TI-RSLK MAX

Texas Instruments Robotics System Learning Kit

Texas Instruments

Module 6

Activity: General Purpose Input Output

Activity: General Purpose Input Output

Q1 Write C code to calculate the average of 100 numbers. Assume the 100 numbers are in a 32-bit signed array, passed by reference into your function.

```
int32_t Average(int32_t Data[100]);
```

Q2 Write C code to find the maximum of 100 numbers. Assume the 100 numbers are in a 32-bit signed array, passed by reference into your function.

```
int32_t Max(int32_t Data[100]);
```

Q3 Write two C functions to create an input on Port 5 bit 1.

```
void Pin_Init(void);  // initialize P5.1 as input
uint8_t Pin_In(void); // returns 0 if low, and 1 if high
```

Q4 Write two C functions to create an output on Port 4 bit 3.

```
void Pin_Init(void);  // initialize P4.3 as input
void Pin_Out(uint8_t data); // sets P4.3
```

Q5 Write software that initializes MSP432 Port 1, so pins 7,6,5,4 are input and the rest are output.

Q6 The overall objective is to create a **NOT** gate. The system has one digital input and one digital output, such that the output is the logical complement of the input. Implement the design such that the complement function occurs in the software of the microcontroller.

Q7 The overall objective is to create a 3-input **AND** gate. The system has three digital inputs and one digital output, such that the output is the logical and of the three inputs. Implement the design such that the AND function occurs in the software of the microcontroller.

Q8 The overall objective is to create a 3-input **median** gate. The system has three digital inputs and one digital output, such that the output is 1 if 2 or more inputs are high, and low if 2 or more inputs are low. Implement the design such that the median function occurs in the software of the microcontroller.

Q9 Write a main program with the following features. Make all pins on Port 7 inputs, and make Port 1.0 an output. In the main loop, read Port 7 and count the number of pins that are high. If there are 4 or more pins high, set P1.0 high. If there are 3 or less pins high, clear P1.0 low.

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