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Supermarkets often gather information about their customers and the purchases that they make. This information can be analysed by the supermarket and other companies for a range of purposes.

Some of the information is collected at the checkout, where the identity of the person is read from a loyalty or payment card using RFID (radio-frequency identification) and a barcode reader is used to identify the products being purchased.

By analysing the purchases that a shopper has made, it might be possible to identify such things as whether the shopper has children, is pregnant, or lives in a house with a garden. Other types of analysis might include the amount of money a customer spends, the times that they choose to shop at and the differences in shopping habits of different groups of shoppers.

Describe the principles of operation of the hardware used to collect the information **and** discuss some of the ethical and legal issues that might arise as a result of the capture and processing of this data.

In your answer you will be assessed on your ability to follow a line of reasoning to produce a coherent, relevant and structured response.

[12 marks]

The principles of a barcode reader is that it shines a laser over a barcode to read the gaps in between the bars. It will then convert that to binary and look it up in a database using it as an ID to find the product.

The principles of RFID is that it is a radio-frequency identification that needs the ~~input~~ mode of an emitter and a reader. The card will have a radio-readable chip on it, which when read by the card machine (the reader) it will transfer the



information using radio waves. This transfer will be encrypted. The information is the payment details of the card.

When it comes to the legal issues that might arise from collecting all that data is a clause from the Data Protection Act 2018 which states that you cannot "store excessive amounts of data on one person". Going by the description of what they plan to store, it could be argued that it is too much information and hence in violation of the ~~Data Act~~ Data Protection Act.

Another legal issue that might arise is the storage of this data. According to the Data Protection Act, "Data must be kept securely". This would require at least encryption for the data to be digitally safe, but would be up to the company ~~to~~ ^{and} how to physically store it. If it was found out that this data was not kept securely, they could be fined amounts up to