Solution Midterm 1

CS 1323, Spring 2015

1. (10 points; 2 points each)

What type of data (int, double, String, char, or boolean) would you use to store each of the following things? Do not assume that each type is used exactly once.

* 1. The number of items on my list of things to do today.

int

* 1. Whether or not an item on my list of things to do has been completed.

boolean

* 1. A single item ( e.g. Buy dog food) on my list of things to do.

String

d) The priority of items on my list of things to do (H for high, M for medium, or L for low).

char (String also acceptable)

e) The average number of weeks that an item has been on my list of things to do.

double

1. (10 points; 2 points each) Each code fragment below has a variable x. Tell me **one type** (int, double, String, char or boolean) that the variable x could be legally declared. If the expression is illegal, say so.
   1. x = 5/3;

int or double

* 1. x = 2 – 4.7;

double

* 1. x = “A Tale of Two Cities”;

String

* 1. x = ‘3’;

char (int and double also accepted, but not great answers)

* 1. x = 2 + 3 / 4 – 7 \* (double)1;

double

1. (20 points; 2 points each part)

Give the value of each expression or assigned by each statement below. Show all intermediate steps to get partial credit. Each part is independent, with the values for any variables starting with the ones given below (do not use the results of a) in b), for example). If the expression is not legal in Java, say so.

Be sure to distinguish double and int values by **giving double values a decimal point**, even if it is a zero.

int size = 4;

double weight = 5.1;

String food = new String(“Hazel nuts”);

* 1. 9 - 5

4

* 1. 4 \* 2.5

10.0

* 1. 32 / 3

10

* 1. 27 % 4

3

* 1. size = size + 1;

5

* 1. size + weight + food

4 + 5.1 + “Hazel nuts”

4.0 + 5.1 + “Hazel nuts”

9.1 + “Hazel nuts”

“9.1Hazel nuts”

* 1. size = weight;

Illegal

* 1. weight = size;

4.0

* 1. 7 \* 4 / 12

28 / 12

2

* 1. 25 – 2 / 4

25 – 0

25

1. (5 points) I’m hosting a dinner party. Each friend will eat one chicken breast, except the friends who are vegan who will eat none. Chicken breasts come in packages that contain more than one. How many packages should I buy if I don’t want to run short?

int partyFriends; // the number of people coming to the party, value set elsewhere

int veganFriends; // the number of friends who are vegan, value set elsewhere

int breastsInPackage; // the number of chicken breasts in a package, value set elsewhere

int packagesOfChicken; // this is the variable you should set

packagesOfChicken = (int) Math.ceil ((partyFriends – veganFriends)/ (double) breastsInPackage);

// there are many other acceptable answers

1. (10 points) Write a ***code fragment*** that asks the user a few questions and makes a video game recommendation[[1]](#footnote-1) based on the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Want to Think?** | **Want to be Creative?** | **Have Quick Reflexes?** | **Game Recommendation** |
| No | Yes |  | Minecraft |
| No | No |  | Pac Man |
| Yes |  | Yes | Sonic the Hedgehog |
| Yes |  | No | World of Warcraft |

The following Scanner has been declared and previously constructed. You may abbreviate prompts to just one word (“Want to think” could become “Think”), but may not just use “Prompt”.

Scanner keyboard; // constructed elsewhere

String answer; // where answers from the user are stored

System.out.println(“Want to Think?”);

answer = keyboard.nextLine(); // next() OK too

if (answer.equalsIgnoreCase(“Yes”)) {

System.out.println(“Do you have quick reflexes”);

answer = keyboard.nextLine();

if (answer.equalsIgnoreCase(“Yes”)) {

System.out.println(“Play Sonic the HedgeHog”);

}

else {

System.out.println(“Play World of Warcraft”);

}

}

else {

System.out.println(“Do you want to be Creative?”);

answer = keyboard.nextLine();

if (answer.equalsIgnoreCase(“Yes”)) {

System.out.println(“Play Minecraft”);

}

else {

System.out.println(“Play Pac Man”);

}

}

1. (15 points) ***Trace the code fragments*** below in the tables at the right. If a loop is an infinite loop, trace three iterations and write “infinite loop” in the table.

a)

|  |
| --- |
| **size** |
| 7 |
| 12 |
| 14 |

int size = 7;

if (size > 3)

size = size + 5;

if (size < 10)

size = size – 2;

else

size = size + 2;

b)

|  |  |
| --- | --- |
| **data** | **count** |
| 3 | 5 |
| 6 | 3 |
| 7 | 1 |
| 6 | -1 |

int count = 5;

int data = 3;

while (count > 0)

{

count = count – 2;

data = data + count;

}

c)

|  |  |
| --- | --- |
| **count** | **size** |
| 2 | 10 |
| 3 | 3 |
| 4 | 0 |
| Infinite | Loop |

int count = 2;

int size = 10;

while (size >= 0)

{

count = count + 1;

size = size / count;

}

1. (30 points) Write a ***complete program*** that runs an e-commerce site for Sentinel Goods. At this time, they sell only three items, as listed in the table below. Users order by item number. You may assume that users always purchase at least one item.

|  |  |  |
| --- | --- | --- |
| **Item Number** | **Name** | **Cost** |
| A2345 | Dog Toys | 10.00 |
| B3456 | Dog Bowls | 20.00 |
| C4567 | Dog Beds | 30.00 |

The user interaction is shown below. Words in italics were output by the computer. Words in bold were entered by the user.

*Welcome to Sentinel Goods!*

*Enter your next item number or Quit if you have completed your purchase*

**A2345**

*How many would you like?*

**3**

*Enter your next item number or Quit if you have completed your purchase*

**D4321**

*How many would you like?*

**5**

*That is not a legal item number.*

*Enter your next item number or Quit if you have completed your purchase*

**B3456**

*How many would you like?*

**1**

*Enter your next item number or Quit if you have completed your purchase*

**A2345**

*How many would you like?*

**1**

*Enter your next item number or Quit if you have completed your purchase*

**Quit**

*You ordered:*

*4 Dog Toys*

*1 Dog Bed*

*Your purchase cost: $60.00.*

*Thank you for shopping with Sentinel Goods!*

**import** java.util.Scanner; // No points for this

**public** **class** SentinelGoods

{

/\*\* This program sells one of three dog related items to a consumer.

\*

\* **@param** args There are no command line arguments

\*/

**public** **static** **void** main(String[] args)

{

Scanner input = **new** Scanner(System.***in***);

**int** toysSold = 0;

**int** dishesSold = 0;

**int** bedsSold = 0;

System.***out***.println("Welcome to Sentinel Goods!");

// Priming read

System.***out***.println("Enter your next item number or "

+ "Quit if you have completed your purchase");

String item = input.next();

// Let the customer order as often as they want

**while** (!item.equalsIgnoreCase("Quit"))

{

// It would be nicer to do this after we know the item

// number is legal.

System.***out***.println("How many would you like?");

**int** quantity = input.nextInt();

**if** (item.equals("A2345"))

{

toysSold += quantity;

}

**else** **if** (item.equals("B3456"))

{

dishesSold += quantity;

}

**else** **if** (item.equals("C4567"))

{

bedsSold += quantity;

}

**else**

{

System.***out***.println("That is not a legal item number");

}

// Priming read

System.***out***.println("Enter your next item number or "

+ "Quit if you have cmopleted your purchase");

item = input.next();

} // end while

// Summarize the order

System.***out***.println("You ordered");

**double** price = 0.0;

**if** (toysSold > 0)

{

System.***out***.println(toysSold + " Dog Toy(s)");

price += toysSold \* 10.00;

}

**if** (dishesSold > 0)

{

System.***out***.println(dishesSold + " Dog Dish(es)");

price += dishesSold \* 20.00;

}

**if** (bedsSold > 0)

{

System.***out***.println(bedsSold + " Dog Bed(s)");

price += bedsSold \* 30.00;

}

System.***out***.println("Your purchase cost $" + price);

System.***out***.println("Thank you for shopping with Sentinel Goods!");

input.close();

} // end main

} // end class

1. Inspired by: https://games.yahoo.com/news/next-favorite-video-game-one-easy-chart-000016895.html [↑](#footnote-ref-1)