

Pat Project

Specification document



bryce grahn grade 12 key 1

Table of Contents

[Description: 2](#_Toc519944389)

[Program functions: 3](#_Toc519944390)

[Goals and success criteria: 5](#_Toc519944391)

[User interface 6](#_Toc519944392)

[Help: 7](#_Toc519944393)

[Data storage: 8](#_Toc519944394)

[Hardware software and requirements: 8](#_Toc519944395)

# Description:

EAT IT: A Snake constantly moves around the board. The player controls the direction the "head" of the snake moves; either up, down, left or right in a 2D playing field. The snake must try to eat apples that randomly appear on the screen. The player does this by hitting the apple with the snake’s head. Eating an apple causes the snake to grow in length, one unit at a time. The game ends if the snake crashes into the edge of the board, itself or random blocks that may appear and the number of lives is reduced to zero. As the game progresses the player may obtain power ups by eating special apples that slow the speed, gain a bonus life, earn double points for 20 seconds or obtain invincibility for 20 seconds. The user has the option at the beginning of the game to select the help, play, difficulty or exit option. With a change in difficulty leads to different game layouts, quicker speeds and additional objects that the player must dodge.

# Program functions:

This program should be able to:

* 1. Difficulty level can be selected as required.
  2. The program will then load a playing field (either the easy, normal or hard field type with randomly generated lilies or sandstone blocks). The playing field consists of 66 blocks in width and 36 blocks in height with each block being 6mm in length and height. Each block will act like a single pixel on the screen Eg: the red apple will be one block
  3. At the top left-hand corner will be the score and its corresponding value which starts at zero. The value will be stored in the program and constantly saved to the database. This value will constantly be updated as the game progresses. Eating an apple will increase the score one point at a time.
  4. At the top right-hand corner will be the players lives and its corresponding value which is defaulted to 3 at the beginning of the game. This value will be stored and increase by one if a special extra life apple is eaten and decrease by one if the snake crashes into the edge of the board, itself or random blocks located around the playing field.
  5. The top middle of the screen when a golden apple is eaten will display randomly generated powers and a countdown timer of 20 seconds depending on the power type.
  6. The program then loads a snake around the top left of the screen, 3 units long (and an additional 5 virtual units used when reversing the snake).
  7. An apple will randomly generate somewhere on playing field and its co-ordinates will be stored.
  8. The snake will start moving:
     + The snake’s default direction is set right.
     + On clicking of either the up, down, left or right arrows the snake head will move in that specific direction and update it’s X,Y co-ordinates accordingly.
     + Each unit of the body of the snake will follow the co-ordinates of the previous snake unit ahead of it such as the head each time the head moves a unit.
  9. Once the co-ordinates of the apple and snake head are the same, the snake has therefore eaten the apple and the following occurs:
     + The score will increase by one point (unless double points is activated)
     + The apple disappears
     + The length of the snake increases one unit at the back and the length, co-ordinates and other details are updated in their corresponding coding fields.
     + Another apple randomly appears.
  10. The player may obtain power ups if the head touches a special golden apple that may appear randomly which:
      + Slows down the speed by increasing the delay factor
      + Earn double the number of points for 20 seconds
      + Obtain invincibility for 20 seconds
      + Gain an extra life
      + May or may not change images
  11. If the head of the snake hits either itself, the side walls, lilies or sand-blocks their co-ordinates will be the same and thus a collision has occurred. The snake will flash or reverse depending on the collision and the number of lives will reduce by one.
  12. Game over occurs if the number of lives decreases to zero
  13. A small screen will pop up asking if the player wants to save his/her score, if yes, the player enters a username and the score is stored within a secure database.
  14. And the player will be taken back to the main menu and may check his/her high-score if needed.

# Goals and success criteria:

* Movement between main menu is smooth and successful, eg: clicking the difficulty button will open the correct window
* The program displays the correct details and menu for which ever option was clicked
* Updates level difficulty into system and correct playing field is displayed
* Has a back button that works and takes the player back to the previous interface
* Has a home button that takes the player back to the main interface.
* Playing field with snake around the top left is successfully generated
* Score is set to zero
* Lives is set to three
* Lilies and pyramids randomly generate
* Apple is randomly generated
* Snake moves and can be controlled using the up down, left right arrows
* Snake successfully moves in that direction and the snakes body follows the previous unit
* On eating of an apple:
  + New apple generates
  + Old one disappears
  + Snake increases 1 unit in length
  + Score updates
* Golden apples randomly generate with specific powers that bring about a change in the playing field once consumed
* Proper actions take place when a collision occurs and game over takes place when the number of lives decreases to zero
* Score and username is updated into the database
* Player is brought back to the main menu

# User interface

The Main interface consists of a screen window that occupies the entire computer screen, the back-round of all the varies interfaces will contain snake graphics. The main interface has four options: Help, play, difficulty and exit. Each option will take the player to a different interface containing the corresponding information eg: clicking the difficulty option will take you to a different interface with an easy, normal or hard option. At the top left-hand corner of each interface is a back option which will take the user back to the previous interface when clicked. There may also be an optional home button depending on the interface. When playing the game click the, arrow keys to change the orientation of the snake. Your score will be displayed in the top left-hand corner. The number of lives will be displayed in the top right-hand corner and the powers with the corresponding countdown timer will be displayed at the top middle. Once game over has occurred another interface will pop up asking if the user wants to save his score and then provide a username. If not the program will delete the score. Once this is done the player will be redirected to the main menu. The player can go to the help interface and choose a specific high score table if they wish to see if their high score is within the top 20.

# Help:

Consists of 3 sections:

* Controls :
  1. A picture diagram of a key board will be displayed with the useful keys isolated:
     + Up arrow: changes the snakes direction to upwards
     + Down arrow: changes the snake’s direction to downwards
     + left arrow: changes the snake’s direction to left
     + right arrow: changes the snake’s direction to right
* How to play :
  1. EAT IT: A snake constantly moves around the board. It is your goal to control the direction the "head" of the snake moves, either up, down, left or right in a 2D playing field. You must get the snake to eat apples that randomly appear on the screen. You do this by hitting the apple with the snake’s head. Eating an apple causes the snake to grow in length, one unit at a time and your score increases by one. The game ends if the snake crashes into the edge of the board, itself or random blocks (lily or sand-stone blocks) that may appear and your lives are reduced to zero. As the game progresses you may obtain power ups by eating special golden apples that slow down the speed, earn double points for 20 seconds, obtain invincibility for 20 seconds or a gain bonus life. Good luck!
* High-score boards: Three high-score windows for each of the difficulty levels will display their relevant top 20 players and their corresponding scores.

# Data storage:

Database:

* scores and their corresponding usernames will be stored in a database table and relative SQL statements will be used to display the high scores for the user

Text file:

* Contains the how to play information

Files:

* Will store image graphics such as the back round

# Hardware software and requirements:

Hardware:

* Processor: intel(R) Pentium® CPU G630 @ 2.70 GHz or newer, iMac "Core i5" 3.2 27-Inch or newer
* RAM: 4GB or more
* Screen 1080 x 1080
* Keyboard
* mouse
* HP pro or any other Microsoft based computer
* Any apple computer
* 250GB hard drive

Software:

* Netbeans 8.1 or newer
* System type: 64-bit operating system, x64- based processor
* Notepad
* Windows 10
* OS 10
* Microsoft Access 2007 or later