Store Discount Project

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**Challenge to Students:** A clothing store has asked you to reprogram their cash register to handle a sale they will be having this Saturday. The sale will give customers 30% off the regular store price. However, the store manager informs you that preferred customers, who are frequent shoppers, were emailed a store coupon last week for an additional 20%. As a new programmer working for the company your boss would like you to first write out the procedural steps of this program so that he can make comments before you begin the programming process. Once you have had your pseudocode checked, you should develop the program, debug it through repeated testing and then test it on one of the store’s cash registers before deploying it to other registers in the store.

**National / State Technology Standards**

**Time:** 4 class periods

**Deliverables:** Computer program that calculates a discount based on a sale and a coupon

**Understandings**

* Computers are calculators
* Computers rely on a set of procedures to make calculations

**Essential Questions**

* What is an operator?
* What is a variable?

**Performance Tasks:**

|  |  |
| --- | --- |
| **Task** | **Time** |
| Inform students of the project, understandings and essential questions | Day 1: 5-10 minutes |
| Hook students with a brainteaser using numbers | Day 1: 15-20 minutes |
| Ask students to write down what happens at a cash register during a store sale, then share and discuss with a partner (Think, Pair Share) | Day 1: 20-30 minutes |
| Use an interactive board to collaboratively write the psudocode for a sale operation at a store. | Day 2: 30 minutes |
| Ask students to research the code for the needed functions, using <http://docs.phython/tutorials>Add suspected needed code to project wiki pageAsk 2-3 students to present their code and explain | Day 2: Homework, 10-15 minutes |
| Work individually to program the sale procedure. | Day 2 through Day 3 |
| Use a wiki to post code samples. Have students to peer review at least 2 other code examples and make suggestions | Day 3: Homework |
| Once programs are working, bring them up in the computer lab and allow students to role play a store sale to beta test each other’s programs. Use a Flip Video camera to film a couple of the role playing scenarios and post the video to the project site. | Day 4: 30 minutes |
| Take a unit quiz. | Day 4: 30 minutes |

Rubric: Store Discount Project

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- |
| **Item** | **Points Possible** | **Points Earned** |
| Student has written psudocode for the program to help understand the steps a cashier goes through to enter the cost and calculate the sale price. | 5 |  |
| Program is functional and returns no errors | 5 |  |
| Program has comments that helps another programmer understand how the program works | 3 |  |
| Program code has been shared on the wiki | 2 |  |
| Student has peer reviewed at least two other programs and made constructive comments | 5 |  |
| Student has beta tested the program with at least 3 customers (students) | 5 |  |
| **Total** | 25 pts. |  |

**Notes to Teacher:** This computer program was adapted from the calculation problem given on the second day of the Beginning Programming Course at GA Tech. The activity asked the user to have Python calculate the store discount on an item that costs $45. This example asks the student to adapt that problem to allow the store operator to enter a sale price, rather than just relying on a set price of $45. This project also requires the store operator to ask the customer if they have a store coupon. Many stores mail out coupons for 20% to preferred customers. If the customer has a store coupon, the cashier should be able to enter a “yes” or “no”. If the customer has a store coupon, they will get a store discount of 30% and then an additional discount of 20% from the sale price.

**One Possible Answer**

def storeDiscount():

 newPrice = requestNumber("Enter a Price: ")

 disCount = .3 \* newPrice

 haveCoupon = requestString("Does the customer have a coupon?: ")

 if haveCoupon == "yes":

 salePrice = newPrice - disCount

 newDiscount = salePrice \* .2

 finalPrice = salePrice - newDiscount

 print "$" + str(finalPrice)

 else:

 print "$" + str(disCount)

**Programming Unit I Quiz: Basic Calculations**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Use the programming code below to answer the following questions. Your answer should be clear, concise and free of spelling and grammatical errors.

**Store Discount Program**

def storeDiscount():

 newPrice = requestNumber("Enter a Price: ")

 disCount = .3 \* newPrice

 haveCoupon = requestString("Does the customer have a coupon?: ")

 if haveCoupon == "yes":

 salePrice = newPrice - disCount

 newDiscount = salePrice \* .2

 finalPrice = salePrice - newDiscount

 print "$" + str(finalPrice)

 else:

 print "$" + str(disCount)

1. In the code above identify one variable. Define the term “variable” and explain its importance in the development of computer programming. (3 points)
2. Explain why the programmer used the function “Str”? What information is returned by this function? (2 pts.)
3. Use the code above to write out the steps (pseudocode) associated with this program. Where do you believe the programmer should have annotated their program with comments? Explain. (5 pts.)
4. How would you rewrite the code so that the cost of the item included state sales tax? You may use the back for your answer. (5 pts.)
5. Would it be better for the program to automatically include state sales tax or allow the cashier to input the tax? Explain. (3 pts.)
6. Based on your experience with using a cash register, suggest one improvement for this program. Support your suggestion with at least one specific example. (2 pts.)

TOTAL: 20 pts.