Automatic hand sanitizer dispensers:

Input: wave hand below dispenser

Output: goo gets squeezed out of apparatus (to fall on hand)

Processing: If the light value drops below the typical range of light values for environmental light (meaning the hand is creating a shadow), then release goo.

Storage: A range of light values for typical environmental light (say 5-10)

Bits testing: 0 means I show my sensor a dark color or light color within the range of light values for typical environmental light (5-10), so no goo is released, 1 means I show my sensor something darker than the acceptable range (like 3), so goo is released

An excellent answer from a student:

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| --- | --- | --- | --- | --- |
| Placing hand beneath sensor. | Dispensation of sanitizer. | If sensor detects object in 1-inch vicinity, dispense sanitizer. If not, do not dispense hand sanitizer. | Distance from sensor to the nearest object. Determined by the sensor. | The cardboard could be placed varying distances from the sensor. In this case, 0 may be 'cardboard is more than 1 inch from the sensor' which would cause no dispensation. A 1 may be 'cardboard is less than 1 inch from sensor', in which case the desired result is that sanitizer is dispensed. |

For the IR example of the quiz, this was a good answer:

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| --- | --- | --- | --- | --- |
| Person walks within the vicinity of the infrared sensor. | The sliding doors open. | If the infrared sensor detects infrared radiation (a person), then the sliding doors open. | The amount of infrared radiation required for the sensor to detect a person, and open the doors. | 0- Not enough infrared radiation for the sensor to detect anything, so the doors do not open1- Enough infrared radiation for the sensor to detect something, so the doors open. |

And this is a bit better (still full credit):

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| --- | --- | --- | --- | --- |
| Someone walks in front of the infrared sensor (door)  | The automatic door opens to let the person in | if there is heat at x, the door will then open, or if there is not enough heat at x the door will not open | the amount of heat a person typically has  | The two bits might be the door will open if it senses “human heat” (1) or the door will not open if it senses less than “human heat” (0)  |

And this is exemplary:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Heat radiating off a human | The doors will open. | If the infrared sensor senses a heat signature of more than 3, the doors will open. If the infrared sensor senses a heat signature of less than 3, the doors will stay closed. | Heat signature on a range of 1-10 | 0 - the cardboard card gives off a heat signature of more than 3 (the door will open); 1 - the cardboard card gives off a heat signature of less than 3 (the door will stay closed) |