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| COMP4500 Assignment 1 |
| Andrew Whalley - 42588610 |
|  |
|  |
| **9/14/2014** |

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Part A

# Question 1. a)

Student number with prefix and postfix: 924258861052

SNI After algorithm: 924258161052

# Question 1. b)

# Question 2. a)

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | White |  |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | White |  |
| 2 | Grey | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | White |  |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | White |  |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | White |  |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | White |  |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | White |  |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | Grey | 1 |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | White |  |
| 5 | Grey | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | Grey | 8 |
| 5 | Grey | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | Black | 8 |
| 5 | Grey | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Grey | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | Black | 8 |
| 5 | Grey | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Black | 5 |
| 9 | White |  |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Black | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | White |  |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Black | 5 |
| 9 | White |  |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | Grey | Undefined |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Black | 5 |
| 9 | White |  |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | White |  |
| 8 | Black | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | Grey | Undefined |
| 8 | Black | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Black | 5 |
| 9 | White |  |

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| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Black | 5 |
| 9 | Grey | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 8 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 8 |
| 5 | Black | 0 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Black | 5 |
| 9 | Black | Undefined |

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# Question 2. b)

# Question 2. c)

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | White |  |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | Grey | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | White |  |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | Grey | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | White |  |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | Grey | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | White |  |
| 1 | White |  |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | White |  |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | White |  |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | Grey | 1 |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | White |  |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | White |  |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | White |  |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | Grey | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | Grey | 5 |
| 3 | Black | Undefined |
| 4 | White |  |
| 5 | Grey | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | Grey | 5 |
| 3 | Black | Undefined |
| 4 | Grey | 2 |
| 5 | Grey | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | Grey | 5 |
| 3 | Black | Undefined |
| 4 | Black | 2 |
| 5 | Grey | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 2 |
| 5 | Grey | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 2 |
| 5 | Black | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Grey | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Grey | 0 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 2 |
| 5 | Black | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Black | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Grey | Undefined |
| 1 | Black | 0 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 2 |
| 5 | Black | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Black | 1 |
| 9 | Black | Undefined |

|  |  |  |
| --- | --- | --- |
| X | Colour[x] | Parent[x] |
| 0 | Black | Undefined |
| 1 | Black | 0 |
| 2 | Black | 5 |
| 3 | Black | Undefined |
| 4 | Black | 2 |
| 5 | Black | 8 |
| 6 | Black | 1 |
| 7 | Black | Undefined |
| 8 | Black | 1 |
| 9 | Black | Undefined |