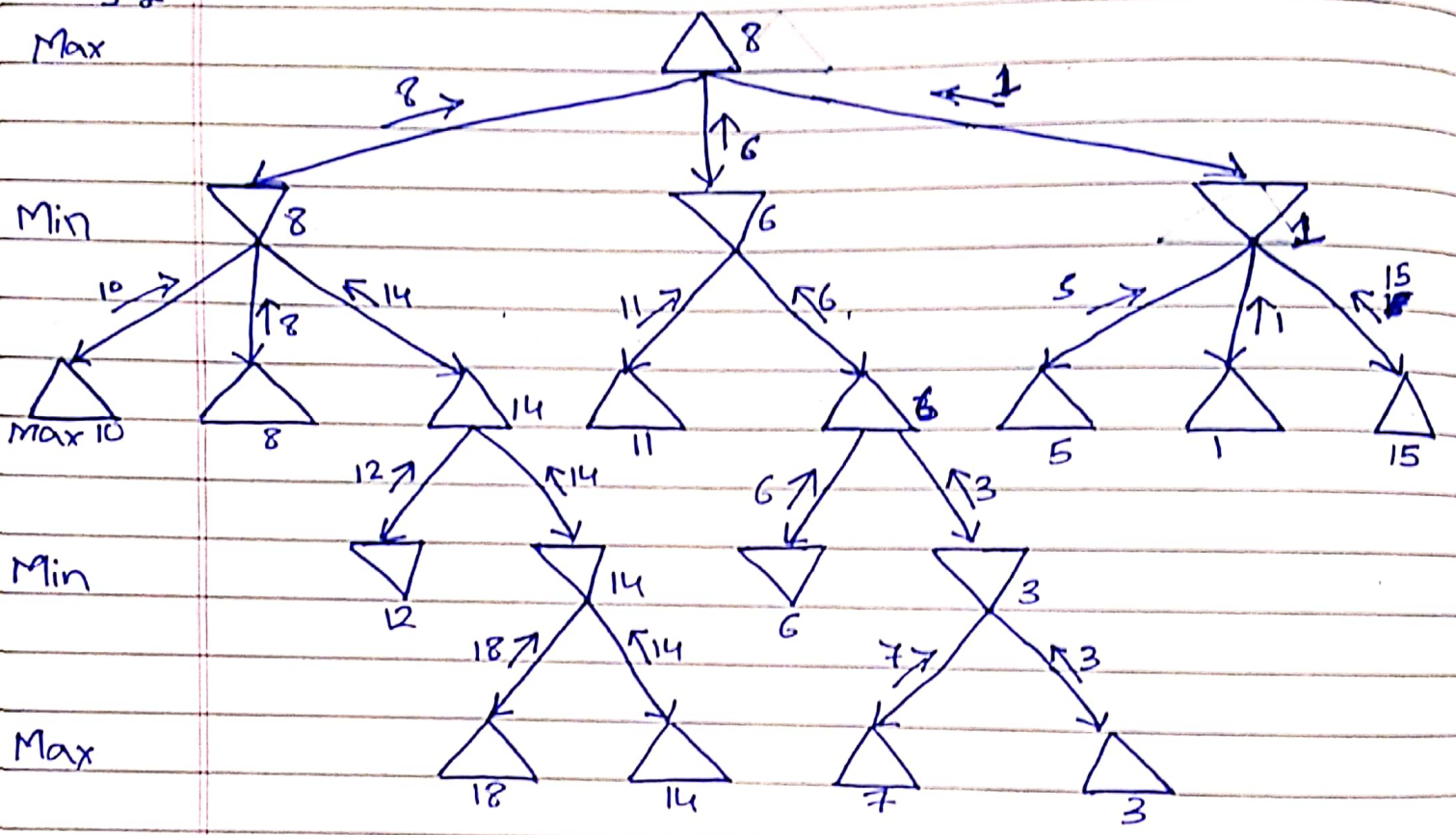
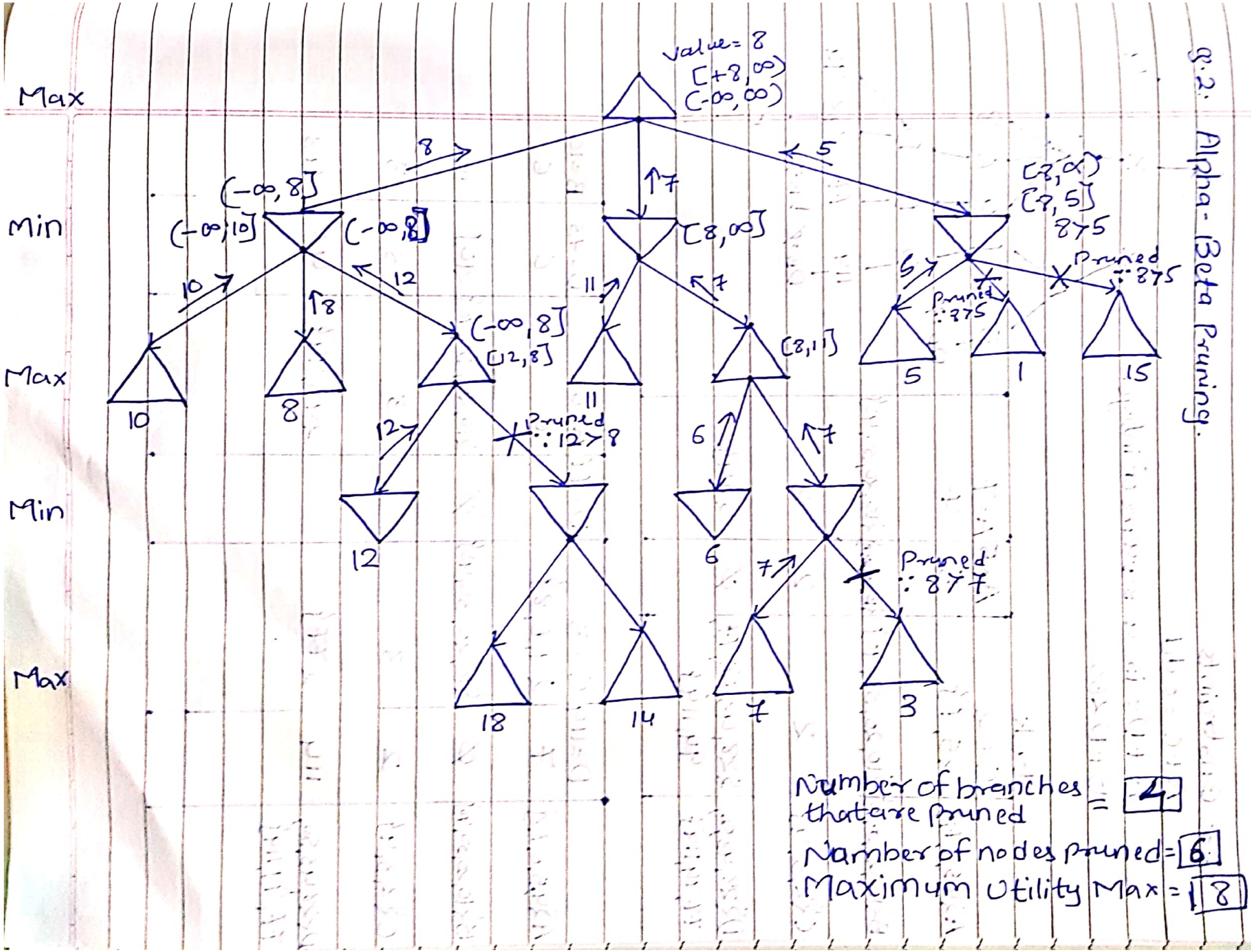
Assignment - 3.

Q.1.



→ The maximum Utility that MAX can achieve is **8**

Q:2: Alpha-Beta Pruning.

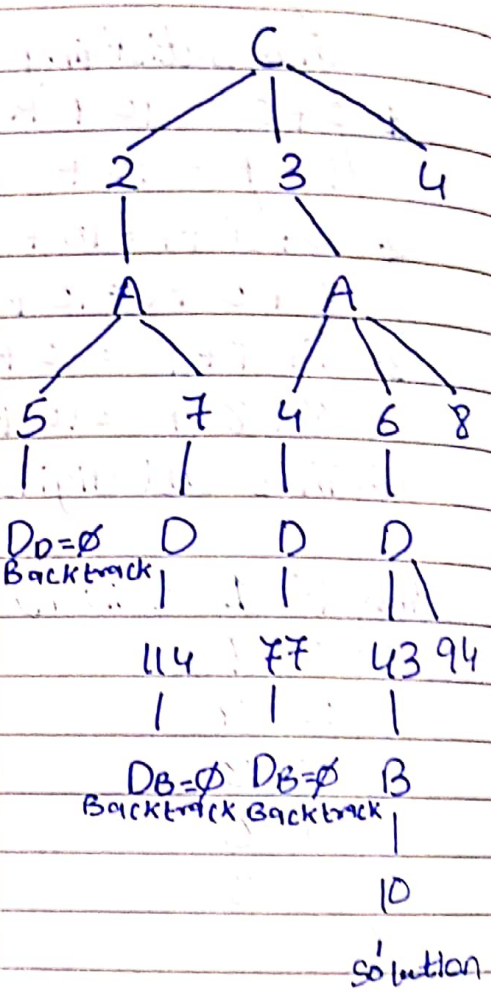


Q.3 Constraints

A+C = odd

A+D is a square of integer

B+D < 60



	Stack		
	C = 2	A = 5	A = 7
A {4,5,6,7,8}	{5,7}	5	7
B {10,20,30,40}	{10,20,30,40}	{10,20,30,40}	{10,20,30,40}
C {2,3,4}	2	2	2
D {28,43,56, 77,94,114}	{28,43,56,77 94,114}	∅	{114}

	D=114	C=3	A=4	D=77	A=6	D=43	B=10
A {4,5,6,7,8}	7	{4,6,8}	4	4	6	6	6
B {10,20,30,40}	∅	{10,20,30,40}	{10,20,30,40}	∅	{10,20,30,40}	{10}	10
C {2,3,4}	2	3	3	3	3	3	3
D {28,43,56, 77,94,114}	114	{28,43,56, 77,94,114}	{77}	77	{43,94}	43	43

Thus satisfying all the constraints

1. A + C = odd

→ 6 + 3 = 9

2. A + D is a square of an integer

→ 6 + 43 = 49 ... {$7^2 = 49$}

3. B + D < 60

→ 10 + 43 = 53 < 60

Ans. A = 6

B = 10

C = 3

D = 43

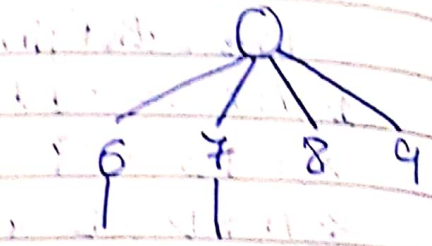
Q.4. Constraints

$O + O = 10 + R$

$W + W + 1 = 10 + U$

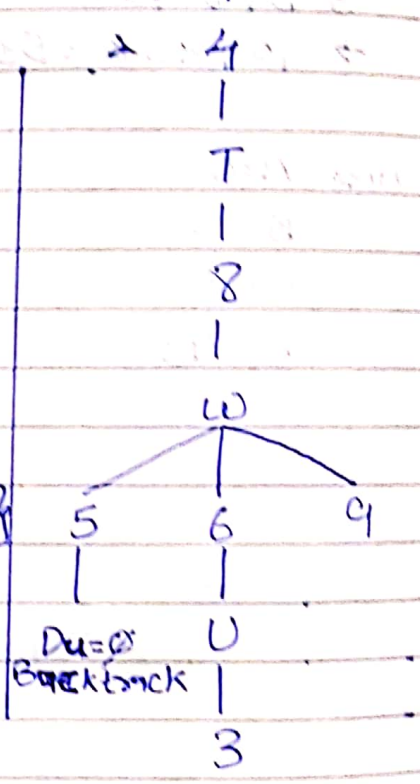
$T + T + 1 = 10 + O$

All digits are distinct.



Stack

	O = 6	O = 7	R = 4
O{6,7,8,9}	6	7	7
R{0,2...9}	{2}	{4}	4
W{5...9}	{5...9}	{5,6,8,9}	{5,6,8,9}
U{0,2...9}	{0,2...9}	{0,2,3,4,5,6,8,9}	{0,2,3,5,6,8,9}
T{5...9}	Ø	{8}	{8}



	T = 8	W = 5	W = 6	U = 3
O{6,7,8,9}	7	7	7	7
R{0,2...9}	4	4	4	4
W{5...9}	{5,6,9}	5	6	6
U{0,2...9}	{0,2,3,5,6,9}	Ø	{3}	3
T{5...9}	8	8	8	8

Thus satisfying all the constraints

1. $O+O = 10+R$

   $7+7 = 10+4 = 14$

2. $W+W+1 = 10+U$

   $6+6+1 = 10+3 = 13$

3. $T+T+1 = 10+O$

   $8+8+1 = 10+7 = 17$

4. Thus all digits are distinct.

Ans: $F = 1$ (Given)

$O = 7$

$R = 4$

$T = 8$

$W = 6$

$U = 3$

Thus,

$$\begin{array}{r} T\,W\,O \\ +\,T\,W\,O \\ \hline F\,O\,U\,R \end{array} \quad \begin{array}{r} 8\,6\,7 \\ +\,8\,6\,7 \\ \hline 1\,7\,3\,4 \end{array}$$