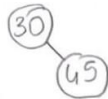Zeynep Selcen Öztunç
21902941
Section 01

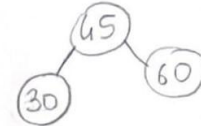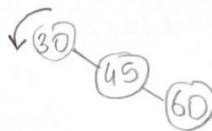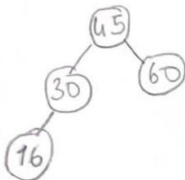# CS 202 - Homework Assignment 03

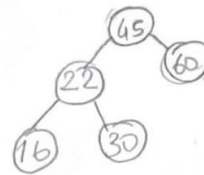Question 1
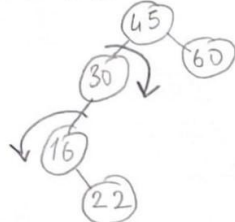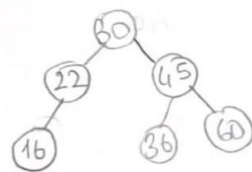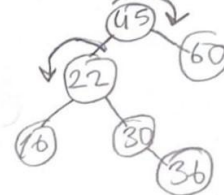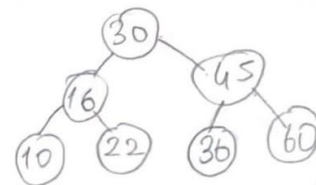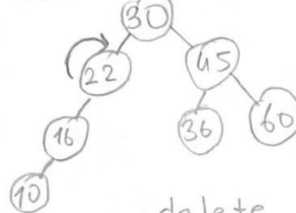
a)

b)

insert 30 :

(30)

insert 45 :

[30 45]

insert 60 :

(45)
(30) (60)

insert 16 :

(45)
[16 30]   (60)

insert 22 :

[22 45]
(16) (30) (60)

insert 36 :

[22 45]
(16) [30 36] (60)

insert 10 :

[22 45]
[10 16] [30 36] (60)

insert 25 :

(30)
(22)   (45)
[10 16] (25) (36) (60)

delete 10 :

(30)
(22)   (45)
(16) (25) (36) (60)

delete 45 :

[22 30]
(16) (25) [36 60]

delete 22 :

(30)
[16 25] [36 60]

c) insert 30:

(30)

insert 45:

[30 45]

insert 60:

(30 45 60)

Insert 16:

(35)
├ (16)
└ [45 60]

insert 22:

(30)
├ [16 22]
└ [45 60]

insert 36:

(30)
├ [16 22]
└ [36 45 60]

insert 10:

(30)
├ [10 16 22]
└ [36 45 60]

Insert 25:

[16 30]
├ (10)
├ [22 25]
└ [36 45 60]

delete 10:

[22 30]
├ (16)
├ (25)
└ [36 45 60]

delete 45:

[22 30]
├ (16)
├ (25)
└ [36 60]

delete 22

(30)
├ [16 25]
└ [36 60]
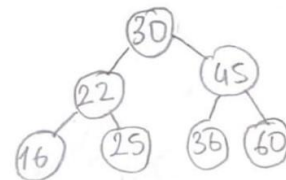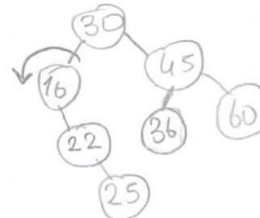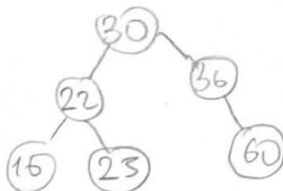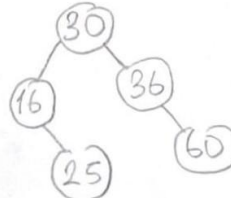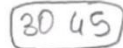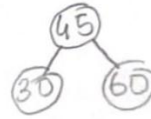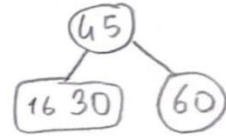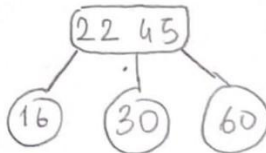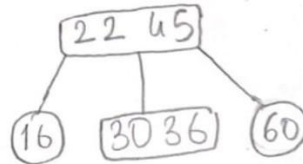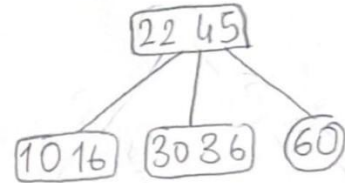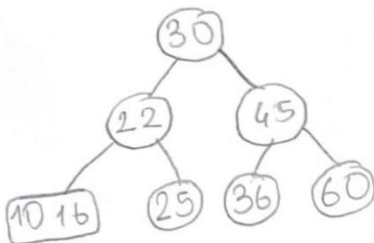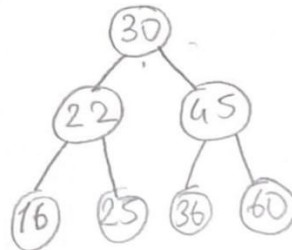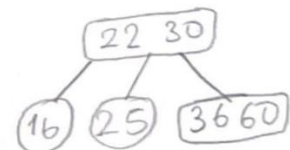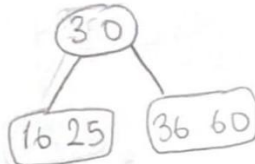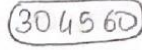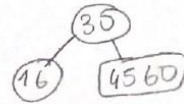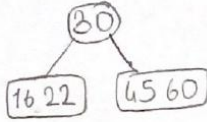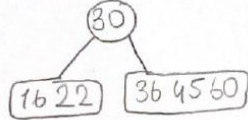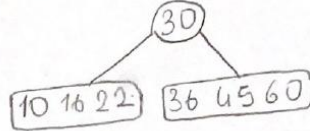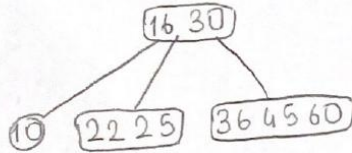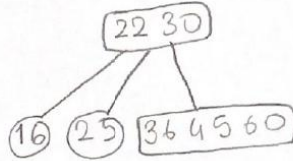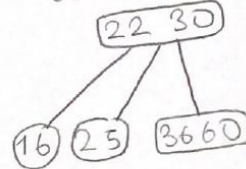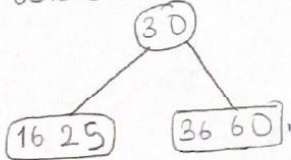
Question 2

a)

heap Insert ("G")

G

heap Insert ("J")

G
J

heap Insert ("J")

J
G

heap Insert ("D")

J
G   D

heap Insert ("T")

J
G   D
T

heap Insert ("T")

J
T   D
G

heap Insert ("T")

T
J   D
G

heap Insert ("U")

T
J   D
G   U

heap Insert ("U")

T
U   D
G   J

heap Insert ("U")

U
T   D
G   J

heap Insert ("C")

U
T   D
G J C

heap Insert ("B")

U
T   D
G J   C   B

heap Insert ("Q")

U
T   D
G J C   B
Q

heap Insert ("Q")

U
T   D
Q J C   B
G

heap Insert ("B")

U
T   D
Q J   C   B
G B

heap Insert ("X")

U
T   D
Q J C B
G B X

heap Insert ("X")

U
T   D
Q X C B
G B J

heap Insert ("X")

U
X   D
Q T C B
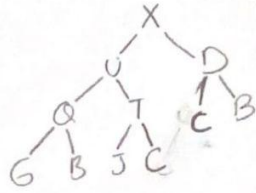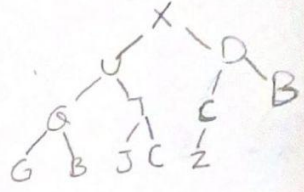G B J

(continued)
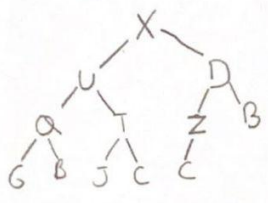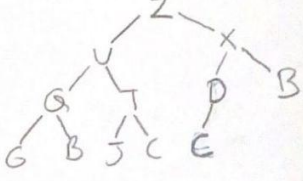heap Insert ("X")
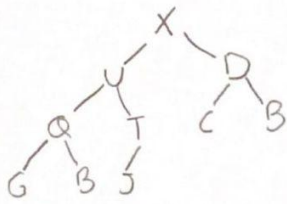
heap Insert ("C").

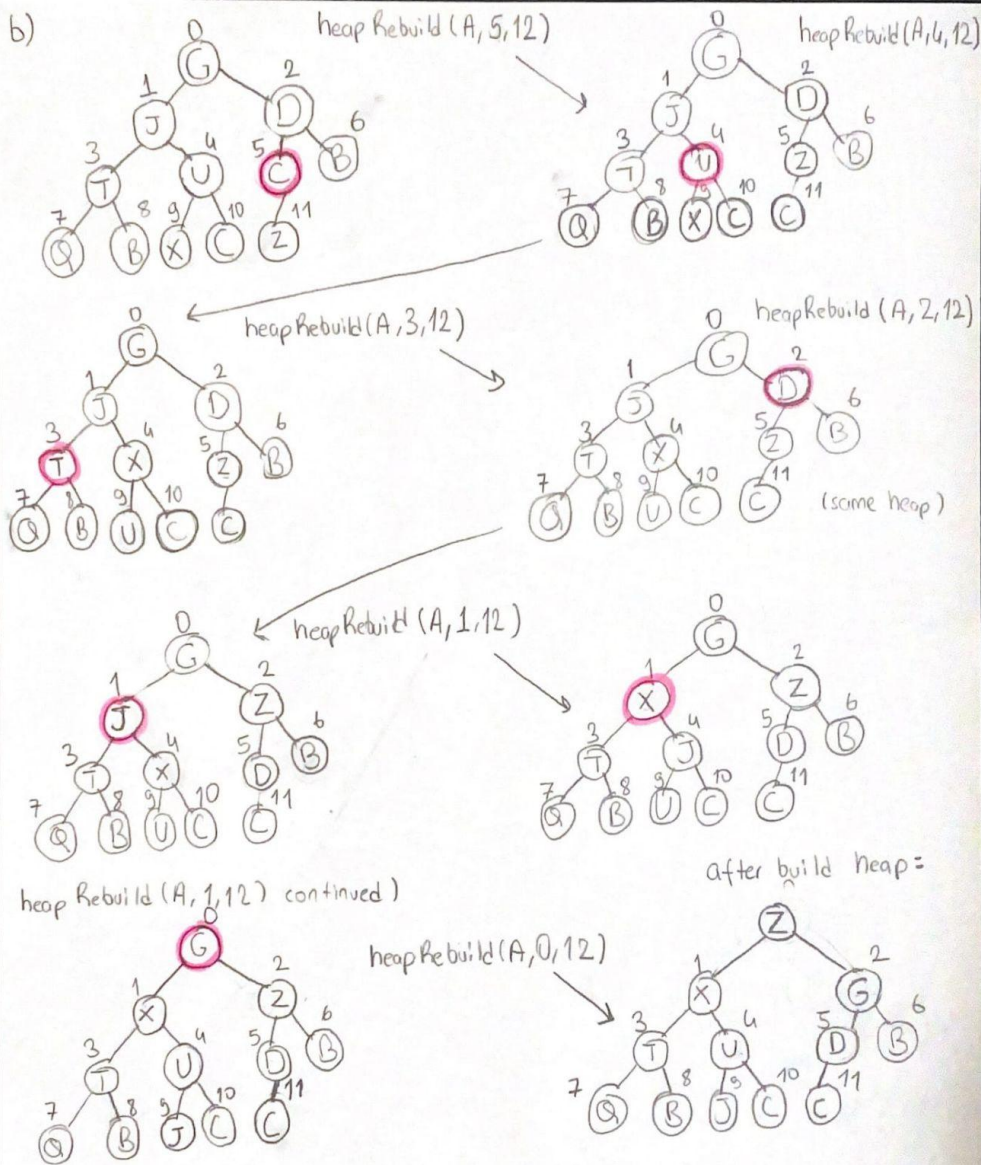heap Insert ("Z")

(continued)
heap Insert ("Z")

(continued)
heapInsert ("Z")

(continued)
heap Insert ("Z")

b)

heap Rebuild (A, 5, 12)

heap Rebuild (A, 4, 12)

heap Rebuild (A, 3, 12)

heap Rebuild (A, 2, 12)

(same heap)

heap Rebuild (A, 1, 12)

after build heap:

heap Rebuild (A, 1, 12) continued)

heap Rebuild (A, 0, 12)
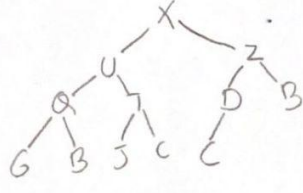
(A is the name of the array corresponding to heap)