Karadeniz Technical University
Department of Computer Engineering
Lecturer Omer CAKIR

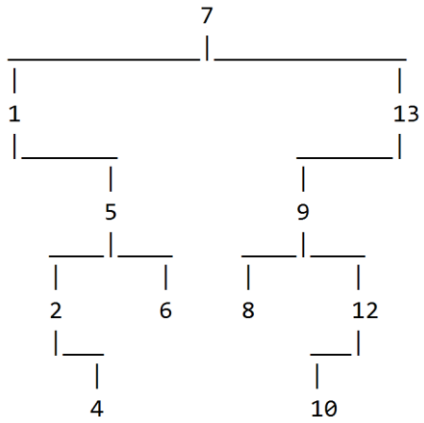
COM 205 Data Structures
Final Exam, 01.02.2015, 15:00, D-1, D-8
Time : **90** Minutes

NUMBER : ..... **NAME :** .....

Rules to be Obeyed During the Exam **SIGNATURE :** .....

EXAM GRADE	
[.....]	.....

1. Cell phones are not allowed to be used as a calculator or a watch. They must be switched off and placed in the pocket.
2. Brief information about the exam will be given at the begining, then no one is not allowed to ask a question during the exam.
3. Do not to forget to sign this paper after writing your number and name.



1. Insert **3** into the splay tree above. **(30P)**

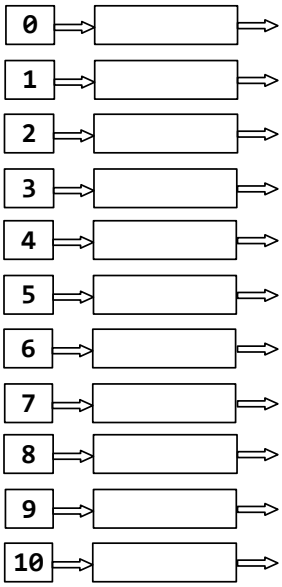
```
int Hash (char* key)
{
  int sum = 0;
  for (int j=0; j<4; j += 2)
    sum += 4*key[j] + key[j+1];

  sum = sum % 11 ;
  return sum;
}
```

dictionary.txt

list	liste
nuts	findik
object	nesne
order	duzen
parent	baba
queue	kuyruk
stack	yigin
tree	agac

2. Write words from `dictionary.txt` to `relative.txt` using `Hash()` function to calculate relative addresses and linear probing as a collision resolving method. In addition, add related words to linked lists using synonym chaining method. **(30P)**

relative.txt		a-97	n-110
0		b-98	o-111
1		c-99	p-112
2		d-100	q-113
3		e-101	r-114
4		f-102	s-115
5		g-103	t-116
6		h-104	u-117
7		i-105	v-118
8		j-106	w-119
9		k-107	x-120
10		l-108	y-121
ASCII Table →		m-109	z-122



```
bool empty()
{
   return (header->next == trailer);
}

void addFront(const int& i)
{
   add(header->next, i);
}

void add(DoublyNode* v, int& i)
{
   DoublyNode* u      = new DoublyNode;
   u->score           = i;
   .....
   .....
   .....
   .....
}

void main()
{
   DoublyLinkedList list;
   list.addFront(750);
   list.addFront(720);
}
```

3. Taking into account the lines represented by ..... in the function **add()** answer the following choices :

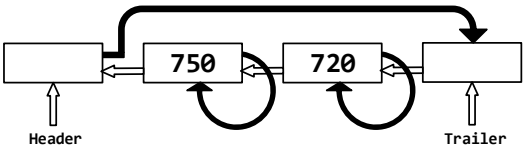
i) (20P) *(You'll loose 5Ps from wrong answer)*

If the lines are like these

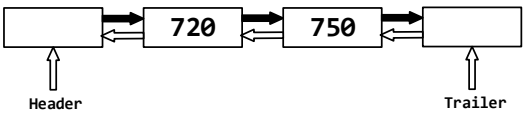
```
v->prev->next    = u;
v->prev          = u;
u->prev          = v->prev;
u->next          = v;
```

the linked list will be :

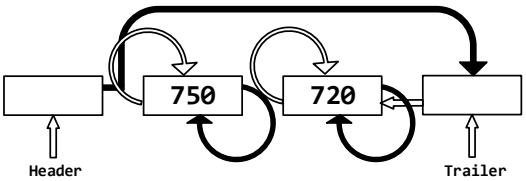
(A)



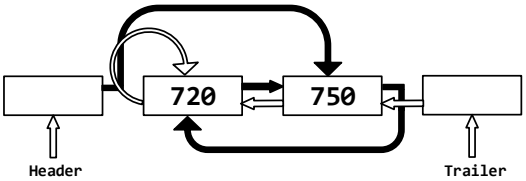
(B)



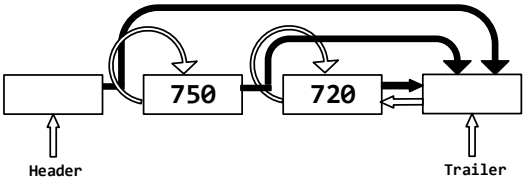
(C)



(D)



(E)



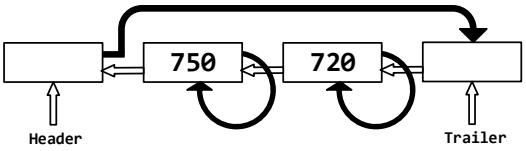
ii) (20P) *(You'll loose 5Ps from wrong answer)*

If the lines are like these

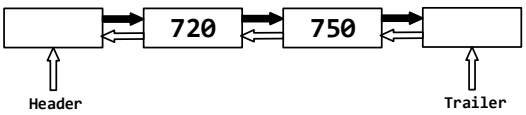
```
v->prev          = u;
v->prev->next    = u;
u->prev          = v->prev;
u->next          = v;
```

the linked list will be :

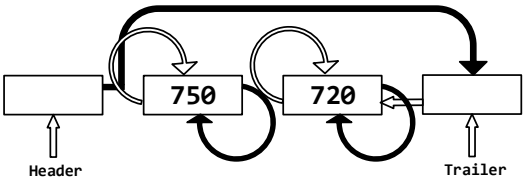
(A)



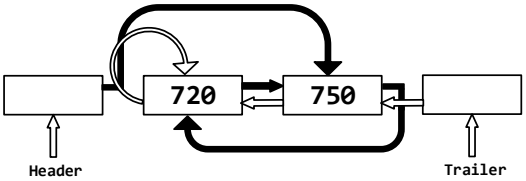
(B)



(C)



(D)



(E)