Insert keys ie 76,26,37,5,9,21,65,85 into hash table of size m=11 using linear probing with primary function

h’(k)=k mod m.

Soln,

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | N | N | N | N | N | N | N |

Now using linear probing we have,

h(k,i) = ((h’(k)+i)mod m)

h(k,i) = (((k mod m)+i)mod m)

for key 76

h(76,0) = (((76 mod 11)+0)mod 11)

= 10

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | N | N | N | N | N | N | 76 |

For key 26

h(26,0) = (((26 mod 11)+0)mod 11)

= 4

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | N | N | N | N | N | 76 |

For key 37

h(37,0) = (((37 mod 11)+0)mod 11)

= 4

space is already occupied so,

h(37,1) = (((37 mod 11)+1)mod 11)

= 5

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | 37 | N | N | N | N | 76 |

For key 5

h(5,0) = (((5 mod 11)+0)mod 11)

= 5

space is already occupied so,

h(5,1) = (((5 mod 11)+1)mod 11)

= 6

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | 37 | 5 | N | N | N | 76 |

For key 9

h(9,0) = (((9 mod 11)+0)mod 11)

= 9

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | 37 | 5 | N | N | 9 | 76 |

For key 21

h(21,0) = (((21 mod 11)+0)mod 11)

= 10

space is already occupied so,

h(21,1) = (((21 mod 11)+1)mod 11)

= 0

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | N | N | N | 26 | 37 | 5 | N | N | 9 | 76 |

For key 65

h(65,0) = (((65 mod 11)+0)mod 11)

= 10

space is already occupied so,

h(65,1) = (((65 mod 11)+1)mod 11)

= 0

space is already occupied so,

h(65,2) = (((65 mod 11)+2)mod 11)

= 1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | 65 | N | N | 26 | 37 | 5 | N | N | 9 | 76 |

For key 85

h(85,0) = (((85 mod 11)+0)mod 11)

= 8

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | 65 | N | N | 26 | 37 | 5 | N | 85 | 9 | 76 |

Insert keys ie 76,26,37,5,9,21,65,85 into hash table of size m=11 using quadratic probing with primary function

h’(k)=k mod m c1=1 and c2=3.

Soln,

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | N | N | N | N | N | N | N |

h(k,i)=((h(k)+c1xi+c2xi^2)mod m)

=((k mod m)+i+3i2)mod m

for key 76

h(76,0)= ((76 mod 11)+0+3x02)mod 11

= 10

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | N | N | N | N | N | N | 76 |

For key 26

h(26,0)= ((26 mod 11)+0+3x02)mod 11

= 4

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | N | N | N | N | N | 76 |

For key 37

h(37,0)= ((37 mod 11)+0+3x02)mod 11

= 4

space is occupied so,

h(37,1)= ((37 mod 11)+1+3x12)mod 11

= 8

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | N | N | N | 37 | N | 76 |

For key 5

h(5,0)= ((5 mod 11)+0+3x02)mod 11

= 5

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | 5 | N | N | 37 | N | 76 |

For key 9

h(9,0)= ((9 mod 11)+0+3x02)mod 11

= 9

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | N | 26 | 5 | N | N | 37 | 9 | 76 |

For key 21

h(21,0)= ((21 mod 11)+0+3x02)mod 11

= 10

space is occupied so,

h(21,1)= ((21 mod 11)+1+3x12)mod 11

= 3

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | N | 21 | 26 | 5 | N | N | 37 | 9 | 76 |

For key 65

h(65,0)= ((65 mod 11)+0+3x02)mod 11

= 10

space is occupied so,

h(65,1)= ((65 mod 11)+1+3x12)mod 11

= 3

space is occupied so,

h(65,2)= ((65 mod 11)+2+3x22)mod 11

= 2

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | N | 65 | 21 | 26 | 5 | N | N | 37 | 9 | 76 |

For key 85

h(85,0)= ((85 mod 11)+0+3x02)mod 11

= 8

space is occupied so,

h(85,1)= ((85 mod 11)+1+3x12)mod 11

= 1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | 85 | 65 | 21 | 26 | 5 | N | N | 37 | 9 | 76 |