# CMPE 150 PROJECT #1 CHESS MASTER

October 21, 2003

## 1 Definition

In this project you are going to find out the possible movements of chess pieces. Assume that, the chess board contains only one chess piece. There are six types of chess pieces.

Rook Displayed with R character in the project. Can move horizontally or vertically across the board. The table given below shows a rook which is initially in d4 and which squares it can go. Rook can always move to 14 different squares on the board.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | . | . | . | R | . | . | . | . |
| 7 | . | . | . | R | . | . | . | . |
| 6 | . | . | . | R | . | . | . | . |
| 5 | . | . | . | R | . | . | . | . |
| 4 | R | R | R | **R** | R | R | R | R |
| 3 | . | . | . | R | . | . | . | . |
| 2 | . | . | . | R | . | . | . | . |
| 1 | . | . | . | R | . | . | . | . |
| | a | b | c | d | e | f | g | h |

Knight Displayed with N character in the project. Displays an L figure when it moves. The table given below shows a knight which is initially in c5

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | . | . | . | . | . | . | . | . |
| 7 | . | N | . | N | . | . | . | . |
| 6 | N | . | . | . | N | . | . | . |
| 5 | . | . | **N** | . | . | . | . | . |
| 4 | N | . | . | . | N | . | . | . |
| 3 | . | N | . | N | . | . | . | . |
| 2 | . | . | . | . | . | . | . | . |
| 1 | . | . | . | . | . | . | . | . |
| | a | b | c | d | e | f | g | h |

and which squares it can go. Knight moves at least to 2 and at most to 8 different squares on the board.

Bishop Displayed with B character in the project. Can move diagonally across the board. The table given below shows a bishop which is initially in e4 and which squares it can go. Bishop can move at least to 7 and at most to 13 different squares on the board.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | B | . | . | . | . | . | . | . |
| 7 | . | B | . | . | . | . | . | B |
| 6 | . | . | B | . | . | . | B | . |
| 5 | . | . | . | B | . | B | . | . |
| 4 | . | . | . | . | **B** | . | . | . |
| 3 | . | . | . | B | . | B | . | . |
| 2 | . | . | B | . | . | . | B | . |
| 1 | . | B | . | . | . | . | . | B |
| | a | b | c | d | e | f | g | h |

Queen Displayed with Q character in the project. Can move diagonally, horizontally or vertically across the board. The table given below shows a queen which is initially in b3 and which squares it can go. Queen can move at least to 21 and at most to 27 different squares on the board.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | . | Q | . | . | . | . | Q | . |
| 7 | . | Q | . | . | . | Q | . | . |
| 6 | . | Q | . | . | Q | . | . | . |
| 5 | . | Q | . | Q | . | . | . | . |
| 4 | Q | Q | Q | . | . | . | . | . |
| 3 | Q | **Q** | Q | Q | Q | Q | Q | Q |
| 2 | Q | Q | Q | . | . | . | . | . |
| 1 | . | Q | . | Q | . | . | . | . |
| | a | b | c | d | e | f | g | h |

King Displayed with K character in the project. Can move diagonally, horizontally or vertically one square. The table given below shows a king which is initially in f6 and which squares it can go. King can move at least to 3 and at most to 8 different squares on the board.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | . | . | . | . | . | . | . | . |
| 7 | . | . | . | . | K | K | K | . |
| 6 | . | . | . | . | K | **K** | K | . |
| 5 | . | . | . | . | K | K | K | . |
| 4 | . | . | . | . | . | . | . | . |
| 3 | . | . | . | . | . | . | . | . |
| 2 | . | . | . | . | . | . | . | . |
| 1 | . | . | . | . | . | . | . | . |
| | a | b | c | d | e | f | g | h |

Pawn Displayed with P character in the project. Can move one square or two squares forward if it is in the 2. row, otherwise it can move one square forward. The table given below shows a pawn which is initially in h2 and which squares it can go. Pawn can move at least to 1 and at most to 2 different squares on the board.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | . | . | . | . | . | . | . | . |
| 7 | . | . | . | . | . | . | . | . |
| 6 | . | . | . | . | . | . | . | . |
| 5 | . | . | . | . | . | . | . | . |
| 4 | . | . | . | . | . | . | . | P |
| 3 | . | . | . | . | . | . | . | P |
| 2 | . | . | . | . | . | . | . | **P** |
| 1 | . | . | . | . | . | . | . | . |
| | a | b | c | d | e | f | g | h |

# 2 Input

1. The program will read three characters from the user.
   - First character is the type of the piece on the board. Can be R, N, B, Q, K, P.
   - Second character represents the column character where the piece originally stands. Can be a, b, c, d, e, f, g, h.
   - Third character represents the row character where the piece originally stands. Can be 1, 2, 3, 4, 5, 6, 7, 8. **Attention the third character is NOT A NUMBER. DO NOT READ INTEGER**.
2. If user enters input outside the ranges, the program will display messages:
   - If user enters type of piece wrong, program will display WRONG PIECE
   - If user enters column character wrong, program will display COLUMN OUTSIDE RANGE
   - If user enters row chracter wrong, program will display ROW OUTSIDE RANGE
   - If user enters two or more of the characters wrong, program will display only one message. For example if the user enters type of

piece wrong and column character wrong, program can display WRONG PIECE or COLUMN OUTSIDE RANGE. **DO NOT DISPLAY BOTH MESSAGES.**

3. The program will read three characters **ONLY ONCE**.

# 3 Output

The program will print out all possible squares that the given place can move. The possible squares are printed one by one separated by one space character. The possible places can be written in any order. If there is an error with the input, the program will only display the error message. All possible messages are given in the section above.

# 4 Sample Inputs

- R d 4
- N c 5
- B e 4
- Q b 3
- K f 6
- P h 2
- A c 6
- C i 7

# 5 Sample Outputs

- a4 b4 c4 e4 f4 g4 h4 d1 d2 d3 d5 d6 d7 d8
- a4 a6 b3 b7 d3 d7 e4 e6

- a8 b7 c6 d5 f3 g2 h1 b1 c2 d3 f5 g6 h7
- a2 a3 a4 b1 b2 b4 b5 b6 b7 b8 c2 c3 c4 d1 d3 d5 e3 e6 f3 f7 g3 g8 h3
- e5 e6 e7 f5 f7 g5 g6 g7
- h3 h4
- WRONG PIECE
- COLUMN OUTSIDE RANGE

# 6 Submission Guide

- Submission deadline is 5 November 2003.
- You will submit **ONLY** source code (.c file **NOT CPP FILE**) of your program to the FTP site ftp://haydut.cmpe.boun.edu.tr with the user name **cmpe150** and password **150cmpe**. You will submit the program to the **proje-teslim** directory.
- Name of your project as yournumber.c. For example, if your student number is 9930376 then you will submit 9930376.c file.
- Note that the FTP site will be open between the dates 3 November 2003 and 5 November 2003.
- The FTP submission directory is write-only, so you can not overwrite existing files or can read other's projects. Therefore you can not submit your project twice (you can not upload your program twice).

# 7 Final Remarks

- You will **ONLY** submit the source code using FTP. No other submission is required.
- Commenting and programming style (identifier names, indentation, function usage) of your program will affect your grade.

- Deadlines are sharp. There will be a %20 decrease per day for late projects.
- Please note that the computers in the PC labs may be unreliable, down on the date of submission, inadequate, slow, etc. Please try to finish your projects 48 hour before the deadline to compensate this kind of unplanned problems.
- You are also responsible for reading and understanding the course policy written on the web page of this course. Before submitting your project, read the policy of this course from http://www.cmpe.boun.edu.tr/courses/cmpe150/fall2003/policy.html
- For any further questions on this project see Serdar Sali (serdar_sali@yahoo.com).