16) Rental Rejected

Actual Result:

(The customer’s age is 16) Rental Rejected

Pass: Fail:

**Test Case 28:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2001)

Scan Game with Rating: M

Expected Result:

(The customer’s age is 17) Rental Accepted

Actual Result:

(The customer’s age is 17) Rental Accepted

Pass: Fail:

**Test Case 29:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2000)

Scan Game with Rating: M

Expected Result:

(The customer’s age is 18) Rental Accepted

Actual Result:

(The customer’s age is 18) Rental Accepted

Pass: Fail:

**Test Case 30:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2001)

Scan Game with Rating: AO

Expected Result:

(The customer’s age is 17) Rental Rejected

Actual Result:

(The customer’s age is 17) Rental Rejected

Pass: Fail:

**Test Case 31:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/2000)

Scan Game with Rating: AO

Expected Result:

(The customer’s age is 18) Rental Accepted

Actual Result:

(The customer’s age is 18) Rental Accepted

Pass: Fail:

**Test Case 32:**

Input:

(Today’s Date: 09/24/2018 Birthdate: 08/23/1999)

Scan Game with Rating: AO

Expected Result:

(The customer’s age is 19) Rental Accepted

Actual Result:

(The customer’s age is 19) Rental Accepted

Pass: Fail:

**Sample Outputs**

run:

Please enter today's date, followed by the customer's birthdate.

09/24/2018 08/23/2017

Please enter rental codes now: EC E E10

The customer's age is 1.

Scan Game with Rating: EC

Rental Accepted

Scan Game with Rating: E

Rental Accepted

Scan Game with Rating: E10

Rental Rejected

BUILD SUCCESSFUL (total time: 39 seconds)

run:

Please enter today's date, followed by the customer's birthdate.

09/24/2018 08/23/2005

Please enter rental codes now: E10 T M

The customer's age is 13.

Scan Game with Rating: E10

Rental Accepted

Scan Game with Rating: T

Rental Accepted

Scan Game with Rating: M

Rental Rejected

BUILD SUCCESSFUL (total time: 1 minute 17 seconds)

run:

Please enter today's date, followed by the customer's birthdate.

09/24/2018 08/23/2001

Please enter rental codes now: T M AO

The customer's age is 17.

Scan Game with Rating: T

Rental Accepted

Scan Game with Rating: M

Rental Accepted

Scan Game with Rating: AO

Rental Rejected

BUILD SUCCESSFUL (total time: 20 seconds)

**Source Code (client class)**

/\*

\* Daniel Nedrow

\* CEG 3110

\* Project 2

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\*/

package ceg3110project2;

/\*\*

\* @author Daniel This class provides age calculations and compares those ages

\* against the minimum ages to rent video games with a variety of ratings.

\*/

public class RentalTransaction {

String currentDate, birthDate;

int currentMonth, currentDay, currentYear, birthMonth, birthDay, birthYear, age;

/\*\*

\* Create a new rental transaction with given current date and customer

\* bday.

\* @param currentDate the "current date" as entered by cashier

\* @param birthDate the customer's birth date

\*/

public RentalTransaction(String currentDate, String birthDate) {

this.currentDate = currentDate;

this.birthDate = birthDate;

dateStringsToInts(); // get each date from a string to 3 ints

calculateAge(); // note that call to calculate age is in constructor

System.out.println("The customer's age is " + age + "."); // for testing

}

/\*\*

\* Takes the current and birth dates (which are Strings) and breaks them

\* down into individual ints for month, day, and year.

\*/

private void dateStringsToInts() {

String[] current = currentDate.split("/");

String[] birth = birthDate.split("/");

currentMonth = Integer.parseInt(current[0]);

currentDay = Integer.parseInt(current[1]);

currentYear = Integer.parseInt(current[2]);

birthMonth = Integer.parseInt(birth[0]);

birthDay = Integer.parseInt(birth[1]);

birthYear = Integer.parseInt(birth[2]);

}

/\*\*

\* Calculates customer's age.

\*/

private void calculateAge() {

validateBirthday(); // check birthday is a legal date

age = currentYear - birthYear; // general age calculation

// if birthday hasn't happened yet this year, take 1 away from age

if (currentMonth < birthMonth

|| (currentMonth == birthMonth && currentDay < birthDay)) {

age--;

}

}

/\*\*

\* Checks if birthdays are legal dates based on the month. Exit transaction

\* on invalid birthday.

\*/

private void validateBirthday() {

if (birthMonth == 2) {

if (birthDay > 29 || (birthDay == 29 && !isLeapYear())) {

System.out.println("Invalid birthdate given.");

System.exit(-1);

}

} else if (birthMonth == 4 || birthMonth == 6

|| birthMonth == 9 || birthMonth == 11) {

if (birthDay > 30) {

System.out.println("Invalid birthdate given.");

System.exit(-1);

}

} else {

if (birthDay > 31) {

System.out.println("Invalid birthdate given.");

System.exit(-1);

}

}

}

/\*\*

\* Determines if a year is a leap year.

\* @return true if the year is a leap year, false otherwise

\*/

private boolean isLeapYear() {

return birthYear % 4 == 0

&& (birthYear % 400 == 0 || birthYear % 100 != 0);

}

/\*\*

\* Indicates whether a customer can rent games with given ratings based on

\* the customer's age.

\* @param ratings the ratings of the games to be rented

\*/

public void checkout(String[] ratings) {

// process each game customer is checking out

for (String gameRating : ratings) {

System.out.println("Scan Game with Rating: " + gameRating);

if (gameRating.equals("E10")) {

if (age < 10) {

System.out.println("Rental Rejected");

} else {

System.out.println("Rental Accepted");

}

} else if (gameRating.equals("T")) {

if (age < 13) {

System.out.println("Rental Rejected");

} else {

System.out.println("Rental Accepted");

}

} else if (gameRating.equals("M")) {

if (age < 17) {

System.out.println("Rental Rejected");

} else {

System.out.println("Rental Accepted");

}

} else if (gameRating.equals("AO")) {

if (age < 18) {

System.out.println("Rental Rejected");

} else {

System.out.println("Rental Accepted");

}

} else {

System.out.println("Rental Accepted");

}

}

}

}

**Source Code (testing class)**

package ceg3110project2;

import java.util.Scanner;

/\*\*

\* @author Daniel -- Testing class for RentalTransaction

\*/

public class CEG3110Project2 {

/\*\*

\* @param args the command line arguments

\*/

public static void main(String[] args) {

String todaysDate, birthDate;

String[] ratingCodes;

Scanner keyboard = new Scanner(System.in);

System.out.println("Please enter today's date, followed by the customer's"

+ " birthdate.");

todaysDate = keyboard.next();

birthDate = keyboard.next();

keyboard.nextLine(); // clear input buffer

System.out.print("Please enter rental codes now: ");

ratingCodes = keyboard.nextLine().split(" ");

// test functionality of having a single customer scan many games

RentalTransaction r1 = new RentalTransaction(todaysDate, birthDate);

r1.checkout(ratingCodes);

}

}