Team 7 - Red Velvet

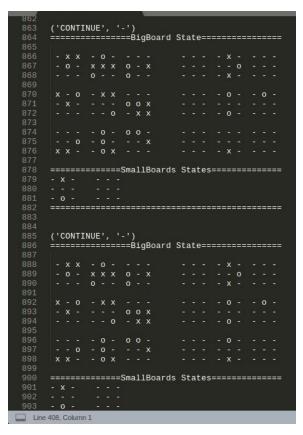- Preet(20171068), Neel(20171015)

1. Changes which can be made to our heuristic:
- Take into account the rule of bonus move.
- In case of draw, give preference to win the blocks on the periphery.
- Currently, our heuristic function evaluates till the timeout (24 secs) and returns the value of the node which it is analyzing. A better idea could be to employ iterative deepening(IDS) and return the best node from the last level explored.
- After including IDS, we could sort the nodes on each level according to their value after exploring all the nodes on that level. Now, we could explore the best nodes before than those with lesser value.

2. Moves where our bot could have performed better:
- Our bot chose to play in top right corner (1,6,3), which gave opponent to win top left small board on 1st big board. Instead, had our bot played on (1,6,5) or (1,8,5) the opponent would not have won a small board.

- Our bot chose to play in top right corner (1,6,4), which gave opponent to win two small boards consecutively. Instead, had our bot played on (1,6,5) or (1,8,5) the opponent would not have won a small board. This was due to the lack of consideration of bonus move

```
862
863    ('CONTINUE', '-')
864    ================BigBoard State================
865
866    - x x   - o -   - - -       - - -   - x -   - - -
867    - o -   x x x   o - x       - - -   - - o   - - -
868    - - -   o - -   o - -       - - -   - x -   - - -
869
870    x - o   - x x   - - -       - - -   - o -   - o -
871    - x -   - - -   o o x       - - -   - - -   - - -
872    - - -   - - o   - x x       - - -   - o -   - - -
873
874    - - -   - o -   o o -       - - -   - - -   - - -
875    - - o   - o -   - - x       - - -   - - -   - - -
876    x x -   - o x   - - -       - - -   - x -   - - -
877
878    ==============SmallBoards States==============
879    - x -     - - -
880    - - -     - - -
881    - o -     - - -
882    ==============================================
883
884
885    ('CONTINUE', '-')
886    ================BigBoard State================
887
888    - x x   - o -   - - -       - - -   - x -   - - -
889    - o -   x x x   o - x       - - -   - - o   - - -
890    - - -   o - -   o - -       - - -   - x -   - - -
891
892    x - o   - x x   - - -       - - -   - o -   - o -
893    - x -   - - -   o o x       - - -   - - -   - - -
894    - - -   - - o   - x x       - - -   - o -   - - -
895
896    - - -   - o -   o o -       - - -   - o -   - - -
897    - - o   - o -   - - x       - - -   - - -   - - -
898    x x -   - o x   - - -       - - -   - x -   - - -
899
900    ==============SmallBoards States==============
901    - x -     - - -
902    - - -     - - -
903    - o -     - - -
```

Line 408, Column 1

- Our bot chose to play in top right corner (1,4,5), which gave opponent to win top center small board on 1st big board. Instead, had our bot played on (1,5,5) the opponent would not have won a small board.

```
599  ('CONTINUE', '-')
600  ================BigBoard State================
601
602   - x x   - o -   - - -      - - -  - - -  - - -
603   - o -   x x -   o - x      - - -  - - -  - - -
604   - - -   o - -   o - -      - - -  - - -  - - -
605
606   x - o   - x x   - - -      - - -  - - -  - - -
607   - x -   - - -   o o -      - - -  - - -  - - -
608   - - -   - - o   - x -      - - -  - - -  - - -
609
610   - - -   - o -   o - -      - - -  - - -  - - -
611   - - o   - - -   - - x      - - -  - - -  - - -
612   x x -   - o x   - - -      - - -  - - -  - - -
613
614  =============SmallBoards States=============
615   - - -      - - -
616   - - -      - - -
617   - - -      - - -
618  ============================================
619
620
621  ('CONTINUE', '-')
622  ================BigBoard State================
623
624   - x x   - o -   - - -      - - -  - - -  - - -
625   - o -   x x -   o - x      - - -  - - -  - - -
626   - - -   o - -   o - -      - - -  - - -  - - -
627
628   x - o   - x x   - - -      - - -  - o -  - - -
629   - x -   - - -   o o -      - - -  - - -  - - -
630   - - -   - - o   - x -      - - -  - - -  - - -
631
632   - - -   - o -   o - -      - - -  - - -  - - -
633   - - o   - - -   - - x      - - -  - - -  - - -
634   x x -   - o x   - - -      - - -  - - -  - - -
635
636  =============SmallBoards States=============
637   - - -      - - -
638   - - -      - - -
639   - - -      - - -
640  --------------------------------------------
```

- Our bot chose to play in top right corner (0,5,5), which gave opponent to block our chances of winning bottom right small board on first big board. Instead, had our bot played on (0,4,4) opponent would not have got chance of blocking.

```
576
577    ('CONTINUE', '-')
578    ================BigBoard State================
579
580    x o -   - - -   - - -        - - -   - - -   - - -
581    - o -   - x -   - - x        - - -   - - -   - - -
582    - - -   o x -   - x o        - - -   - - -   - - -
583
584    - o -   - x o   - - -        - - -   - - -   - - -
585    - - -   - o -   o x o        - - -   - - -   - - -
586    x - -   x - -   - - -        - - -   - - -   - - -
587
588    - - x   - - -   x - -        - - o   - - -   - - -
589    - - -   - o x   x - -        - - -   - - -   - - -
590    - - -   - o -   - - -        - - o   - - -   - - -
591
592    ==============SmallBoards States==============
593    - - -      - - -
594    - - -      - - -
595    - - -      - - -
596    ==============================================
597
598
599    ('CONTINUE', '-')
600    ================BigBoard State================
601
602    x o -   - - -   - - -        - - -   - - -   - - -
603    - o -   - x -   - - x        - - -   - - -   - - -
604    - - -   o x -   - x o        - - -   - - -   - - -
605
606    - o -   - x o   - - -        - - -   - - -   - - -
607    - - -   - o -   o x o        - - -   - - -   - - -
608    x - -   x - x   - - -        - - -   - - -   - - -
609
610    - - x   - - -   x - -        - - o   - - -   - - -
611    - - -   - o x   x - -        - - -   - - -   - - -
612    - - -   - o -   - - -        - - o   - - -   - - -
613
614    ==============SmallBoards States==============
615    - - -      - - -
616    - - -      - - -
617    - - -      - - -
```

Line 617 Column 1