1. Description of Programming Concepts

* Variables

The variables are very important when it comes to developing a program. In my case, I had to store many different variables so I can easily use them later on. I used variables to determine the colours, height/width of images and display, for loading images, and counting the collected points and lives. This way, it made the program short and easier as short program is the best when getting all the requirements done. Also, there were a couple of variables that were used to assign some Boolean expressions such as “True” and “False”. This further helped me when I had to use loops further ahead in the program. Variables are really helpful because they act like a reference as you can go to that anytime during the program once the variable is assigned. Also, variables have flexibility of changing in the program if it needs to be changed at a certain point. This is why variables are important and it really helped me program the game.

* If-Statements

I used many “If-Elif-Else” statements in my program to determine when to allow the selection structure to be true. In these statements, whenever there is a true value, the computer seems to follow that. Therefore, it made my life much easier because I added if else statements to allow the score, lives and speed of the images to increase. This way, it makes the program more user-friendly with a challenge of competition for score. In addition, whenever I needed to move the basket left or right, I just simply put the “if statement” so that the computer automatically recognizes when to move the basket right or left with certain amount of pixels. Another area I used the “if statement” is when the user starts, pauses, or loses lives in the program giving and option of quitting. So that when they quit, the program would automatically close. If statements were really supportive to me in the program.

* For-loops

For loops are just as important as any other structures in programming. For loops are used in several different ways such as repeating a certain function. Loops are very helpful in terms of writing less code and the best program at the same time. This is so because it shortens the user’s program intensively allowing the program to be short and simple so it wouldn’t use too much memory on the user’s PC. That would also help the program run very smoothly. I integrated “for loops” in my program to always get the user’s command so it follows the user’s command efficiently. Loops were actually very helpful to me because it reduced the code and saved my time without writing the same codes over and over again. Loops help meet the requirements of programs in an efficient and effective manner.

* While-loops

Using while loops allows us to determine when the loops starts or ends. This way, the program would start when you would like it to start. While loops are also very controllable because they execute the program repeatedly on a given Boolean condition. Such as in my game, I had several different screens (Intro, Pause, End) and to determine when this shows up, I had to use the while loop so that when a statement I would like to accomplish is true, it follows that command. For example, when the user used up all of the lives, the game goes to the ending screen. This takes place because there was a while loop in a function that was defined to let the computer know if the game ended or not. I did use some while loops to help me loop some conditions in an organized fashion.

1. Description of Input and Output Components

* Buttons

Buttons are input components because it sends bytes of data into the computer to let the computer know that the user is interacting with something. In my case, I have two buttons to control the movement of the basket image in the game. One button was determined to move left and one was determined to move right. Whenever the user presses a button, the basket starts to move because the button acts like a switch. As a switch’s role is to become on and off, same goes with the button. These actions are sent into the computer where it is processed and outputted onto the game screen. These buttons are used to collect the apples in the game and achieve a high score. Buttons do relate to binary code such as on and off. As the user clicks the button, it processes on (1) and as the user lets go, it processes off (0).

* LEDs

Light Emitting Diodes are output devices they output light when it fulfills a function in a program. In my program, I have two LEDs, one that is red and one that is green. The red one flashes when the user misses the apple or collects the bomb by accident. This way it helps the user know what is actually happening in the game. The second LED that I used is green. The green LED flashes when the user collects a normal or golden apple. This also allows the user to interact with the game. Of course, the LEDs colours determines their stereotypical function. When a light flashes red, it usually means that it’s giving you a caution or warning. Whereas if a green light flashes, it is the sign of clear and that everything is going well. That is how I interpreted the LEDs in my program. LEDs are also like binary code because they can be controlled with on and off switches using a program.

* Buzzer

The buzzer is also related to binary digits. This is because when the buzzer is programmed to follow the “ON” command, the buzzer creates a noise. When the buzzer is programmed to be off, it stops making the noise. In my program, the buzzer makes a long sound when the user runs out of all the lives. This also means that there is a time delay so that the buzzer sounds for a long time. To make the buzzer go off, I had to call a function on it, allow the time delay to take place, and turn it back off. This way it isn’t very annoying to the user and gives a peaceful gameplay. Pretty much almost all electronics run with binary digits with a simple ON and OFF. This could help the programmer make useful inventions and integrate simple electronics with others. Such as creating a joystick with LEDs, Buttons, Resistors and a Parallel port.

* Resistor

Resistors are very important as well because it reduced the amount of electron flowing in a certain area. This helps the electronic subsequent to that receive less electrons so it would simply burn off. In my case, the parallel port supplies 5 volts of power. I needed to add resistors to the LEDs that I used to control the flow and help it from getting burnt. LEDs are very sensitive when there is too much voltage. This is why there are resistors you can use to help reduce the voltage allowing a sufficient flow just perfect for the LEDs. If I haven’t used any resistors, the LEDs would’ve burnt off and eventually ruin the whole purpose of a working joystick. This is why resistors are important when it comes to sensitive electronics which can’t handle much voltage. Resistors come in different resistance ranges, therefore, you can adjust how much resistance you would like by simply picking the right one for your use.