CSCE 145: Algorithmic Design I

Lab – 5

Problem:

- A chocolate bar at a local vending machine costs $1.
- Each chocolate bar has 1 coupon in it.
- We can redeem 6 coupons for 1 chocolate bar.
- Example: If Sam has $6 dollars,
  - $6 → can be used to buy 6 chocolate bars. Sam will also get 6 coupons.
  - 6 coupons → can be used to buy the 7^{th} chocolate bar.
  - Sam will now have 7 chocolate bars and 1 coupon left.
- How many chocolate bars can be purchased and eaten from the vending machine if we start with X dollars and always redeem coupons if we have enough for an additional chocolate bar ?

Task:

- Write a Java program that calculates the
  - total # of chocolate bars the user can buy and
  - # of coupons remaining

Instructions:

- Prompt the user to enter the purchase amount
- Use a loop that continues to redeem coupons as long as there are enough to get at least one chocolate bar.

Sample Output - 1

How many dollars would you like to spend on chocolate from the vending machine?

12

You can buy 14 chocolate bars and will have 2 coupons left!

Sample Output - 2

How many dollars would you like to spend on chocolate from the vending machine?

-4

Invalid value for amount! Exiting the program!

Lab Submission:

- At the beginning of your program, insert your full name as a comment.
- Include comments in your program wherever necessary.
- Upload the .java file on Dropbox.

Lab Report Submission:

- First, download the Lab Report Template document on Dropbox.
- Use this template to complete your lab report.
- Proposed Solution:
  - In the proposed solution section of your lab report, draw a flow chart based on your lab solution.
    - Make sure to put decisions in diamonds, actions/statements in boxes, and draw arrows showing the flow of the program.
    - Arrows coming from decisions must have the “TRUE” and “FALSE” branches clearly labeled.
- Additional Questions:

1. (1 pt) When the condition is false: the body of a do-while loop runs _____ times.
2. (4 pts) What causes an infinite loop? How can infinite loops be avoided?
3. (5 pts) How is a while loop different from a do-while loop?
4. (5 pts) Given the following code snippet, what will the program print to the console?

```
int count = 1;
while(count < 10)
{
        System.out.print(count+"\t");
        count++;
}
```

5. (5 pts) Revise the following code snippet so that it uses a do-while loop instead of a while loop.

```
int count = 0;
while(count <= 15)
{
        System.out.println(count);
        count += 3;
}
```