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# 2-player snake game

## *Detailed manual*

### **Link to our project on github:**

<https://github.com/university-projects-organization/mzapo-2-player-snake>

### **Program structure:**

In program we use two third part libraries. The first one is apo\_library from the APO subject. The second is open stb\_library (<https://github.com/nothings/stb>), which helps working with JPGs and PNGs.

### **Header files:**

food\_structure.h - includes structure declarations for apples.

records\_structure.h - includes structure declaration for records menu.

settings\_structure.h - includes structure declaration for settings menu.

snake\_structure.h - includes structure declaration for game snake.

wordbuffer\_structure.h - includes structure declaration for word picture from font.

pixel\_structure.h - includes structure declaration for screen pixel.

### **Source files:**

main.c - main class for running program.

collisions.c - class with all functions for checking collisions.

- checkSnakeCollision() - checks all snakes collisions by calling other functions from collisions.c
- checkWalls() - checks snake collisions with walls.
- checkFood() - checks snake collisions with food by calling other functions from collisions.c
- checkApple() - checks if the apple has been eaten.

food.c - class with all functions for apples.

- setFoodImage() - sets image of current food.
- allocateFood() - allocates food structure.

- freeFood() - deallocates full food structure.
- generateApple() - generates random position of apple on the map.
- setFood() - sets apple on the position on the screen.

game.c - class with all game functions.

- setUpGame() - sets up all game settings.
- freeAllocatedMemory() - deallocates all remaining memory.
- gameOver() - creates game over menu.
- game() - starts game.

game\_menu.c - class with all functions for main game menu.

- endGame() - calls before the end of the game to deallocate everything.
- gameMenu() - creates main game menu.

knobs\_control.c - class with all functions for controlling knobs.

- knobRotated() - returns the number of rotates.
- knobUnpressed() - waits, when the knob will be unpressed.

records.c - class with all functions for records menu and saving record from the game over state.

- allocateRecords() - allocates records structure array.
- freeOneRecord() - deallocates one record structure.
- freeRecords() - deallocates array of record structures.
- selectColor() - creates string from the color (number).
- readLine() - reads one line from records.
- readRecords() - reads full records file.
- displayOneRecord() - displays one record line on the screen.
- recordsMenu() - creates record menu.
- setNewRecord() - allocates and sets new record.
- saveRecords() - saves all records in the file.
- writeRecord() - writes one record in the file.

screen.c - class with all functions to display on the screen.

- allocateScreen() - allocates screen buffer.

- freeScreen() - deallocates screen buffer.
- imageToPixelArray() - converts image to array of pixels.
- setBackground() - sets background image on the screen.
- setSelector() - sets selector on the screen.
- loadScreen() - displays screen buffer (pixel array) on the screen.

settings\_allocate.c - class with all functions to allocate settings structure.

- allocateSettingsParameter() - allocates structure for settings parameters.
- freeSettingsParameter() - deallocates structure with settings parameters.

settings\_menu.c - class creates settings menu and saves settings menu choices.

- setSettingsMenuBackground() - sets settings background.
- loadSettingsMenu() - loads settings menu.
- menuPosition() - returns actual position in menu.
- switchColor() - chooses and returns color for LED according to player color choice.
- settingsMenu() - creates settings menu.

snake.c - class with all functions for snake.

- setTile() - sets snake tile.
- allocateSnake() - allocates snake.
- freeSnake() - deallocates snake.
- moveForward() - moves snake to new position.
- up(), down(), left(), up() - rotate tile skin according to direction
- directionSwitch() - calls one of the functions to rotate tile skin.
- setHead(), setBody(), setTail() - set tile skin according to the body part of the snake.
- setSnake() - calls functions to set full snake skin.
- chooseDirection() - sets snake direction according to knob position.
- chooseColor() - sets snake skin color according to choice.

word\_from\_font.c - class creates word in pixel array from the font.

- allocateWordBuffer() - allocates buffer for word.
- freeWordBuffer() - deallocates buffer with word.
- setSymbol() - converts symbol from byte font to pixels with given scale.
- makeWordBuffer() - creates and fill buffer with word.

- setWord() - sets word on the screen.

## **Program launch:**

For installing download .zip archive. After that change ProxyJump on your your\_login@postel.felk.cvut.cz in SSH\_OPTIONS and change IP to the actual MZ\_APO board IP.

All sources are written in the Makefile. The program is compiled with the standard “make run” command. Copying directories via ssh key.