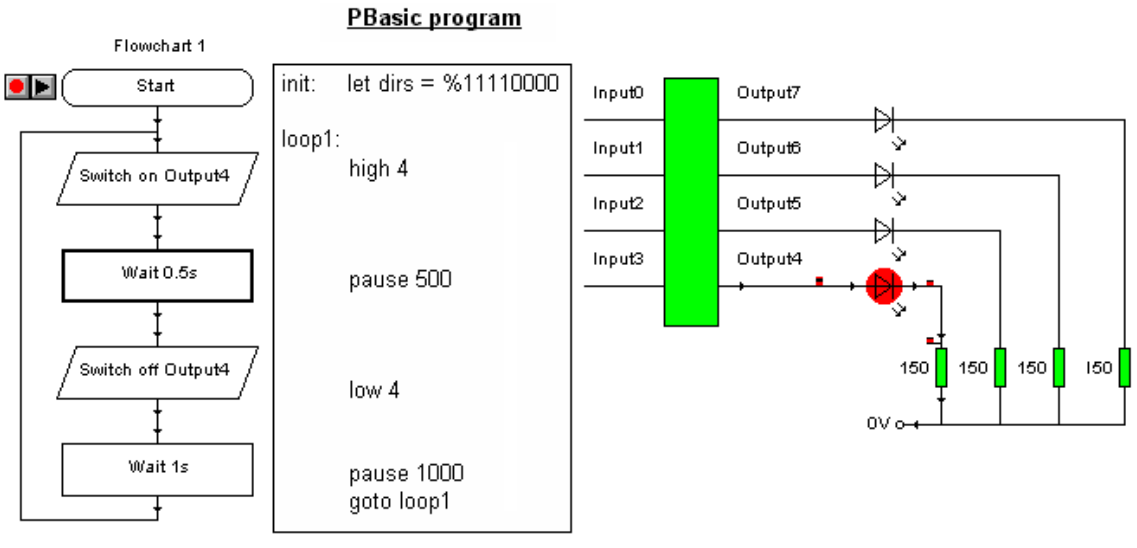
PBasic - outputs, delays and loops

Introduction

Crocodile Technology allows the user to program microcontroller's using a graphical flowchart based system. A some point students of Technological Studies must start to write code in a programming language named PBasic. In this activity you will learn how to relate a simple flowchart with the equivalent PBasic code.

You will learn how to download onto a microcontroller directly from Crocodile Technology. Then you will write the equivalent program in PBasic in a text based program editor and download it onto the same microcontroller.

Task 1



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1. Open Crocodile Technology file Model 1.

2. Make sure the flowchart is running. The lines of the PBasic program have been spaced out to correspond with the flowchart cells. Observe the flowchart running and read the corresponding PBasic commands.

   The "dirs" command is used to set the 8 input/output pins to be used as inputs or

outputs (every pin can be used for input or output as desired).

The "%11110000" part of the code is a binary number (denoted by the %). Using your understanding of binary weighting explain whether "1" or "0" is used to specify that a pin should be used for an output.

3. The PBasic program then has a label called "loop1". This is used to mark a place in the program. Further down the program this label is used again to make the program jump back to the position marked by "loop1". Which command makes the program jump back to "loop1"?

4. The flowchart has cells "Switch on Output4" and "Switch off Output4". What is the equivalent PBasic commands.

5. The flowchart has two delay (or wait) cells. Write down the equivalent PBasic commands and explain the units of time that are used with these commands.

6. Connect the Stamp Controller to the PC using a serial lead. Connect the power supply unit (PSU) to the Stamp Controller.Click on the red circle to the left of the start cell in the flowchart. Click Yes in answer to the question "Transfer flowchart program?".

   You should see a window appear "Programming in progress". After a short while the program will download onto the Stamp Controller board. Disconnect the serial lead from the Stamp controller board.

   What do you observe happening on the Stamp controller board?

7. Now load the Program Editor software. Type the PBasic code shown in the Crocodile Technology simulator file into the Program editor.

   Change "high 4" to "high 5" and change "low 4" to "low 5" (to be different from program already downloaded onto the Stamp controller).

   Close and exit Crocodile Technology then plug the serial lead into the Stamp Controller.

   Download from the PBasic Program Editor the code you have just typed in. Once the download has completed disconnect the serial lead again.

   What do you now observe on the Stamp Controller ?

You have seen how a flowchart can be related to PBasic code.

The pins to be used for inputs and outputs on a Stamp Controller board should be initialised at the beginning of the program.

You have used labels to allow the program to loop and output statements to control the output pins.

Crocodile Technology can be used to download your flowchart onto a Stamp Controller.

The Program Editor software is used to type PBasic code for direct downloading onto the Stamp Controller.

-- END OF ACTIVITY --