**Day.10**

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| Multithreaded programs, Thread class and Runnable interface |
| Thread synchronization - wait, notify and notifyAll |
| Interthread communication |

**Q1**) The main method waits to get input from the users until it is terminated. The input that it receives is any string. As soon as the main method receives the input it delegates the assignment of creating a password to a thread. The thread generates a random number and appends this number to the string that is passed and displays the password. Write a java program to do this.

**Hint** : Use java.util.Random class to generate random numbers.

**Q2**) A prompt asking a question appears for which user is given 1 minute. If user answers the question before 1 minute then “Congratulations!” is displayed. Otherwise “Better Luck Next Time” is displayed.

Write a program to implement the above scenario.

**Q3**) Write an application to simulate the vehicles crossing a bridge and a toll plaza on a highway. For the purpose of this exercise, simulate the environment for five vehicles that are approaching the bridge and the toll booth. The vehicles are numbered from one to five. The vehicles should approach the bridge and the toll booth in sequential order. The toll booth can only deal with one vehicle at a time. This application should print a message every time when a vehicle crosses the bridge and another message when a vehicle crosses the toll booth along with the vehicle number.

**Q4**) Write a bank class that has an array of account objects. The method transfer allows transfer of money from one account to another account. Using the hints to avoid deadlocks from the previous slide implement the transfer method.

**Q5**) Test the application by creating two threads that simultaneously transfers money form accounts 11111111 to account 22222222 and vice versa.

**Q6**) Consider the following scenario. Whenever a hen lays an egg its owner sells the egg to a shop. In the last 4 months the owner has gained Rs. 100 by selling eggs in the rate of Rs.2 per egg. Display the following messages

Hen Laid the Egg – 1

Owner gained Rs 2

Hen Laid the Egg – 2

Owner gained Rs 4

…

… So on.

Q7)

a. Write a program to create a fixed size thread pool. Write a program to execute 100 jobs(threads) with 5 jobs running in parallel.

b. Write a program to exibit the Fork and join case.

c. Write a program to schedule a thread to execute at 2 am every day.

d. Write a program to exibit the producer and consumer problem with threads.