# VP Final Project

## Team #3

**Team members:**
Mariam Salama 37-1613
Abdulrahman Fekry 37-8877
Khadija Khaled Hammoud 37-4867
Heba Ahmed 37-5660
Nour El-Shamy 37-2082

# Target

The target of this project is to teach beginners some of the basics and syntax of the Java language in the form of a game. The player constructs basic statements from the given blocks. The player has an initial position and a target position and the aim is to construct correct Java statements that would move the player just the right number of steps and in the right direction to end up in the right target position and win the game. The player will be given instructions on how to move. The position consists of x and y coordinates. x+1 moves one step to the right, x-1 moves one step to the left , y+1 moves one step upwards and y-1 moves one step downwards. The player basically has two missions to accomplish, the first is to write a code in the correct java syntax, in order to not get an error, and the second is to correctly estimate the number of steps needed to reach the target position, in order to win the game.

# Components

The program will consist of blocks (“int i=0; while(i<...) { i++;”, “if”, “else”, “{”, ”}”, “x+1;”, “x-1;”, “y+1;”, “y-1;”), that will appear in the GUI screen, as well as a game area on which the initial and target positions will be marked. There will also be a “run” button to execute the code and accordingly move the position.

# Syntax

Statements in correct java syntax will be accepted and executed and position will be changed. Otherwise, an error message will appear.

**examples:**

int i=0; while(i<3) { i++; x+1;} —> Accepted(code moves the position of the player to the right by 3 steps)

int i=0; while(i<3) { i++; x+1; —> Rejected(code missing “}”)

int i=0; while(i<3) { i++; if(i>3) {y+1;} else {y-1;}} ) —> Accepted (code checks the value of y and accordingly moves the players position upwards or downwards)

( if(i>3) {y+1;} else {y-1;} ) —> Rejected (i not initialized)

( int i=0; while(i<5) {i++; if(i<3) {x-1;}} ) —> Accepted (code checks the value of y and accordingly moves the players position upwards or downwards)

( int i=0; while(i<5){i++;  else {x-1;}} ) —> Rejected (else without an if)

## Operational Semantics

There is only one variable that can change during the game which is the position of the player (x and y).

State —> [x,y]

1- x+1 —> [x’,y]

2- x-1 —> [x’,y]

3- y+1—> [x,y’]

4- y-1—> [x,y’]

## How to Play

To play the game, run the GUI class, a frame will appear with homer and a donut. The aim is to construct a code which moves homer to the donut’s location in order to have his donut!

In order to construct the code, press on the buttons with the desired code snippet. The code will then appear in the text area on the lower left corner of the frame, where the player will be able to make the necessary adjustments to get the code to operate. The instructions of the adjustments appear when hovering over the chosen button. To clarify, if the player hovers over the “if” button a tooltip appears with the text “Add i conditions (Operator and number) in the text area after pressing”.

When the player thinks the code is both, syntactically correct and will move homer to the donut, the player should press the play button on the upper right corner.

If the code has any syntax errors the player will be notified and will have to reset the game and start over. The donut’s position will also change.

If the player has no syntax errors, either a “Try again” or a “Congratulations” notification will pop.

If the player wants to play again, the reset on the upper left corner button will reset the game.