Computer Science 1081 – Assignment #04

Program #1

Write a program that asks the user to enter a number within the range of 1 through 10. Use a switch statement to display the Roman numeral version of that number. Do not accept a number less than 1 or greater than 10.

- Use a *switch* statement
- Make sure that you tell the user if their input is not accepted

Sample Outputs:

```
Enter a number (1-10): 5
The Roman numeral version of 5 is V
Press any key to continue . . .

=====================================

Enter a number (1-10): 15
Enter a number in the range 1 through 10
Press any key to continue . . .
```

Program #2

A software company sells a package that retails for $99. Quantity discounts are given according to the following table:

Quantity	Discount
10-19	20%
20-49	30%
50-99	40%
100 or more	50%

Write a program that asks for the number of units sold and computes the total cost of the purchase. Make sure the number of units is greater than 0.

- Use only the *if* statement, don't use a *switch* or *else* block
- **Note:** the auto-checker on this program does take some time (a few seconds on the college's computers) to process the code checks

Sample Outputs:

```
How many units were sold? 48
The total cost of the purchase is $3326.40
Press any key to continue . . .

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How many units were sold? -1
Error: Units sold must be positive integer
Press any key to continue . . .
```

Test the boundaries: does the result match expectations when you are 1 unit below, and 1 unit above the threshold (e.g. Quantity 9 and 10, getting the correct discount values)

Program #3

A bank charges $10 per month plus the following check fees for a commercial checking account:

$0.10 each for fewer than 20 checks

$0.08 each for 20-39 checks

$0.06 each for 40-59 checks

$0.04 each for 60 or more checks

The bank also charges an extra $15 if the balance of the account falls below $400 (before any check fees are applied). Write a program that asks for the beginning balance and the number of checks written. Compute and display the bank's service fees for the month. Do not accept a negative value for the number of checks written. If a negative value is given for the beginning balance, display and urgent message indicating the account is overdrawn.

- Use only the *if* statement
- No message needs to be displayed if the account balance falls below the $400 threshold, just add the appropriate fee into the total.
- For the overdrawn balance portion of the problem, determine if the fee will overdraw the account. However, display the message about overdrawing the account before displaying what the fees are. For example, if the account has $9.99 and the fees will total to $10, the account will be overdrawn.

Sample Outputs:

```
Enter the following information about your checking account
Beginning balance: $1562
Number of checks written: 20
The bank fee this month is $11.60
Press any key to continue . . .

=======================================

Enter the following information about your checking account
Beginning balance: $10
Number of checks written: 2
Your account is overdrawn!
The bank fee this month is $25.20
Press any key to continue . . .
```

Program #4

Write a program that displays the following menu (see below).

- If the user enters 1, the program should ask for the radius of the circle and then display its area. Use the formula area = pi*r^2. Use 3.14159 for pi and the radius of the circle for r.

- If the user enters 2, the program should ask for the length and width of the rectangle and then display he rectangle's area. Use the formula area = length * width.

- If the user enters 3, the program should ask for the length of the triangle's base and its height, and then display is area. Use the formula area = base * height * (1/2).

- If the user enters 4, the program should end

- Display an error message if the user enters a number outside the range of 1 through 4 when selecting an item from the menu. Do not accept negative values for the circle's radius, the rectangle's length or width, or the triangle's base or height.

- Use a *switch* statement to evaluate the user menu choice
- Do input validation for the correct menu choice
- Define Pi as a constant to 5 decimal places (3.14159)

Sample Outputs:

```
Geometry Calculator

1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit
Enter your choice (1-4): 1
Enter the Radius: 5
The area is: 78.5397
Press any key to continue . . .
```

```
Geometry Calculator

1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit
Enter your choice (1-4): 2
Enter the length: 5
Enter the width: 4
The area is: 20
Press any key to continue . . .
```

```
Geometry Calculator

1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit
Enter your choice (1-4): 3
Enter the base: 6
Enter the height: 4
The area is: 12
Press any key to continue . . .
```

```
Geometry Calculator

1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit
Enter your choice (1-4): 4
Exiting
Press any key to continue . . .
```

```
=====================================

Geometry Calculator

1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit
Enter your choice (1-4): 5
You must choose from the a listed
option
Press any key to continue . . .
```