Question 1: (20 points)

1. Concept Application: Suppose a linked list contains following topics of the CS projects. Write the steps to delete the “E-learning at School” from this list by showing • the position of the pointer and the status of the linked list after every step.

What are the steps used to delete the Node “E-learning at School”:

ANSWER :

1. Suppose the helpPtr equals Head .

>> (helpPtr = Head)

1. Create while loop that stop when the next of helpPtr equals null .

>> while(helpPtr.getNext() != null)

1. Create if statement inside the loop that cheack whether the topic inside the node is the one I want to delete .

>> if(helpPtr.getNext().getTopic() == " E-learning at School " )

1. Then The predecessor of the deleted node "the Change Science of Machine Learning" must point to the deleted nodes successor" Big Data in Health Care".

>> helpPtr.setNext (helpPtr.getNext().getNext() )

1. So we save the address of Node " Big Data in Health Care" into “next” of Node " the Change Science of Machine Learning ".
2. Then node " E-learning at School" is deleted by Java garbage collector .

**After Delete node " E-learning at School" :**

Head

The Change Science of Machine Learning

Big Data in Health Care

v

Machine Readable Label Reader System for Articles

Learning to filter news

How the machine thinks

intelligent learning

null

Question 2:(20 points)

1. Algorithm Write up: Suppose a linked list contains Student ID, CS courses, and current status. Write an algorithm which must check and print whether the student complete the minimum requirements to register in a senior project. While the student ID and the CS course contains string values, and current status contains a flag ‘1’ if the student completes the course or ‘0’ if the student did not complete the course.

The output of the algorithm should be The student ID:1723 has not completed the requirements.

ANSWER :

**Algorithm :**

For each student

if(current status for each courses == 1)

then the student id 1723 has completed the requirements .

else

The student id 1723 has not completed the requirements.

End if .

**Input:**

LinkedList (Student ID : int , CS courses : int[] , current status : Boolean)

**Output:**

>> The student ID:1723 has not completed the requirements.

Or

>> The student ID:1723 has completed the requirements.

**Method :**

private boolean CheckCourse(student headStd, String ID) {

student helpPtr = headStd;

while (helpPtr != null) {

if (helpPtr.getStudentID().compareTo(ID) == 0) {

int[] coursesArr = helpPtr.getCourse();

for (int i = 0; i < coursesArr.length; i++) {

if (coursesArr[i] == 0) {

return false;

}

}

return true;

}

helpPtr = helpPtr.getNext();

}

return false;

}