

PBasic - inputs, decisions and subroutines

Introduction

Microcontrollers are very often used in applications which require them to read signals from input sensors and control output devices. Flowcharts allow a structured approach to program design. Within flowcharts subroutines provide a method of splitting the program into sections with each section (or subroutine) responsible for one part of the task.

In this activity you will observe a flowchart being used to read an input and control outputs based on the input. You will then download the flowchart onto a Stamp controller board. Once you have done this you will then write the equivalent code in the Program editor software and download it again onto a Stamp Controller.

Task 1

PBasic - inputs, decisions and sub routines

1. Open Crocodile Technology file Model 1.
2. Click on the black triangle to start the flowchart running. Explain what happens and why the flowchart appears to stop.

3. Press the door bell button briefly. Describe the sequence of LED's switching on and off that follows.



4. What is the line of PBasic code that reads the input waiting for the button to be pressed. Explain how this line of code works.

5. Look at the main part of the flowchart. Name the subroutines used. Explain why the subroutines have been given the names they have.

8. Connect your PC to a Stamp controller via a serial lead. Connect the power supply to the Stamp controller.

Click on the red circle next to the start of the flowchart to download the flowchart onto the Stamp controller. Once the download completes disconnect the serial lead. Explain what happens on the Stamp controller.

9. The PBasic code for two of the subroutines has been deliberately omitted. Write the missing PBasic code for the two subroutines in the space below.

10. Now load the Program Editor. Type out all the code given in the simulator file into the PBasic editor. The subroutines are placed after the main part of the program. Usually an "end" command would be placed after the main part of the program and before the subroutines.

Close and exit Crocodile Technology.

Plug the serial lead into the Stamp controller. Download your PBasic code onto the Stamp controller. Once the download is complete disconnect the serial lead.

Explain what happens on the Stamp controller.

In a microcontroller based system the ability to read inputs, make decisions based on these inputs and hence control outputs is fundamental. In this activity you have learned how to do just this in both the simulator and the PBasic code which is downloaded onto a Stamp controller.

A great many applications of microcontrollers in schools can be achieved with the concepts covered in this task.

It's time to start programming your own microcontroller based models.

-- END OF ACTIVITY --