

Initial Table

index 0 10

0	0	0	0	0	5	0	0	0	0	0
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Table size = 11

$$\text{hash}_1(x) = x \% \text{table size}$$

$$\text{hash}_2(x) = 5 - (x \% 5)$$

$$\therefore h_i(x) = (\text{hash}_1(x) + i \cdot \text{hash}_2(x)) \% 11$$

Add 16

$$h_0(16) = 16 \% 11$$

$$= 5 \text{ collision!}$$

$$h_1(16) = (5 + (5 - (16 \% 5))) \% 11$$

$$= (5 + 4) \% 11$$

$$= 9 \text{ Valid!}$$

0 10

0	0	0	0	0	5	0	0	0	16	0
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Add 27

$$h_0(27) = 27 \% 11$$

$$= 5 \text{ collision!}$$

$$h_1(27) = (5 + (5 - (27 \% 5))) \% 11$$

$$= (5 + (3)) \% 11$$

$$= 8 \% 11$$

$$= 8 \text{ Valid!}$$

0 10

0	0	0	0	0	5	0	0	27	16	0
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Add 9

$$h_0(9) = 9 \% 11$$

$$= 9 \text{ collision!}$$

$$h_1(9) = (9 + (5 - (9 \% 5))) \% 11$$

$$= 10 \% 11$$

$$= 10 \text{ Valid!}$$

0 10

0	0	0	0	0	5	0	0	27	16	9
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Delete 16

0 10

0	0	0	0	0	5	0	0	27	D	9
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Add 20

$$h_0(20) = 20 \% 11$$

$$= 9 \text{ Valid!}$$

0 10

0	0	0	0	0	5	0	0	27	20	9
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Add 16

$$h_0(16) = 16 \% 11$$

$$= 5 \text{ collision!}$$

$$h_1(16) = (5 + (5 - (16 \% 5))) \% 11$$

$$= (5 + 4) \% 11$$

$$= 9 \text{ collision!}$$

$$h_2(16) = (5 + 2 \cdot (5 - (16 \% 5))) \% 11$$

$$= 2 \text{ Valid!}$$

0 10

0	0	0	20	0	5	0	0	27	16	9
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0	0	16	0	0	5	0	0	27	20	9
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2 Ans