**Main**

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Chad Scies, Luke Bowman, Daniel Stebbins

This project is our own work, C.S., L.B., D.S.

This is the main of the project that calculates which kid gets which present based on file reading. It outputs the finished list to the file "List".

Things that went right: It got done! All members contributed.

Things that went wrong: Connecting parts from different members could have been smoother and required extra work.

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import java.io.\*;

import java.util.Scanner;

import java.util.ArrayList;

import java.util.Random;

public class Christmas

{

public static void main(String[] args) throws IOException

{

//Chad - File output

final String FILENAME = "List.txt";

//Daniel - ArrayLists and FileIO.

//Raw gift file input.

ArrayList<Gift> gifts = new ArrayList<Gift>();

//Final gifts (Parallel with the kids array).

ArrayList<Gift> finalGifts = new ArrayList<Gift>();

//Raw kids file input.

ArrayList<Kids> kids = new ArrayList<Kids>();

//Declaring scanner

Scanner reader = new Scanner(System.in);

//Chad - User input

int daysTillChrist;

double budget = 0.00;

System.out.println("How many days till Christmas?");

daysTillChrist = reader.nextInt();

System.out.println("What's your budget?");

budget = reader.nextDouble();

//Calling methods for file input and removing older naughty kids.

giftReader(gifts);

kidReader(kids);

removeKids(kids);

double amountPerKid = budget/kids.size();

//Checking to see if the values are low enough to crash the program

if(amountPerKid < 4.99 || daysTillChrist < 3)

{

System.out.println("NO GIFTS!");

}

else

{

//Method to remove gifts that are too expensive or time consuming.

removeGifts(kids, gifts, budget, daysTillChrist, amountPerKid);

//Method that matches each kid with a narrowed down arraylist of possible gifts.

kidGifts(kids, gifts, finalGifts, budget);

//Method to print final list to a file.

fileOutput(budget, FILENAME, kids, finalGifts);

}

}

//Daniel - reading in gifts (Takes gift ArrayList and returns it full).

public static void giftReader(ArrayList<Gift> g) throws FileNotFoundException

{

Scanner fileReader1 = new Scanner(new File("Gifts.txt"));

while(fileReader1.hasNextLine())

{

//Super dumb way of circumvent the .nextInt line problem. Reads in name, low age, high age, price, and day amount and creates a gift object.

g.add(new Gift(fileReader1.nextLine(),

Integer.parseInt(fileReader1.nextLine()),

Integer.parseInt(fileReader1.nextLine()),

Double.parseDouble(fileReader1.nextLine()),

Integer.parseInt(fileReader1.nextLine())));

}

}

//Daniel - reading in kids (Takes kids ArrayList and returns it full).

public static void kidReader(ArrayList<Kids> k) throws FileNotFoundException

{

Scanner fileReader2 = new Scanner(new File("Kids.txt"));

while(fileReader2.hasNextLine())

{

//One line from the file to be worked on.

String current = fileReader2.nextLine();

//Finding name using the substring left of the first comma.

int firstComma = current.indexOf(",");

String name = current.substring(0, firstComma);

//Niceness found using substring first comma to second comma.

int secondComma = current.lastIndexOf(",");

String niceness = current.substring(firstComma + 2, secondComma);

//Turning string niceness into a boolean value.

boolean nice = false;

if(niceness.equals("nice"))

nice = true;

else

nice = false;

//Finding age using substring left of the second comma.

int age = Integer.parseInt(current.substring(secondComma + 2));

//Creating a new Kids object.

k.add(new Kids(name, nice, age));

}

}

//Chad and Luke - remove kids based on age and behavior

public static void removeKids(ArrayList<Kids> k)

{

//Avoiding concurrent modification exception with a separate ArrayList as a marker.

ArrayList<Kids> toRemove = new ArrayList<Kids>();

//Looping through every kid.

for(Kids x: k)

{

//Marking kids who are too old and naughty.

if (x.getAge() >= 15 && x.getBehavior() == false)

toRemove.add(x);

}

//Removing the marked ones

k.removeAll(toRemove);

}

//Chad and Luke - removes gifts based on price and days to build

//a = amountPerKid d = daysTillChrist b = budget

public static void removeGifts(ArrayList<Kids> k, ArrayList<Gift> g, double b, int d, double a)

{

//Declarations

double range = 0, amountPerKidLow = 0;

ArrayList<Gift> toRemove = new ArrayList<Gift>();

toRemove.addAll(g);

range = a \* .3;

amountPerKidLow = a - range;

//Requires at least 3 gifts to choose from to avoid empty sets for kids.

while(toRemove.size() >= g.size() - 2)

{

toRemove.clear();

for(Gift gift: g)

{

//If a gift is too expensive, too far bellow the budget, or takes too many days, remove it.

if (gift.getPrice() > a || gift.getPrice() < amountPerKidLow || gift.getDays() > d)

{

toRemove.add(gift);

}

}

//Widens the price range with each loop to ensure there are enough gifts to choose from.

amountPerKidLow -= 10;

a += range;

}

g.removeAll(toRemove);

}

//Daniel - narrows down gifts for each kid based on age range.

public static void kidGifts(ArrayList<Kids> k, ArrayList<Gift> g, ArrayList<Gift> fG, double b)

{

int left = k.size();

for(Kids a: k)

{

//Copy of the gift list to be narrowed down for each kid.

ArrayList<Gift> currentGifts = new ArrayList<Gift>();

currentGifts.addAll(g);

ArrayList<Gift> toRemove = new ArrayList<Gift>();

int age = a.getAge();

//Removing gifts based on age.

for(Gift c: currentGifts)

{

if(age > c.getHighAge() || age < c.getLowAge())

{

toRemove.add(c);

}

}

currentGifts.removeAll(toRemove);

//Getting a gift from the arraylist and adding it as the final gift for the kid.

Gift temp = randGift(currentGifts, b, left);

fG.add(temp);

//Calculating new budget after subtracting the cost of the gift.

b -= temp.getPrice();

//Decrementing number of kids left.

left--;

}

}

//Chad and Luke - Picks a random gift from the list of gifts that can be given to one kid - takes the currentGift list for a kid, the budget, and how many kids are left.

public static Gift randGift(ArrayList<Gift> cG, double cB, int l)

{

//Calculating gift with maximum and minimum price in the list.

double max = 0, min = 10000;

int maxIndex = 0, minIndex = 0;

for(int i = 0; i < cG.size(); i++)

{

if(cG.get(i).getPrice() > max)

{

max = cG.get(i).getPrice();

maxIndex = i;

}

if(cG.get(i).getPrice() < min)

{

min = cG.get(i).getPrice();

minIndex = i;

}

}

//Defaulting to the most or least expensive gift to balance the budget as needed - picks a random one if not needed.

if(max \* .98 < cB / l)

{

return cG.get(maxIndex);

}

else if(min \* 1.4 > cB / l)

{

return cG.get(minIndex);

}

else

{

Random rand = new Random();

int number = rand.nextInt(cG.size());

return cG.get(number);

}

}

//Daniel - Returns the price of all the final gifts combined.

public static double checkPrice(ArrayList<Gift> fG)

{

double total = 0;

//Loops through every gift.

for(Gift g: fG)

{

//Adds to a total.

total += g.getPrice();

}

return total;

}

//Chad - Outputs to file

public static void fileOutput(double b, String f, ArrayList<Kids> k, ArrayList<Gift> fG) throws IOException

{

//Declaring buffered Writer

BufferedWriter bw = new BufferedWriter(new FileWriter(f));

//Looping through every kid and every respective gift to print them

for(int i = 0; i < k.size(); i++)

{

String content = k.get(i).getName() + " gets " + fG.get(i).getName();

bw.write(content);

bw.flush();

bw.newLine();

}

double underBudget = b - checkPrice(fG);

//Printing budget information

bw.newLine();

bw.write("The total amount spent was: $" + String.format("%.2f", checkPrice(fG)) + ". The cost was: $" + String.format("%.2f", underBudget) + " below budget");

bw.flush();

//End of program announcement.

System.out.println("List of which kid gets which gift exported to the file: \"List\"\nMerry Christmas!");

}

}

**Kids Class**

/\*

Chad Scies, Luke Bowman, Daniel Stebbins

This project is our own work, C.S., L.B., D.S.

This is the class to hold values for the kids file.

This class was made entirely by Luke, except the toString, which was Daniel.

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public class Kids

{

String name = "";

boolean behavior;

int age = 0;

public Kids(String n, boolean b, int a)

{

name = n;

behavior = b;

age = a;

}

public String getName()

{

return name;

}

public boolean getBehavior()

{

return behavior;

}

public int getAge()

{

return age;

}

public String toString()

{

String out = "\nName: " + name;

out += "\tNice? " + behavior;

out += "\tAge: " + age;

return out;

}

}

**Gift Class**

/\*

Chad Scies, Luke Bowman, Daniel Stebbins

This project is our own work, C.S., L.B., D.S.

This is the class to hold values for the gifts file.

This class was made by Daniel.

\*/

public class Gift

{

int lowAge, highAge, days;

double price;

String name;

public Gift(String n, int a1, int a2, double p, int d)

{

name = n;

lowAge = a1;

highAge = a2;

price = p;

days = d;

}

public int getLowAge()

{

return lowAge;

}

public int getHighAge()

{

return highAge;

}

public int getDays()

{

return days;

}

public double getPrice()

{

return price;

}

public String getName()

{

return name;

}

public String toString()

{

String out = "Name: " + name;

out += "\nLow Age: " + lowAge;

out += "\nHigh Age: " + highAge;

out += "\nPrice: " + price;

out += "\nDays: " + days;

return out;

}

}

**System Output – Never changes except for the user inputs**

How many days till Christmas?

5

What's your budget?

550.00

List of which kid gets which gift exported to the file: "List"

Merry Christmas!

**File Output: 5 days and 550.00 dollars**

Betty gets Book1

Dennis gets Book1

Mary gets Book1

Tyler gets Book1

Jennifer gets Book1

Luke gets Book1

Catherine gets Book1

Linda gets Book1

Nate5 gets Socks

Henry gets Socks

Troy gets Book1

Jessica gets Book1

Connie gets Book1

Dalia gets Socks

Sarah gets Book1

Jose gets Book1

Zachary gets Socks

James gets Book1

Kyle gets Book1

Ryan gets Socks

Arthur gets Book1

Lisa gets Book1

Eli gets Book1

Ashley gets Book1

John gets Socks

Lawrence gets Book1

Donna gets Book1

Isiah gets Socks

Robert gets Book1

Helen gets Socks

Jesse gets Book1

Sharon gets Socks

Kinsey gets Book1

Anna gets Socks

Michael gets Book1

Maya gets Socks

Rachel gets Book1

Billy gets Book1

Chad gets Socks

Richard gets Book1

Carolyn gets Socks

Dan5 gets Book1

Ralph gets Twister game

Aidan5 gets Socks

Dylan gets Book1

Joseph gets Book1

Lauren gets Socks

Louis gets Socks

Anthony gets Twister game

Cheryl gets Socks

Adam gets Socks

Noah gets Socks

Russell gets Book1

Thomas gets Socks

Andrea gets Socks

Jonas gets Book1

Jean gets Socks

Vincent gets Twister game

Aidan8 gets Socks

Logan gets Book1

Charles gets Socks

Mark gets Socks

Gloria gets Socks

Reese gets Socks

Brennan gets Socks

Marie gets Socks

Paul gets Hat and Mittens

Conner gets Socks

George gets Book1

Grace gets Book1

Nate8 gets Socks

Joshua gets Hat and Mittens

Beverly gets Socks

Dan8 gets Socks

Tim gets Book1

Melina gets Socks

Danielle gets Hat and Mittens

Gary gets Book1

Meredith gets Socks

Nicholas gets Book1

Eric gets Socks

Isaak gets Socks

Justin gets Book1

Kayla gets Hat and Mittens

Tiffany gets Socks

Lori gets Socks

Trent gets Socks

The total amount spent was: $549.13. The cost was: $0.87 below budget

**File Output: 5 days and 10000.00 dollars**

Betty gets Star Wars Droid Inventor

Dennis gets Star Wars Droid Inventor

Mary gets Star Wars Droid Inventor

Tyler gets Star Wars Droid Inventor

Jennifer gets Star Wars Droid Inventor

Luke gets Star Wars Droid Inventor

Catherine gets Star Wars Droid Inventor

Linda gets Wireless Earbud Headphones

Nate5 gets Star Wars Droid Inventor

Henry gets Wireless Earbud Headphones

Troy gets Wireless Earbud Headphones

Jessica gets Star Wars Droid Inventor

Connie gets Star Wars Droid Inventor

Dalia gets Star Wars Droid Inventor

Sarah gets Star Wars Droid Inventor

Jose gets Star Wars Droid Inventor

Zachary gets Wireless Earbud Headphones

James gets Star Wars Droid Inventor

Kyle gets Star Wars Droid Inventor

Ryan gets Wireless Earbud Headphones

Arthur gets Star Wars Droid Inventor

Lisa gets Star Wars Droid Inventor

Eli gets Star Wars Droid Inventor

Ashley gets Star Wars Droid Inventor

John gets Watch

Lawrence gets Star Wars Droid Inventor

Donna gets Star Wars Droid Inventor

Isiah gets Watch

Robert gets Star Wars Droid Inventor

Helen gets Wireless Earbud Headphones

Jesse gets Wireless Earbud Headphones

Sharon gets Wireless Earbud Headphones

Kinsey gets Wireless Earbud Headphones

Anna gets Wireless Earbud Headphones

Michael gets Star Wars Droid Inventor

Maya gets Wireless Earbud Headphones

Rachel gets Star Wars Droid Inventor

Billy gets Star Wars Droid Inventor

Chad gets Wireless Earbud Headphones

Richard gets Wireless Earbud Headphones

Carolyn gets Wireless Earbud Headphones

Dan5 gets Wireless Earbud Headphones

Ralph gets Star Wars Droid Inventor

Aidan5 gets Wireless Earbud Headphones

Dylan gets Star Wars Droid Inventor

Joseph gets Star Wars Droid Inventor

Lauren gets Wireless Earbud Headphones

Louis gets Wireless Earbud Headphones

Anthony gets Wireless Earbud Headphones

Cheryl gets Wireless Earbud Headphones

Adam gets Wireless Earbud Headphones

Noah gets Wireless Earbud Headphones

Russell gets Star Wars Droid Inventor

Thomas gets Wireless Earbud Headphones

Andrea gets Wireless Earbud Headphones

Jonas gets Wireless Earbud Headphones

Jean gets Wireless Earbud Headphones

Vincent gets Wireless Earbud Headphones

Aidan8 gets Wireless Earbud Headphones

Logan gets Wireless Earbud Headphones

Charles gets Star Wars Droid Inventor

Mark gets Star Wars Droid Inventor

Gloria gets Wireless Earbud Headphones

Reese gets Wireless Earbud Headphones

Brennan gets Wireless Earbud Headphones

Marie gets Wireless Earbud Headphones

Paul gets Wireless Earbud Headphones

Conner gets Wireless Earbud Headphones

George gets Star Wars Droid Inventor

Grace gets Star Wars Droid Inventor

Nate8 gets Wireless Earbud Headphones

Joshua gets Star Wars Droid Inventor

Beverly gets Wireless Earbud Headphones

Dan8 gets Wireless Earbud Headphones

Tim gets Star Wars Droid Inventor

Melina gets Wireless Earbud Headphones

Danielle gets Star Wars Droid Inventor

Gary gets Star Wars Droid Inventor

Meredith gets Wireless Earbud Headphones

Nicholas gets Star Wars Droid Inventor

Eric gets Wireless Earbud Headphones

Isaak gets Wireless Earbud Headphones

Justin gets Wireless Earbud Headphones

Kayla gets Star Wars Droid Inventor

Tiffany gets Wireless Earbud Headphones

Lori gets Wireless Earbud Headphones

Trent gets Wireless Earbud Headphones

The total amount spent was: $9219.13. The cost was: $780.87 below budget

**File Output: 16 days and 500.00 dollars**

Betty gets Book1

Dennis gets Book1

Mary gets Book1

Tyler gets Book1

Jennifer gets Book1

Luke gets Book1

Catherine gets Book1

Linda gets Book1

Nate5 gets Book2

Henry gets Book3

Troy gets Book1

Jessica gets Book1

Connie gets Book1

Dalia gets Book2

Sarah gets Book1

Jose gets Book1

Zachary gets Book3

James gets Book1

Kyle gets Book1

Ryan gets Book3

Arthur gets Book1

Lisa gets Book1

Eli gets Book1

Ashley gets Book1

John gets Book3

Lawrence gets Book1

Donna gets Book1

Isiah gets Book3

Robert gets Book1

Helen gets Book3

Jesse gets Book1

Sharon gets Book3

Kinsey gets Book1

Anna gets Book2

Michael gets Book1

Maya gets Book3

Rachel gets Book1

Billy gets Book1

Chad gets Book3

Richard gets Book1

Carolyn gets Book3

Dan5 gets Book1

Ralph gets Book1

Aidan5 gets Book2

Dylan gets Book1

Joseph gets Book1

Lauren gets Book3

Louis gets Book1

Anthony gets Book1

Cheryl gets Book3

Adam gets Book2

Noah gets Book3

Russell gets Book1

Thomas gets Book2

Andrea gets Book3

Jonas gets Book1

Jean gets Book3

Vincent gets Book1

Aidan8 gets Book2

Logan gets Book1

Charles gets Book1

Mark gets Book1

Gloria gets Book3

Reese gets Book2

Brennan gets Book2

Marie gets Book3

Paul gets Book1

Conner gets Book3

George gets Book1

Grace gets Book1

Nate8 gets Book2

Joshua gets Book1

Beverly gets Book3

Dan8 gets Book3

Tim gets Book1

Melina gets Book1

Danielle gets Book1

Gary gets Book1

Meredith gets Book2

Nicholas gets Book1

Eric gets Book3

Isaak gets Book3

Justin gets Socks

Kayla gets Socks

Tiffany gets Book3

Lori gets Book3

Trent gets Book3

The total amount spent was: $499.13. The cost was: $0.87 below budget

**File Output: 16 days and 136000.00 dollars**

Betty gets Puppy

Dennis gets Puppy

Mary gets Puppy

Tyler gets Puppy

Jennifer gets Puppy

Luke gets Puppy

Catherine gets Puppy

Linda gets Puppy

Nate5 gets Car

Henry gets Car

Troy gets Puppy

Jessica gets Puppy

Connie gets Puppy

Dalia gets Puppy

Sarah gets Puppy

Jose gets Puppy

Zachary gets Car

James gets Puppy

Kyle gets Puppy

Ryan gets Car

Arthur gets Puppy

Lisa gets Puppy

Eli gets Puppy

Ashley gets Puppy

John gets Car

Lawrence gets Puppy

Donna gets Puppy

Isiah gets Car

Robert gets Puppy

Helen gets Car

Jesse gets Puppy

Sharon gets Puppy

Kinsey gets Puppy

Anna gets Puppy

Michael gets Puppy

Maya gets Puppy

Rachel gets Puppy

Billy gets Puppy

Chad gets Puppy

Richard gets Puppy

Carolyn gets Car

Dan5 gets Puppy

Ralph gets Puppy

Aidan5 gets Car

Dylan gets Puppy

Joseph gets Puppy

Lauren gets Car

Louis gets Puppy

Anthony gets Puppy

Cheryl gets 55 Inch 4K TV

Adam gets Puppy

Noah gets Puppy

Russell gets Puppy

Thomas gets Car

Andrea gets Car

Jonas gets Puppy

Jean gets Car

Vincent gets Puppy

Aidan8 gets Car

Logan gets Puppy

Charles gets Puppy

Mark gets Puppy

Gloria gets 55 Inch 4K TV

Reese gets Puppy

Brennan gets Car

Marie gets Car

Paul gets Puppy

Conner gets Car

George gets Puppy

Grace gets Puppy

Nate8 gets Car

Joshua gets Puppy

Beverly gets Car

Dan8 gets Car

Tim gets Puppy

Melina gets Puppy

Danielle gets Puppy

Gary gets Puppy

Meredith gets Car

Nicholas gets Puppy

Eric gets Car

Isaak gets Car

Justin gets Puppy

Kayla gets Puppy

Tiffany gets Car

Lori gets Car

Trent gets Car

The total amount spent was: $119240.98. The cost was: $16759.02 below budget