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**Started on** Monday, 23 May 2022, 3:00 PM

**State** Finished

**Completed on** Monday, 23 May 2022, 3:49 PM

**Time taken** 49 mins 44 secs

**Marks** 84.00/96.00

**Grade** 87.50 out of 100.00

### Question 1

Correct

Mark 2.00 out of 2.00

A data **D** that consists of bit-stream **1100010100** is sent out using **CRC** error detection with generator **G = 1010**. Determine the value of **R** that is sent out together with the data **D**!

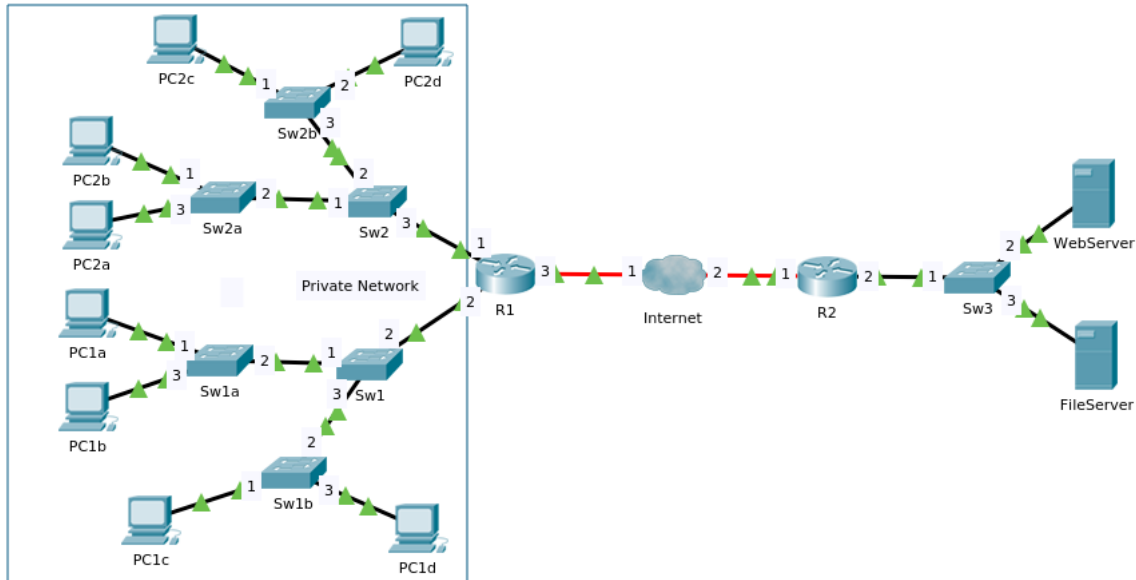
Answer: 110



The correct answer is: 110

## Question 2

Partially correct Mark 82.00 out of 94.00



Consider the network above. Please **NOTE** that the network inside blue rectangle is a **private network** (i.e. private IP addresses are used by its hosts) and **R1** is a **NAT enabled** router. Suppose that, initially the **ARP table** in all hosts and routers are **empty**, and all **Switch tables** are **empty** too. Then, the following transmissions happen in chronological order:

1. PC1c sends a ping command to PC1a
2. PC1d sends a ping command to PC2d
3. PC2a accesses a web page from WebServer

After the last packet transmission, please fill in the **ARP** tables in each host and router, as well as the **Switch** tables, by completing the tables below:

**NOTE:**

- Router is written with the interface number separated by '-'. E.g. R1-1, R1-2, R2-2, Internet-2, etc
- Fill in the IP and MAC with the host name or router's interface number, e.g. PC1a, PC2d, R1-3, Internet-1, WebServer, etc
- Write the device name exactly as it is written in the figure.
- If there are more than one record in an **ARP** or a **Switch table**, fill the table based on the **chronological order**.
- In case of no record in table, simply fill the table with '-' (a dash sign).

### ARP Tables

PC1a		PC1b		PC1c		PC1d		PC2a		PC2b		PC2c		PC2d	
IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC
PC1c	PC1c	-	-	PC1a	PC1a	R1-2	R1-2	R1-1	R1-1	-	-	-	-	R1-1	R1-1
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

WebServer		FileServer		R1-1		R1-2		R1-3		R2-1		R2-2	
IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC	IP	MAC
R2-2	R2-2	-	-	PC2a	PC2a	R1-2	R1-2	Internet-1	Internet-1	Internet-2	Internet-2	WebServer	WebServer
✓	✓	✓	✓	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓
				PC2d	PC2d								
				✗	✗								

### Switch tables

Sw1		Sw1a		Sw1b		Sw2		Sw2a		Sw2b		Sw3	
MAC	Port	MAC	Port	MAC	Port	MAC	Port	MAC	Port	MAC	Port	MAC	Port
PC1c	3	PC1c	2	PC1c	1	R1-2	3	PC2a	3	R1-2	3	R2-2	1
✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓
PC1a	1	PC1a	1	PC1a	2	PC2d	2	R1-1	2	PC2d	2	WebServer	2
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PC1d	3			PC1d	3	PC2a	1						
✓	✓			✓	✓	✓	✓						
R1-1	2			R1-2	2								
✗	✓			✓	✓								

When PC2a accesses a web page from WebServer, an HTTP request message is sent from PC2a to WebServer, and an HTTP response in the opposite direction. Please complete the information about **source** and **destination** of **IP Address** and **MAC Address**, during this communication process at various locations:

Location	Source MAC	Destination MAC	Source IP	Destination IP
PC2a --> R1	PC2a ✓	R1-1 ✓	PC2a ✓	WebServer ✓
R1 --> Internet	R1-3 ✓	Internet-1 ✓	R1-3 ✓	WebServer ✓
R2 --> WebServer	R2-2 ✓	WebServer ✓	R1-3 ✓	WebServer ✓
WebServer --> R2	WebServer ✓	R2-2 ✓	WebServer ✓	R1-3 ✓
Internet --> R1	Internet-1 ✓	R1-3 ✓	WebServer ✓	R1-3 ✓
R1 --> PC2a	R1-2 ✗	PC1d ✗	WebServer ✓	PC1d ✗