Final Year Project Report

Nine Men's Morris
(Android Game)

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Abstract

Project is based on problem-solving strategies supervised by Sir Abu Bakar Siddique. The aim of this project is to develop an Android based application which will be capable of playing the game "Nine Men's Morris".

We decided to create an Android application of Nine Men's Morris as our final year project because we think that it is a challenge for us to build such thing on android platform and attract the Google market user towards our game. This game can be categorized as an educational application because it lets user to apply their thinking skills and use predictive skills of their mind while playing the game. This game can be very efficient for the students to keep their brain active which may help them in studies as well. Building this project also provides us a good opportunity to learn more about distribution and game itself in particular. However there is one more factor which attracts us to choose a game for our final year project that people nowadays are fond of playing games and they love entertaining applications. "Nine Men Morris" not only entertain the person who plays it but also makes the user to use his/here tactical skills. More over android devices are available at very less prices so anyone having a android device shall be able to play this game.

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Description of Project

Project is based on problem-solving strategies supervised by Sir Abu Bakar Siddique. The aim of this project is to develop an android based application which will be capable of playing the game of Nine Men's Morris.

Features of the game:

- Play with android
- Play via Bluetooth
- Play via Internet
- Play on same device
- Play – Free Play Mode

All of the modules which are mention above will be in our end product.

Explanation of Features:

Play with Android (Level Mode):

“Play with android” is basically a level mode. In this mode user can play the game at very basic level. At initial stage, only first board and novice level is unlocked whilerests of levels are locked. After successfully completing the Novice level, player will be able to go on to the next level i.e. Amateur. In this game we have five levels and three boards which have been mentioned below.

Boards:

- Regular board
- Mobius Board
- Twisted Board

Levels:

- Novice
- Amateur
- Professional
- Expert
- Grand Master

Free Play Mode:

“Free Play” is a mode in which all levels are already unlocked at the beginning. If any user wants to play game of any level at any board, he can choose the level by himself and play the game. There will be no restrictions upon him to clear the previous levels.

Play via Bluetooth:

“Play via Bluetooth” is a mode in which user can play game with his friends by selecting the board and sending challenge to his friend via Bluetooth. But the condition is that both devices should have “**Nine Mens Morris**” game installed and the device should support Bluetooth.

Play via Internet:

"Play via Internet" is a mode in which user can play game with his friends, family or any other user on the internet. Player must register himself first and then By selecting the board, player can access the internet game mode and send challenge request to other users of "**Nine Mens Morris**" game.

Play on Same Device:

"Play on same Device" is a mode in which two players can play game on the same device. There are no conditions or medium of communication required. Both players can play on the same device turn by turn.

Aim and Scope of Project

Aim of this project was to design a game which will help different users to improve there thinking and problem solving skills by playing it. The idea was to implement a mobile based application that will allow user to play the game on their android devices anywhere, any time. The mobile app contains different features to facilitate the user at any time.
Application will contain different modes but the easiest mode of game is to play "**Free-Play"** modeon novice level. Moreover we will discuss entire project in the upcoming chapters.
But our main aim was to learn **artificial Intelligence** and how to make effective communication between two devices using different mediums like Bluetooth, internet and Google market apps which is also known as play store.

Challenges and why Android:

We had to face different kind of challenges to implement this game as an effective end product. The one major challenge we had to face was to establish a proper connection among two devices via Bluetooth and internet. But after exploring android we were able to do this successfully.To get attention of play store and to make this game attractive we also added animations in our game.Another reason for choosing **Android** is because currently it is capturing huge market of mobiles industry.
Technically we chose Java language and Eclipse tool for our development. Because both are currently in demand of industry and has different open source facilities for novice developer. For adding artificial Intelligence concept we did research and evaluated different types of problem

solving algorithms. In the end we found min-max algorithm as an effective solution for our application.

Importance of Games:

People love games. One of the many reasons games are important to education and give training. But games almost never correctly train you in what they are supposed to: SimCity, which is a game where u build cities and manage houses, doesn't prepare you for a career of urban planning, Civilization doesn't prepare you for a career of world leader, Guitar Hero doesn't prepare you to be a rock guitarist, Flight simulator doesn't make you fly an airplane, Need for Speed doesn't teach you to drive a car. First person shooters, for example, teach you to run around your enemy in circles, jumping, while you wildly shoot at them but even that doesn't make you a combat hero or a soldier.

So if games aren't great at teaching specifics, what's the point of playing games?

The point is that, games help us learning how to learn. It gives us a brief preview of how things are. Many of them are just imaginary and far from reality but even then it can make you think more creatively and possibilities which can occur in near future. Many of the games are very informative and make us learn about a lot of things.

Board games:

Board games are quite different than other games. They help us sharpen our problem solving skills. Strategy is another huge component of board games. Children should quickly grasp that decisions they make in the beginning of the game have consequences later on. Cause and effect is elegantly displayed in every board game you will ever play. Though in some board games there is very little decision making involved, they will still realize that different rolls lead to different squares that will lead to different outcomes. Pattern recognition is exceedingly important in board games, school, and jobs

Another very important aspect of playing games is to be self motivated. Making scores, measuring your progress is a common aspect while you play games. Leader boards are useful not only because you're competing with everyone else but also because you're competing with yourself, the old you.

Board Games for Children Learning:

Classic board games can help make your children think smartly and more actively. If they play board games in their early ages, Not only will they practice basic reading and math skills in the school, but they will also learn problem solving, strategy, and critical thinking skills by playing board games .

Even before your children reach school age, board games can teach them valuable skills. Playing these games can better prepare them for their school lessons and maybe for real life problems as well.

Pre- school board games that can make your child smarter:

- **Candyland**

With this classic board game, younger children will learn about taking turns, cause and effect, and especially colors. Since, instead of using a die or spinner, Candyland used colorful cards to determine a move, the children must recognize basic colors in order to play.

- **Chutes and Ladders**

In the board game Chutes and Ladders, children will learn more about counting and taking turns. Also, if you discuss the small pictures by the chutes and ladders on the game board, this board game can help your children learn about positive and negative consequences of their actions.

- **Memory Match games**

These games consist of a group of cards on which there are printed pairs of pictures, words, numbers, colors, or anything else. It is easy to create this type of game yourself. These memory match games will help your child improve their memory skills, and to recognize difference in pictures or patterns, a valuable skill when learning many other things.

Playing board games can also help older, school age children. They are very useful to cement ideas and concepts in a child's head and provide entertaining and educational hands-on practice of real world skills.

Five board games and how they will help your children learn:

- **Monopoly**

Monopoly can teach your children a multitude of subjects. They practice addition by adding the dice together to see how far they move. They must know how to add the money together and make change if necessary. Children's reading skills will be called into use with the Chance and Community Chest cards as well as the property names and information.

- **Checkers, Nine Men Morris & Chess**

Checkers, Nine men Morris and Chess are the ultimate Strategy games. These classic board games will utilize your children's' critical thinking skills and their ability to predict several moves in the future.

- **Sorry, Ludo, Trouble**

Simple like Sorry, Ludo, and Trouble will help your children reinforce counting and adding skills. As they get more skilled, your children can learn about strategy as well: is it better to knock the opponent back to start, or advance further yourself?

- **Scrabble**

Scrabble comes in different forms. The classic scrabble will obviously help your children discover new words and reinforce their spelling skills. There are also junior scrabble games in which you must build sentences out of word tiles rather than words out of letter tiles. Scrabble is a great board game to help your child learn.

- **Clue & Guess-Who**

Clue is the classic board game of "Who Done It?" and Guess Who is a game in which opponents ask yes and no questions to deduce what character their opponent has on a card. Both of these games are very good for helping your children learn deductive reasoning and critical thinking skills.

Playing board games is a fun way to help your children learn. From basic skills to more complex subjects such as economics and strategy, board games provide a fabulous way to get the hands-on experience with topics that are vital to their learning and their entire lives.

Board Game helps to improve thinking Skills of Adults:

Most parts of the body change as people age. Strength deteriorates. Memory slowly weakens. These changes highly affect the wellness and whole being of an adult. Although these are very common and can be part of aging, one can do certain things to keep both mind and body healthy. For example if we want to stay healthy physically we have to keep doing regular exercises'. Similarly if you want to maintain a sharp memory, it is very important to use your mind always. Just imagine if you are not going to make use of your brain, chances are your mind will forget how to think actively. The best thing to do is to keep your brain active to make the most use of it. But the question now is how to keep your brain cells active? Well, brain exercises and games can produce impressive benefits.

Here are a few board games that can help enhance brain function and boost memory of Adults.

- **Nine Men Morris**

This kind of board game demands the players to have good strategic ability. Playing nine men Morris can be very fun and thrilling. Players must be very careful and vigilant with every move. It is important do make decisions where to place pieces at first because result of the games depends a lot on where you place pieces. While playing this game you have to think simultaneously to make you own mill and at the same time to prevent the opponent from making a mill.

Other Board Games:

- **Scrabble** – Playing scrabble is very helpful to the brain. Primarily, this board game can help stimulate the memory. Obviously, players must think of good words to assemble on the board. But if you want to win, you should consider forming incredible words to get high scores. Another notable benefit of scrabble is helping you polish your strategy building skill. Of course, you will not simply put whatever word you want. It takes a good technique to win this game. Thus, thinking of words and tricks can keep your brain cells fully active.

- **Chess** – With the strategic nature of the game, surely, chess can help improve brain function. Playing the game does not follow any pattern. It is different every time players play it, thus giving no complacency. The harder the moves the better as it lets you think of

ways to counteract the move of your opponent. If you compete against chess masters or excellent players, your strategic ability will surely be tested. But it is not a bad thing. Indeed, it is even more helpful. The more difficult the level the more adults need to use their brain to think.

Notice all these games require deep thinking. When you think and use your brain, all nerves and cells in your brain are functioning. This can be very helpful to remain safe from any kind of mental disorder by keeping the bran idle. And thus, it is highly advisable for adults to play board games to help strengthen the mind power and memory.

Introduction to Game

Nine men Morris is a Strategy Board game First Emerged from Roman Empire. The game is also known with some other names for example, Nine Man Morris, Mill, Mills, The Mill Game, Merels, Merrils, Merelles, Marelles, Morelles and Nine Penny Marl. They game has also been called Cowboy Checkers. This game is a solved game in which either player can force the game into a draw. A solved game is a game whose outcome (win, lose, or draw) can be correctly predicted from any position, given that both players play perfectly.

History of the Game

Nine Men's Morris is one of the oldest games in history. The word Morris comes from the Latin word merellus, meaning the corruption of counters. The earliest known diagram of this game was found in an Egyptian temple in Kurna Egypt, dating around 1440 BC. Other boards have been discovered in Ceylon of Sri Lanka (c. AD 10) and in the Gokstad Viking ship (c. AD 900). In Ceylon two boards are cut on the steps leading to the hill at Mihimtali and others are found on a rock near Lankarama dagaba. Evidence of the board scratched in the ground has also been found in the Bronze-Age Ireland, ancient Troy, and the Southwestern United States. In the US, Kere, Tigua, Tew and Zuni Indians played a version of the game called paritariya, picarva, and pedreria. To the ancient Celts, the Morris square was sacred. The central square known as the Cauldron or Mill was a symbol of regeneration while the lines and squares coming out from the middle were symbols of "the four cardinal directions, the four elements and the four winds"(Mohr 30).

Although it is not known when Nine Men's Morris reached Britain, it was widely played during the Middle Ages, along with similar games such as Three, Six, and Twelve Men's Morris. The game was most popular in the 14th and 15th Century. During the fourteenth century, Nine Men's Morris boards were a part of a set of games that were played on "shallow boxes with hinged lids" . When the box was closed, one surface had a chessboard while the other had a Nine Men's Morris board. When opened, the box was used as a backgammon board. The game was also frequently played with pebbles on engraved boards in taverns or on boards drawn in the ground with a trowel. The board was found scratched onto the seats of many British cathedrals, and on the "steps of Furness Abbey, tombstones at Dryburgh Abbey, Worksop, and Arbory in the Isle of Man, at Norwich, Dover, Helmsley, and Scarborough Castles, and on stones built into the walls of churches, as at Hargrace (Northants), Ickford (Bucks.), Sparsholt (Berks.), and Kirkby Underdale (Yorks.)" (Murray 44). By the late 16th century, the game was called Merels from an Old English word "mere" meaning boundaries.

Shakespeare refers to Nine Men's Morris in A Midsummer Night's Dream, when he wrote "The Nine Men's Morris is fill'd up with mud" (Act 2, Scene 2). In the passage, Titania, the queen of the fairies blames Oberon for causing chaos in the world. The rain has not stopped causing disease and the Nine Men's Morris Board to be unplayable. This passage is often cited as evidence that the game was played outdoors. The game is also mentioned in the medieval literature of France and Germany. The game has also been played with real life pieces. On June 24, 1897, boys and girls were used as pieces at Saffron Walden. During World War I, new versions of the game sprung up. Known as Trencho, these versions of Nine Men's Morris were inspired by trench fighting.

Game Rule (Game Mechanics):

The game is played on a board. The board consists of a grid with twenty-four intersections or points. The game is played between two players. Each player has nine pieces, usually colored black and white. Players try to form mills. Mill refers to three of their own pieces lined horizontally or vertically which allows a player to remove an opponent's piece from the game. A player wins by reducing the opponent to two pieces, or by leaving him without a legal move.

The game proceeds in three phases:

Initial Point (On game start)

Placing pieces on Vacant Points:

The game begins with an empty board. The players determine who plays first and then take turns placing their pieces one per play on empty points. If a player is able to place three of his pieces in a straight line, vertically or horizontally, he has formed a mill and may remove one of his/her opponent's pieces from the board and the game. Any piece can be chosen for the removal, but that piece should not be in the opponent's mill.

Moving pieces to Adjacent Points:

Players continue to alternate moves, this time moving a piece to an adjacent point. A piece may not jump another piece. Players continue to try and form mills, and remove their opponent's pieces in the same manner as in phase one. A player may break a mill by moving one of his pieces out of an existing mill, then moving the piece back to form the same mill a second time, or any number of times; and each time removing one of his opponent's Pieces. The act of removing an opponent's Piece is sometimes called "pounding" the opponent. When one player has been reduced to three Pieces, Third Phase begins.

Jumping Point to Point (Flying Mode):

When a player is reduced to three pieces, there is no longer a limitation of moving to only adjacent points: The player's pieces may jump from any point to any vacant point.

Some rules sources say this is the way the game is played, some treat it as a variation, and some don't mention it at all. A 19th-century games manual calls this the "truly rustic mode of playing the game". Flying was introduced to compensate when the weaker side is one man away from losing the game.