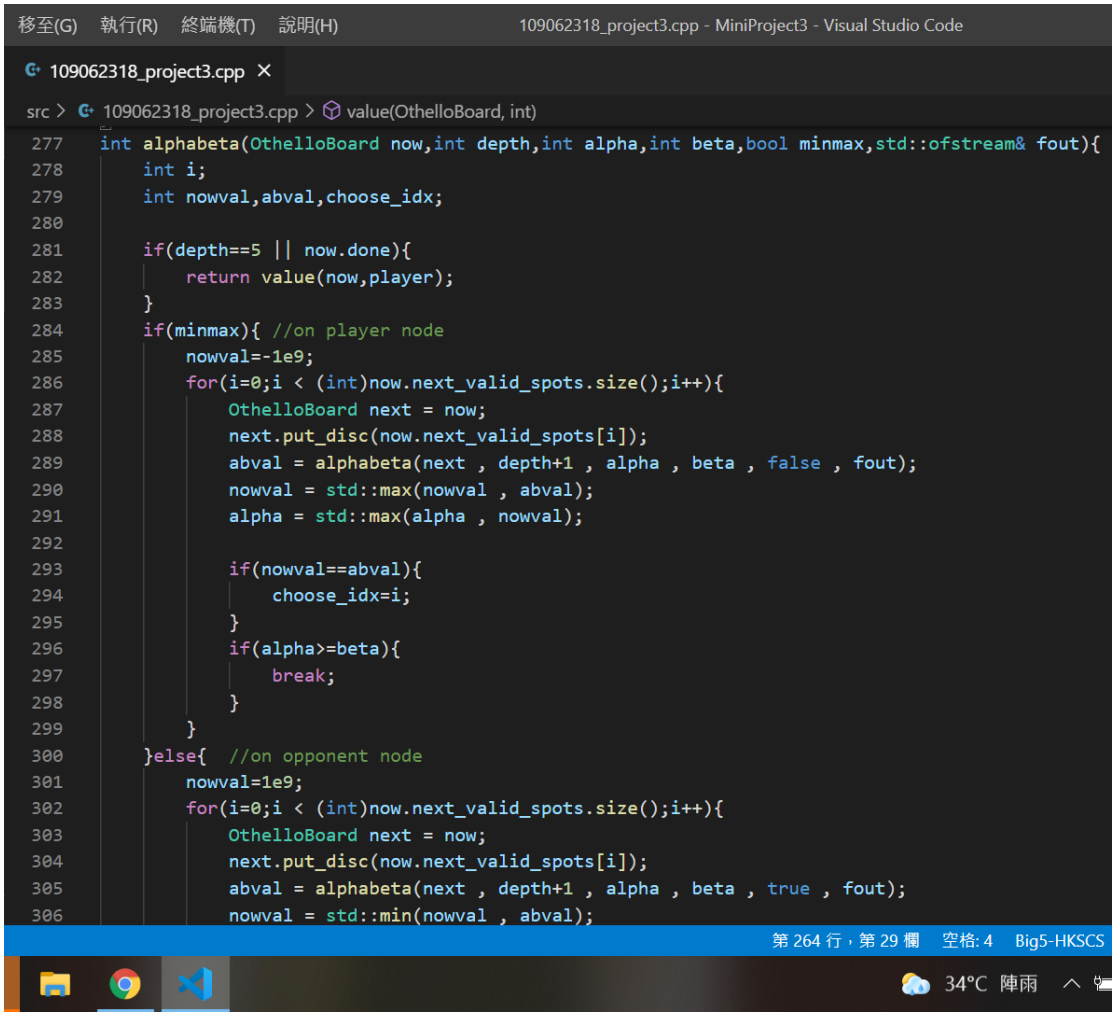
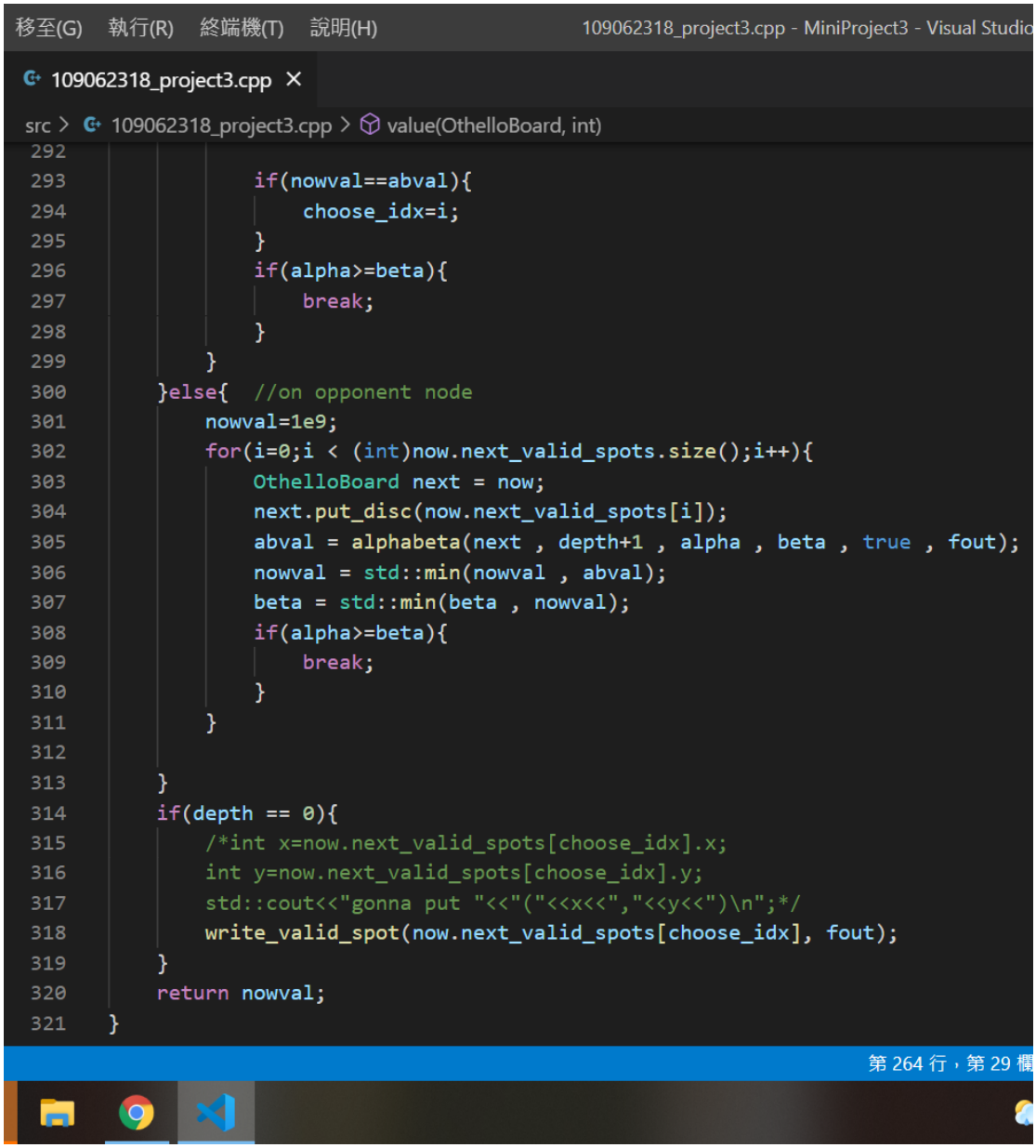
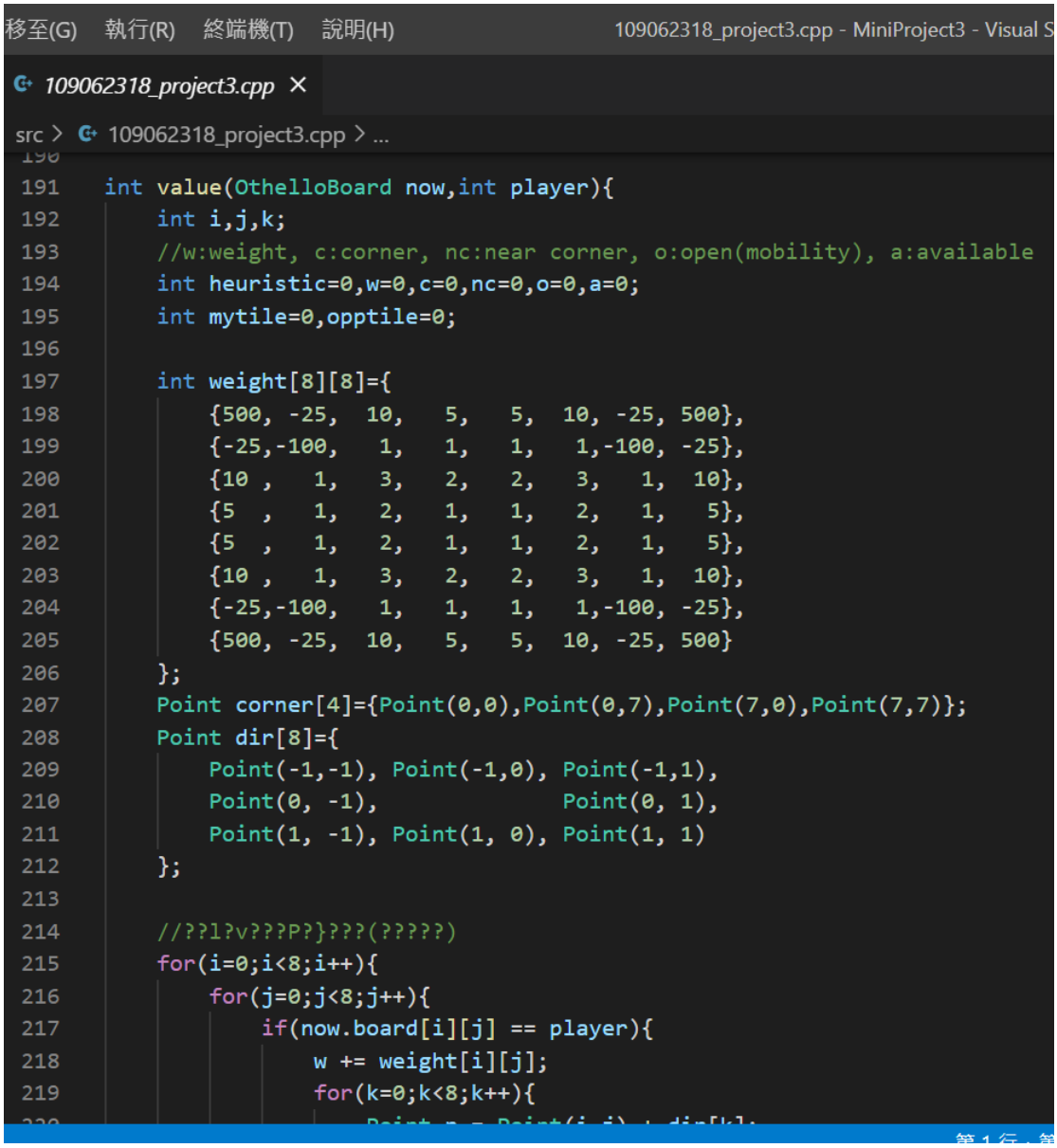
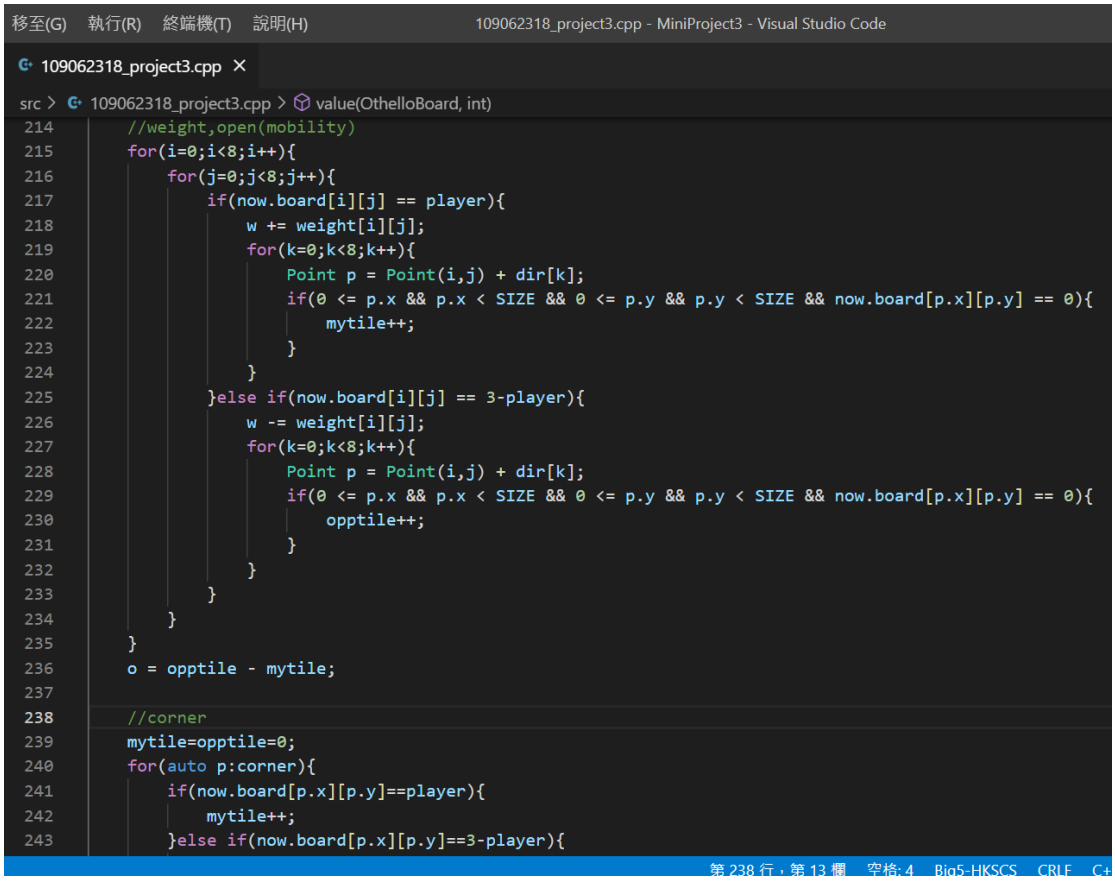
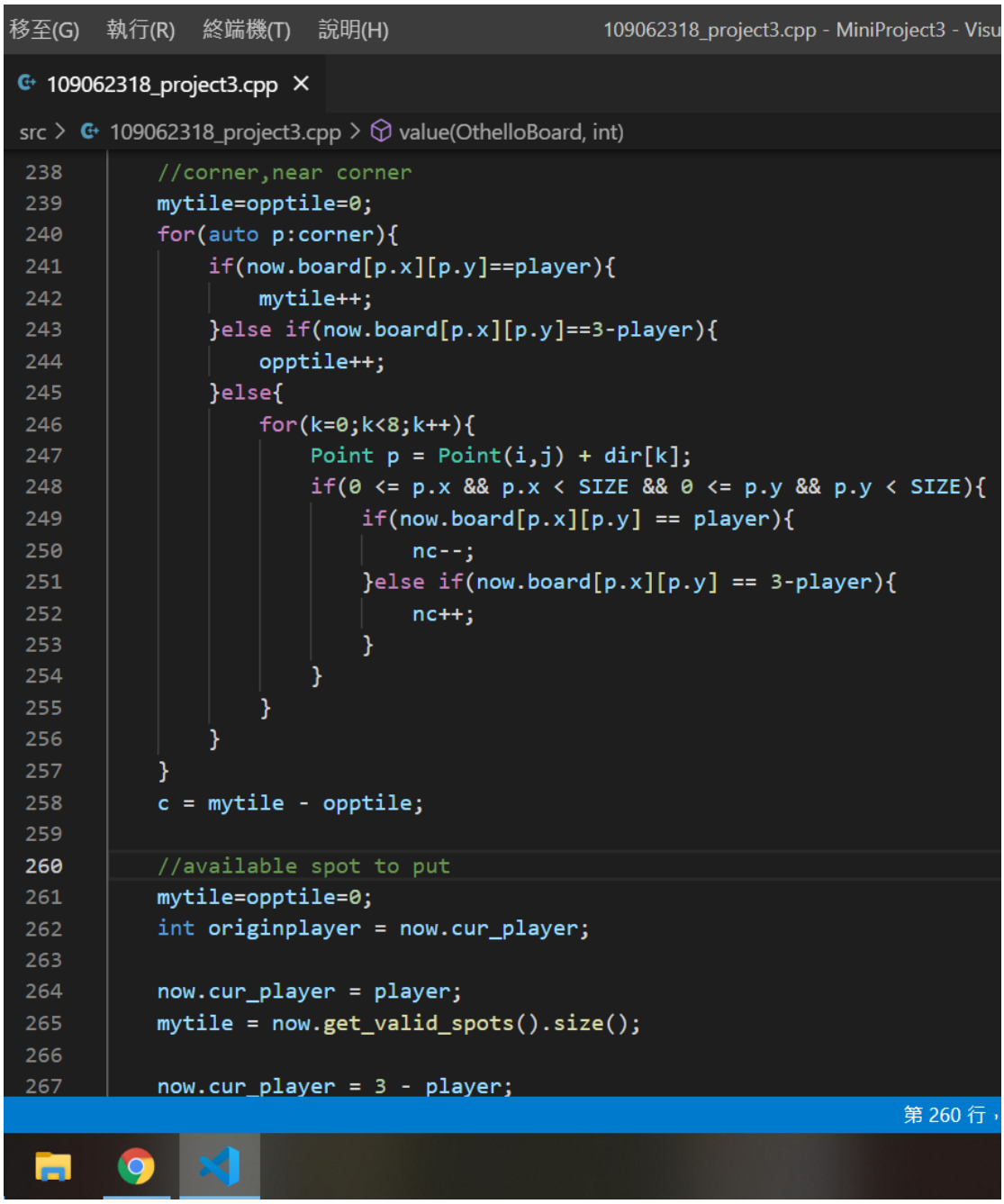
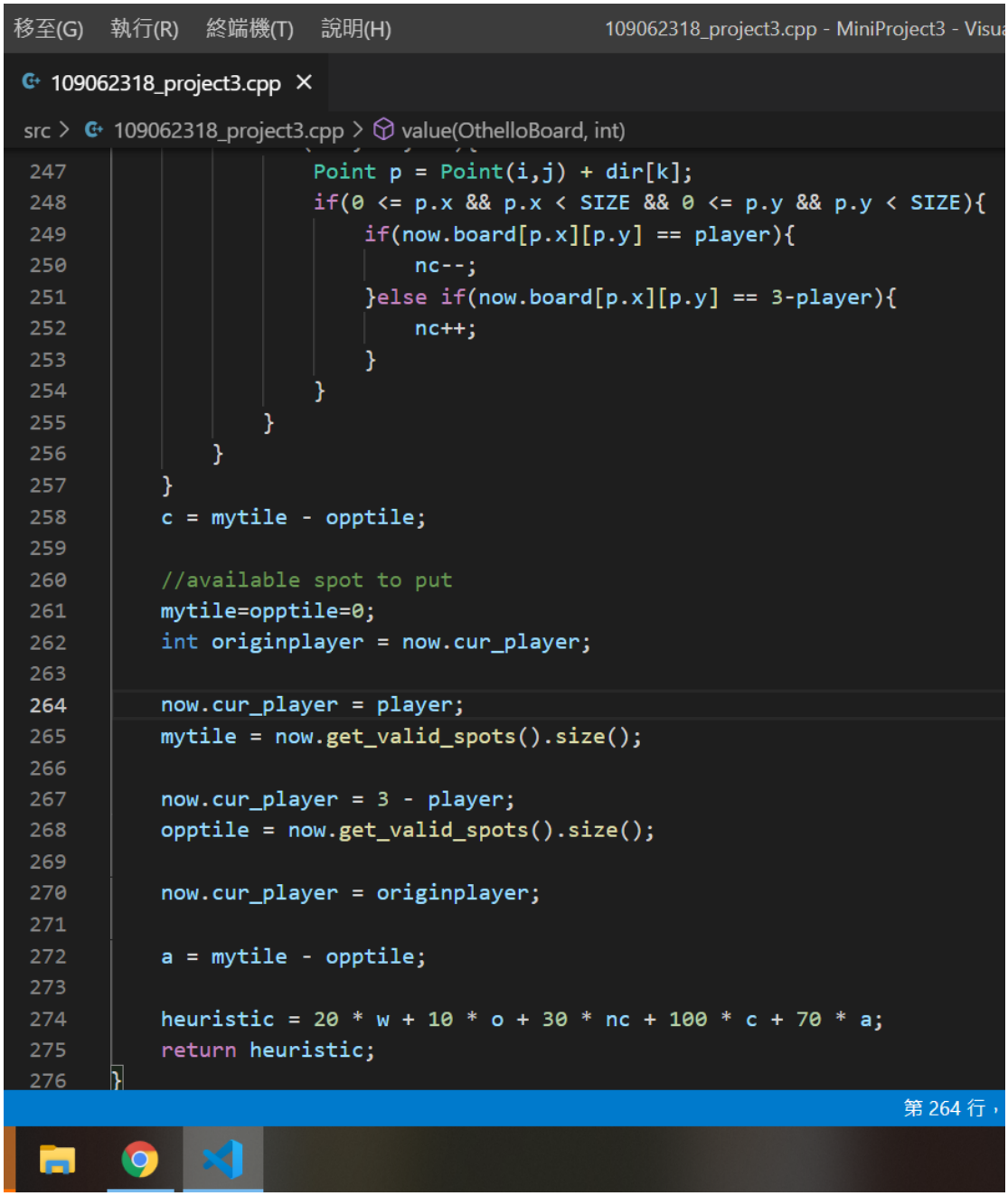

移至(G) 執行(R) 終端機(T) 說明(H) 109062318_project3.cpp - MiniProject3 - Visual Studio Code
109062318_project3.cpp
src > 109062318_project3.cpp > value(OthelloBoard, int)
277 int alphabeta(OthelloBoard now,int depth,int alpha,int beta,bool minmax,std::ofstream& fout){
278 int i;
279 int nowval,abval,choose_idx;
280
281 if(depth==5 || now.done){
282 return value(now,player);
283 }
284 if(minmax){ //on player node
285 nowval=-1e9;
286 for(i=0;i < (int)now.next_valid_spots.size();i++){
287 OthelloBoard next = now;
288 next.put_disc(now.next_valid_spots[i]);
289 abval = alphabeta(next , depth+1 , alpha , beta , false , fout);
290 nowval = std::max(nowval , abval);
291 alpha = std::max(alpha , nowval);
292
293 if(nowval==abval){
294 choose_idx=i;
295 }
296 if(alpha>=beta){
297 break;
298 }
299 }
300 }else{ //on opponent node
301 nowval=1e9;
302 for(i=0;i < (int)now.next_valid_spots.size();i++){
303 OthelloBoard next = now;
304 next.put_disc(now.next_valid_spots[i]);
305 abval = alphabeta(next , depth+1 , alpha , beta , true , fout);
306 nowval = std::min(nowval , abval);
第 264 行，第 29 欄 空格: 4 Big5-HKSCS
34°C 陣雨


移至(G) 執行(R) 終端機(T) 說明(H) 109062318_project3.cpp - MiniProject3 - Visual Studio
109062318_project3.cpp
src > 109062318_project3.cpp > value(OthelloBoard, int)
292
293 if(nowval==abval){
294 choose_idx=i;
295 }
296 if(alpha>=beta){
297 break;
298 }
299 }
300 }else{ //on opponent node
301 nowval=1e9;
302 for(i=0;i < (int)now.next_valid_spots.size();i++){
303 OthelloBoard next = now;
304 next.put_disc(now.next_valid_spots[i]);
305 abval = alphabeta(next , depth+1 , alpha , beta , true , fout);
306 nowval = std::min(nowval , abval);
307 beta = std::min(beta , nowval);
308 if(alpha>=beta){
309 break;
310 }
311 }
312
313 }
314 if(depth == 0){
315 /*int x=now.next_valid_spots[choose_idx].x;
316 int y=now.next_valid_spots[choose_idx].y;
317 std::cout<<"gonna put "<<"("<<x<<","<<y<<")\n";*/
318 write_valid_spot(now.next_valid_spots[choose_idx], fout);
319 }
320 return nowval;
321 }
第 264 行，第 29 欄


移至(G) 執行(R) 終端機(T) 說明(H) 109062318_project3.cpp - MiniProject3 - Visual S
109062318_project3.cpp
src > 109062318_project3.cpp > ...
int value(OthelloBoard now,int player){
int i,j,k;
//w:weight, c:corner, nc:near corner, o:open(mobility), a:available
int heuristic=0,w=0,c=0,nc=0,o=0,a=0;
int mytile=0,opptile=0;
int weight[8][8]={
{500, -25, 10, 5, 5, 10, -25, 500},
{-25,-100, 1, 1, 1, 1,-100, -25},
{10 , 1, 3, 2, 2, 3, 1, 10},
{5 , 1, 2, 1, 1, 2, 1, 5},
{5 , 1, 2, 1, 1, 2, 1, 5},
{10 , 1, 3, 2, 2, 3, 1, 10},
{-25,-100, 1, 1, 1, 1,-100, -25},
{500, -25, 10, 5, 5, 10, -25, 500}
};
Point corner[4]={Point(0,0),Point(0,7),Point(7,0),Point(7,7)};
Point dir[8]={
Point(-1,-1), Point(-1,0), Point(-1,1),
Point(0, -1), Point(0, 1),
Point(1, -1), Point(1, 0), Point(1, 1)
};
//??1?v???P?}???(?????)
for(i=0;i<8;i++){
for(j=0;j<8;j++){
if(now.board[i][j] == player){
w += weight[i][j];
for(k=0;k<8;k++){


移至(G) 執行(R) 終端機(T) 說明(H)
109062318_project3.cpp - MiniProject3 - Visual Studio Code
109062318_project3.cpp
src > 109062318_project3.cpp > value(OthelloBoard, int)
214 //weight,open(mobility)
215 for(i=0;i<8;i++){
216 for(j=0;j<8;j++){
217 if(now.board[i][j] == player){
218 w += weight[i][j];
219 for(k=0;k<8;k++){
220 Point p = Point(i,j) + dir[k];
221 if(0 <= p.x && p.x < SIZE && 0 <= p.y && p.y < SIZE && now.board[p.x][p.y] == 0){
222 mytile++;
223 }
224 }
225 }else if(now.board[i][j] == 3-player){
226 w -= weight[i][j];
227 for(k=0;k<8;k++){
228 Point p = Point(i,j) + dir[k];
229 if(0 <= p.x && p.x < SIZE && 0 <= p.y && p.y < SIZE && now.board[p.x][p.y] == 0){
230 opptile++;
231 }
232 }
233 }
234 }
235 }
236 o = opptile - mytile;
237
238 //corner
239 mytile=opptile=0;
240 for(auto p:corner){
241 if(now.board[p.x][p.y]==player){
242 mytile++;
243 }else if(now.board[p.x][p.y]==3-player){
第 238 行，第 13 欄 空格: 4 Big5-HKSCS CRLF C+


移至(G) 執行(R) 終端機(T) 說明(H) 109062318_project3.cpp - MiniProject3 - Visu
109062318_project3.cpp
src > 109062318_project3.cpp > value(OthelloBoard, int)
238 //corner,near corner
239 mytile=opptile=0;
240 for(auto p:corner){
241 if(now.board[p.x][p.y]==player){
242 mytile++;
243 }else if(now.board[p.x][p.y]==3-player){
244 opptile++;
245 }else{
246 for(k=0;k<8;k++){
247 Point p = Point(i,j) + dir[k];
248 if(0 <= p.x && p.x < SIZE && 0 <= p.y && p.y < SIZE){
249 if(now.board[p.x][p.y] == player){
250 nc--;
251 }else if(now.board[p.x][p.y] == 3-player){
252 nc++;
253 }
254 }
255 }
256 }
257 }
258 c = mytile - opptile;
259
260 //available spot to put
261 mytile=opptile=0;
262 int originplayer = now.cur_player;
263
264 now.cur_player = player;
265 mytile = now.get_valid_spots().size();
266
267 now.cur_player = 3 - player;
第 260 行，



Alphabeta:

深度為 5 或沒地方下的時候就計算該 board 的 heuristic value。

如果 nowval==abval，就代表最大值有被更新，要記錄目前的 point，到最後回到 root 的時候就把點輸出

==========

Statevalue:

1. 已放子跟可放子的地方的權重
2. 角落跟角落旁邊
3. 自己與敵人能落子的數量差