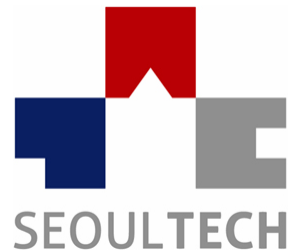


Programming

Project 2



Electronic and IT Media Engineering

Gyemin Lee

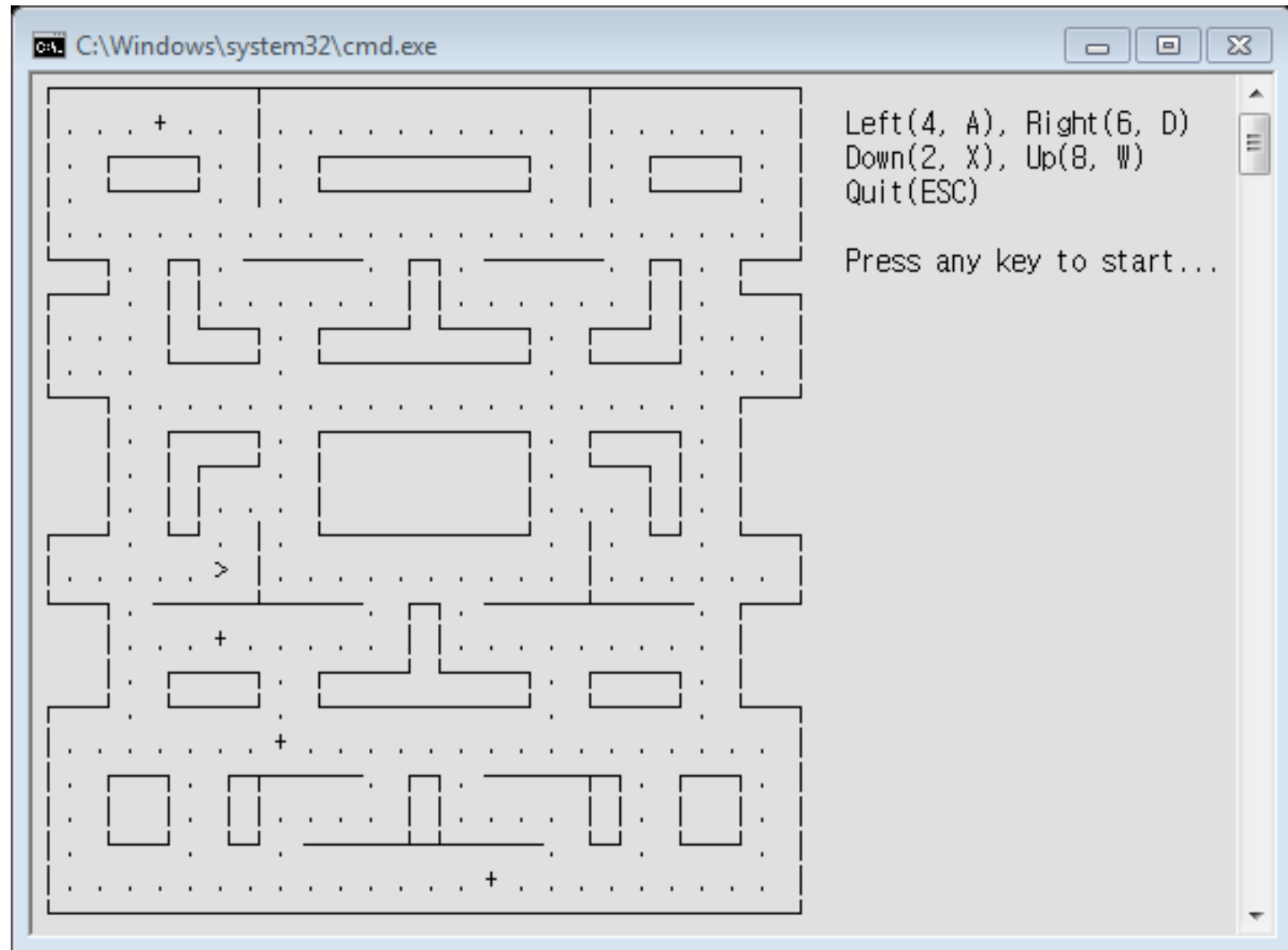
Project 2 – pacman game

- 배가 고프다.

pacman (>)

food (.)

pill (+)



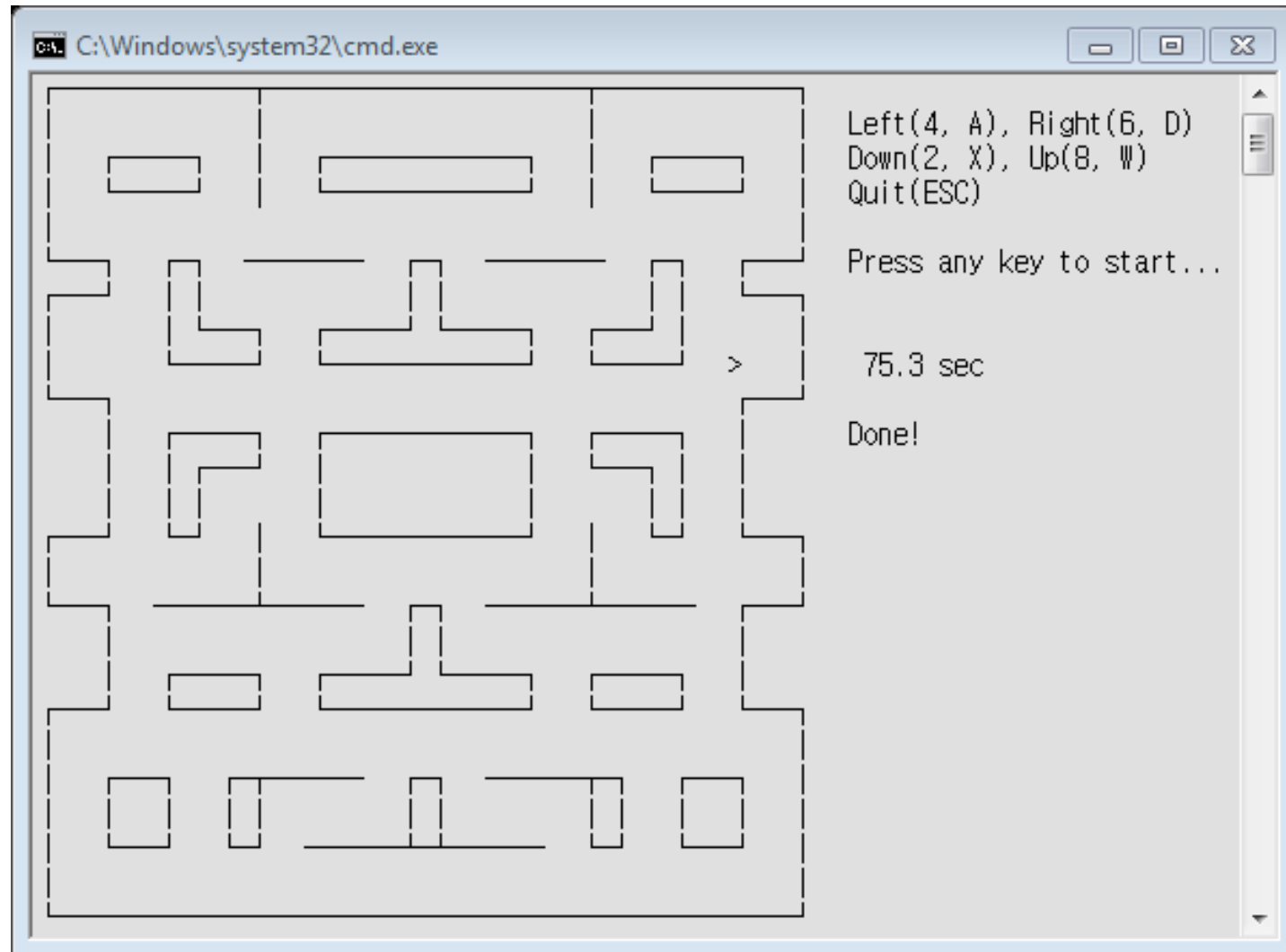
Project 2 – pacman game

- 배가 부른다.

pacman (>)

food (.)

pill (+)



Project 2 – pacman game

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <conio.h>
4 #include <time.h>
5 #include <Windows.h>
6
7 #define KEY_ESC    0x1B
8 #define KEY_8      '8'
9 #define KEY_2      '2'
10 #define KEY_4      '4'
11 #define KEY_6      '6'
12 #define KEY_W      'w'
13 #define KEY_X      'x'
14 #define KEY_A      'a'
15 #define KEY_D      'd'
16 // direction 방향
17 #define UP         1
18 #define DOWN       2
19 #define LEFT       3
20 #define RIGHT      4
21 // maze 미로 크기
22 #define MAZE_H     25
23 #define MAZE_W     26
24 // tile type 타일 종류
25 #define WALL       32
26 #define FOOD       1
27 #define PILL       2
28 #define NUM_PILL   4
```

```
31 // position
32 typedef struct _POS{
33     int row;
34     int col;
35 } POS;
36
37
38 // state of pacman
39 POS pacman;
40 int direction = RIGHT;
41 int speed = 100;
42
43 void init();           // initialize
44 void turn(int key);    // turn
45 void move();           // move pacman
46 int check();           // check
47 POS rand_pos();        // random position
48
49 void draw_maze();      // draw maze
50 void draw_pacman();    // draw pacman
51 void clear_pacman();   // clear pacman
52 void show_instruction(); // instruction
53
54 void goto_pos(POS pos);
55 void gotoxy(int x, int y); // move cursor
56 void showCursor(BOOL bVisible);
```

Project 2 – pacman game

```
59 // wall      32,  33,  34,  35,  36,  37,  38,  39,  40,  41,  42,  43
60 char* tile[] = {" ", "┌", "┐", "└", "┘", "├", "┤", "┼", "┴", "┬", "┴", "┬", "┴";
61
62
63 int maze[MAZE_H][MAZE_W] =
64 {
65     {33,38,38,38,38,38,38,41,38,38,38,38,38,38,38,38,41,38,38,38,38,38,34},
66     {37, 1, 1, 1, 1, 1, 1,37, 1, 1, 1, 1, 1, 1, 1, 1,37, 1, 1, 1, 1, 1,37},
67     {37, 1,33,38,38,34, 1,37, 1,33,38,38,38,38,38,38,34, 1,37, 1,33,38,38,34, 1,37},
68     {37, 1,35,38,38,36, 1,37, 1,35,38,38,38,38,38,38,36, 1,37, 1,35,38,38,36, 1,37},
69     {37, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,37},
70     {35,38,34, 1,33,34, 1,38,38,38,38, 1,33,34, 1,38,38,38,38, 1,33,34, 1,33,38,36},
71     {33,38,36, 1,37,37, 1, 1, 1, 1, 1,37,37, 1, 1, 1, 1, 1,37,37, 1,35,38,34},
72     {37, 1, 1, 1,37,35,38,34, 1,33,38,38,36,35,38,38,34, 1,33,38,36,37, 1, 1, 1,37},
73     {37, 1, 1, 1,35,38,38,36, 1,35,38,38,38,38,38,38,36, 1,35,38,38,36, 1, 1, 1,37},
74     {35,38,34, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,33,38,36},
75     {32,32,37, 1,33,38,38,34, 1,33,38,38,38,38,38,38,34, 1,33,38,38,34, 1,37,32,32},
76     {32,32,37, 1,37,33,38,36, 1,37, 7, 3,15, 3, 3, 3,37, 1,35,38,34,37, 1,37,32,32},
77     {32,32,37, 1,37,37, 1, 1, 1,37, 3,11, 3,19, 3, 3,37, 1, 1, 1,37,37, 1,37,32,32},
78     {33,38,36, 1,35,36, 1,37, 1,35,38,38,38,38,38,38,36, 1,37, 1,35,36, 1,35,38,34},
79     {37, 1, 1, 1, 1, 1, 1,37, 1, 1, 1, 1, 1, 1, 1, 1, 1,37, 1, 1, 1, 1, 1,37},
80     {35,38,34, 1,38,38,38,42,38,38,38, 1,33,34, 1,38,38,38,42,38,38,38, 1,33,38,36},
81     {32,32,37, 1, 1, 1, 1, 1, 1, 1, 1, 1,37,37, 1, 1, 1, 1, 1, 1, 1, 1,37,32,32},
82     {32,32,37, 1,33,38,38,34, 1,33,38,38,36,35,38,38,34, 1,33,38,38,34, 1,37,32,32},
83     {33,38,36, 1,35,38,38,36, 1,35,38,38,38,38,38,38,36, 1,35,38,38,36, 1,35,38,34},
84     {37, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,37},
85     {37, 1,33,38,34, 1,33,41,38,38,38, 1,33,34, 1,38,38,38,41,34, 1,33,38,34, 1,37},
86     {37, 1,37,32,37, 1,37,37, 1, 1, 1, 1,37,37, 1, 1, 1, 1,37,37, 1,37,32,37, 1,37},
87     {37, 1,35,38,36, 1,35,36, 1,38,38,38,42,42,38,38,38, 1,35,36, 1,35,38,36, 1,37},
88     {37, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,37},
89     {35,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,38,36},
90 };
```

Project 2 – pacman game

```
93 int main(void)
94 {
95     int ch;
96     clock_t tic;
97
98     // initialize the game
99     init();
100
101     // instruction
102     show_instruction();
103     turn(_getch());
104
105     // timer start
106     tic = clock();
107
108     // play
109     while (ch = check())
110     {
111         if (_kbhit())
112             turn(_getch());
113
114         clear_pacman();
115         move();
116         draw_pacman();
117
118         // timer
119         gotoxy(54, 8);
120         printf("%7.1f sec", (clock()-tic)/1000.0);
121
122         Sleep(speed);
123     }
```

```
125     // exit
126     gotoxy(54, 10);
127     puts("Done!");
128
129     gotoxy(0, MAZE_H);
130     return 0;
131 }
```

Project 2 – pacman game

```
134 // initialize
135 void init()
136 {
137     POS pos;
138     int i;
139
140     // random seed
141     srand((int)time(NULL));
142
143     // items
144     /* TODO
145      알약(PILL)을 NUM_PILL만큼 생성해서
146      음식(FOOD)대신에 위치시킨다.
147
148     */
149
150     // place packman
151     /* TODO
152      팩맨(packman)을 임의의 장소에 위치시킨다.
153      주의!
154      팩맨은 자신의 위치의 음식을 자동 섭취하므로
155      팩맨 위치(packman)의 maze값은 0으로 변경
156
157     */
158
```

```
159 // clear screen
160 system("cls");
161
162 // init window
163 showCursor(FALSE);
164
165 // draw
166 draw_maze();
167 draw_pacman();
168 }
```

Project 2 – pacman game

```
171 // turn the direction of pacman
172 void turn(int key)
173 {
174     switch(key)
175     {
176     case KEY_4: // left
177     case KEY_A:
178         // TODO
179
180         break;
181     case KEY_6: // right
182     case KEY_D:
183         // TODO
184
185         break;
186     case KEY_2: // down
187     case KEY_X:
188         // TODO
189
190         break;
191     case KEY_8: // up
192     case KEY_W:
193         // TODO
194
195         break;
```

```
196     case KEY_ESC: // quit
197         gotoxy(54, 10);
198         puts("Exit!\n");
199
200         gotoxy(0, MAZE_H);
201         exit(0);
202         break;
203     }
204 }
```


Project 2 – pacman game

```
207 // move pacman in the current direction
208 void move( )
209 {
210     /* TODO
211     현재 진행 방향(direction)에 따라
212     팩맨을 이동시켜 위치(pacman)를 갱신
213
214     현재 위치에 있는 음식은 자동으로 섭취하므로
215     팩맨 위치(packman)의 maze값은 0으로 변경
216
217     진행방향에 벽이 있으면 제 자리에
218
219
220     */
221 }
```

```
224 // check
225 int check( )
226 {
227     /* TODO
228     미로(maze) 안에 남아있는
229     먹이(FOOD)나 알약(PILL)의 개수를 return
230     전부 먹었으면 0을 return
231
232
233     */
234 }
```

Project 2 – pacman game

```
237 // random position
238 POS rand_pos()
239 {
240     /* TODO
241         maze 안의 위치를 랜덤으로 선택한다.
242         주의!
243         FOOD가 있는 위치에서만 선택
244
245     */
246
247 }
```

```
259 // draw pacman
260 void draw_pacman()
261 {
262     // move cursor
263     goto_pos(pacman);
264
265     /* TODO
266         packman을 그린다.
267         방향(direction)에 따라 v ^ > < 모양으로
268
269     */
270 }
```

```
250 // clear pacman
251 void clear_pacman()
252 {
253     // move cursor
254     goto_pos(pacman);
255     printf(" ");
256 }
```

Project 2 – pacman game

```
273 // draw maze
274 void draw_maze( )
275 {
276     /*  TODO
277         미로(maze)를 그린다.
278         FOOD  ".", "
279         PILL  "+ "
280         WALL  tile 이용
281
282
283     */
284 }
```

```
287 // show instruction
288 void show_instruction( )
289 {
290     gotoxy(54,1);    puts("Left(4, A), Right(6, D)");
291     gotoxy(54,2);    puts("Down(2, X), Up(8, W)");
292     gotoxy(54,3);    puts("Quit(ESC)");
293     gotoxy(54,5);    puts("Press any key to start...");
294 }
```

Project 2 – pacman game

```
297 // move cursor to pos
298 void goto_pos(POS pos)
299 {
300     gotoxy(pos.col*2, pos.row);
301 }
302
303
304 // move cursor to (x,y)
305 // upper left corner is (0,0)
306 void gotoxy(int x, int y)
307 {
308     COORD Pos = {x, y};
309     SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE), Pos);
310 }
311
312
313 // show cursor
314 void showCursor(BOOL bVisible)
315 {
316     CONSOLE_CURSOR_INFO CurInfo;
317     CurInfo.dwSize = 100;
318     CurInfo.bVisible = bVisible;
319     SetConsoleCursorInfo(GetStdHandle(STD_OUTPUT_HANDLE), &CurInfo);
320 }
```

- Due
 - Thursday, 6/9/2016 (3주간)
- 결과물
 - 소스파일 (학번_이름_pacman.c) e.g. 97000000_이계민_pacman.c
 - 레포트 (.pdf, 1 page) 97000000_이계민_report.pdf
 - 1 Megabytes 이내로
- Submission
 - e-Class 제출 – 소스파일(.c), 레포트(.pdf)
 - Hardcopy제출 – 소스파일(.c) , 레포트(.pdf)
- 주의
 - Code template(.c) and an executable(.exe) are available on the course website.
 - 주석 추가
 - You are allowed to consult with other students, but you may not share the source code. All project results are to be produced on your own.

- **Extras**

- 추가 기능 구현시 **창의성과 구현의 난이도**에 따라 추가 점수
- 제출물
 - 기본 기능의 결과물
 - 소스파일(학번_이름_pacman.c), 레포트(학번_이름_report.pdf)
 - 추가 기능의 결과물
 - 소스파일(학번_이름_pacman_extra.c), 레포트에 extra section 추가(.pdf)