**Assignment #3**

**DeadLine:14th October,2016**

**Question #1:**

You often need to convert Rupees into coins of 5, 2, and 1. You task is to develop a C++ program to compute a mix of coins of 5, 2 and 1 against the given amount of money. Remember that you may not always have enough coins. So the program should be able to covert the money into the coins available. For example, if you don’t have the coins of 5-rupees, then for 7 rupees the program should compute a mix of 2-rupees and 1-rupee coins. The program should also take as input the number of 5-rupees, 2-rupees and 1-rupee coins available. The program should display the amount of money in terms of numbers of 5-rupees coins, 2-rupees coins and 1-rupee coins if possible with the available set of coins. Otherwise print the message “Sorry!! No such combination exists.

**Question #2:**

People who deal with historical dates use a number called the Julian day to calculate the number of days between two events. The Julian day is the number of days that have elapsed since January 1, 4713 B.C. For example, the Julian day for October 16, 1956, is 2435763.

There are formulas for computing the Julian day from a given date, and vice versa. One very simple formula computes the day of the week from a given Julian day:

Day of the week = (Julian day + 1) % 7 where % is the Java modulus operator. This formula gives a result of 0 for Sunday, 1 for Monday, and so on, up to 6 for Saturday. For Julian day 2435763, the result is 2 (Tuesday). Your job is to write a C++ program that requests and inputs a Julian day, computes the day of the week using the formula, and then displays the name of the day that corresponds to that number.

**Question #3:**

A bank in your town updates its customers’ accounts at the end of each month.The bank offers two types of accounts: savings and checking. Every customer must maintain a minimum balance. If a customer’s balance falls below the minimum balance, there is a service charge of $10.00 for savings accounts and $25.00 for checking accounts. If the balance at the end of the month is at least the minimum balance, the account receives interest as follows:

a. Savings accounts receive 4% interest.

b. Checking accounts with balances of up to $5,000 more than the minimum balance receive 3% interest; otherwise, the interest is 5%.

Write a program that reads a customer’s account number (int type), account type (char; s for savings, c for checking), minimum balance that the account should maintain, and current balance. The program should then output the account number, account type, current balance, and an appropriate message. Test your program by running it five times, using the following data:

46728 S 1000 2700

87324 C 1500 7689

79873 S 1000 800

89832 C 2000 3000

98322 C 1000 750

**Question #4:**

Four prisoners are arrested for a crime, but the jail is full and the jailer has nowhere to put them. He eventually comes up with the solution of giving them a puzzle so if they succeed they can go free but if they fail they are executed.

The jailer puts three of the men sitting in a line. The fourth man is put behind a screen (or in a separate room). He gives all four men party hats. The jailer explains that there are two black and two white hats; that each prisoner is wearing one of the hats; and that each of the prisoners is only to see the hats in front of them but not on themselves or behind. The fourth man behind the screen can’t see or be seen by any other prisoner. No communication between the prisoners is allowed.  
If any prisoner can figure out and say to the jailer what color hat he has on his head all four prisoners go free. If any prisoner suggests an incorrect answer, all four prisoners are executed. The puzzle is to find how the prisoners can escape, regardless of how the jailer distributes the hats.