User manual and results

1. Run this program, solution to the problem will be shown as below:

MINIMAX:

maximum value : 6

path : [2, 1, 3]

ALPHA-BETA:

max cut after 7 in subtree (7 9 8)

min cut after 3 in subtree (3 6 4)

min cut after 2 in subtree (9 2 9)

max cut after 7 in subtree ((9 2 9) 4 7 (6 4 5))

maximum value : 6

2. Comment on this line:

```
case = "((4 (7 9 8) 8) (((3 6 4) 2 6) ((9 2 9) 4 7 (6 4 5))))"
```

Release the comment on this line:

```
# case = "(((1 4) (3 (5 2 8 0) 7 (5 7 1)) (8 3)) (((3 6 4) 2 (9
3 0)) ((8 1 9) 8 (3 4 ))))"
```

Run this program, solution to the problem will be shown as below:

MINIMAX:

maximum value : 4

path : [1, 1, 2]

ALPHA-BETA:

min cut after 2 in subtree (5 2 8 0)

max cut after 7 in subtree (3 (5 2 8 0) 7 (5 7 1))

max cut after 8 in subtree (8 3)

min cut after 3 in subtree (3 6 4)

min cut after 3 in subtree (9 3 0)

min cut after ((3 6 4) 2 (9 3 0)) in subtree (((3 6 4) 2 (9 3 0)) ((8 1 9) 8 (3 4)))

maximum value : 4

3. Comment on this line:

```
case = "(((1 4) (3 (5 2 8 0) 7 (5 7 1)) (8 3)) (((3 6 4) 2 (9 3
0)) ((8 1 9) 8 (3 4 ))))"
```

Release the comment on this line:

```
# case = "(5 (((4 7 -2) 7) 6))"
```

Run this program, solution to the problem will be shown as below:

MINIMAX:

maximum value : 6

path : [2, 2]

ALPHA-BETA:

min cut after 4 in subtree (4 7 -2)

maximum value : 6

4. Comment on this line:

```
case = "(5 (((4 7 -2) 7) 6))"
```

Release the comment on this line:

```
# case = "((8 (7 9 8) 4) (((3 6 4) 2 1) ((6 2 9) 4 7 (6 4
5))))"
```

Run this program, solution to the problem will be shown as below:

MINIMAX:

maximum value : 4

path : [1, 3]

ALPHA-BETA:

max cut after 9 in subtree (7 9 8)

min cut after 3 in subtree (3 6 4)

min cut after ((3 6 4) 2 1) in subtree (((3 6 4) 2 1) ((6 2 9) 4 7 (6 4 5)))

maximum value : 4

5. Comment on this line:

```
case = "((8 (7 9 8) 4) (((3 6 4) 2 1) ((6 2 9) 4 7 (6 4 5))))"
```

Release the comment on this line:

```
# case = "(((1(4 7)) (3 ((5 2) (2 8 9) 0 -2) 7 (5 7 1)) (8 3))
(((8 (9 3 2) 5) 2 (9 (3 2) 0)) ((3 1 9) 8 (3 4))))"
```

Run this program, solution to the problem will be shown as below:

MINIMAX:

maximum value : 5

path : [2, 1, 1, 3]

ALPHA-BETA:

max cut after 5 in subtree (5 2)

max cut after 8 in subtree (2 8 9)

min cut after 0 in subtree ((5 2) (2 8 9) 0 -2)

max cut after 7 in subtree (3 ((5 2) (2 8 9) 0 -2) 7 (5 7 1))

max cut after 8 in subtree (8 3)

max cut after 9 in subtree (9 3 2)

min cut after (3 2) in subtree (9 (3 2) 0)

min cut after 3 in subtree (3 1 9)

max cut after 8 in subtree ((3 1 9) 8 (3 4))

maximum value : 5