🡺 Your name: **Navid Vadsariya** Student No.: **136884186** UserID: **nnvadsariya@mySeneca.ca**

**Activity 1** of 3 – **integer overflow**

🡺 If a counter is incremented every hundredth of a second, exactly how many **days** (to two decimals) could be counted in a signed 32-bit integer, i.e. a **long**, until just before it overflowed? **(5 points)**

**2,147,483,647/(100\*60\*60\*24)=248.55**

🡺 What is potentially wrong with that line of code? How could it go wrong? **(10 points)**

**If low + high values is greater than maximum value that can be stored in an integer than overflow occurs. Eg. If low is 1000000000 and high is 2000000000 then mid should be 1500000000 but because of integer overflow it is -647483648.**

🡺 At what points would overflow occur when assigning a value to a signed 16-bit integer, that is, a **short** data type? **(5 points)   
Values greater than 32,767 will overflow a short data type (16-bit)**

🡺 REWRITE the code to prevent overflow **(10 points)  
*from* mid = (low + high) / 2;  
*to* mid = low + (high – low) / 2;**

🡺 How did you develop your REWRITE? **(20 points)**Overflow will occur when sum of low and high is greater than the maximum positive value that can be stored in an integer and after dividing by 2 the value stays negative. Subtracting low from high then dividing the results by 2 and then adding low back will give the correct results since overflow will not occur**.**

**Activity 2** of 3 – **Boolean logic (25 points)**

**🡺 For any date in a year, what is the logic to decide if you have to go to school?**

**if (DoW == Monday || DoW == Tuesday || DoW == Wednesday || DoW == Thursday || DoW == Friday || Dow != Saturday || DoW != Sunday) {**

**if(today <= 2019-05-06 || today >= 2019-08-16){**

**// today's date is not in semester's date range**

**}**

**else if(today >= 2019-06-24 && today <= 2019-06-28){**

**// study break**

**}**

**else if (today != 2019-05-20 && today != 2019-07-01 && today != 2019-08-05){**

**// today is a holiday**

**}**

**else {**

**// has class**

**}**

**}**

**else{**

**//No class its Saturday or Sunday**

**}**

**Activity 3a and 3b** of 3 – **Numbering Systems and Conversions (15 + 10 points)**

3a 🡺 What is the hex value for these colours? **(15 points)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Colour** | **Red value** | **Green value** | **Blue value** | **6 digit Hex code** |
| White | **255** | **255** | **255** | #FFFFFF |
| **Grey** | **128** | **128** | **128** | #808080 |
| **Black** | **0** | **0** | **0** | #000000 |
|  | **0** | **211** | **023** | #00d317 |
|  | 103 | 110 | 160 | #676EA0 |

3b 🡺 Fill in this chart as per the column headings **(10 points)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **6 digit Hex code** | **Red decimal value (0-255)** | **Green decimal value (0-255)** | **Blue decimal value (0-255)** | **Describe the Final Colour *and* change the cell's background colour, i.e. R-click and see MS Word 'Shading', to match the values for RGB** |
| #FB6905 | 251 | 105 | 5 | orange |
| #0AA2C8 | 10 | 162 | 200 | Cerulean blue |
| #E160B7 | 225 | 96 | 183 | pink |
| #0B6A0C | 11 | 106 | 12 | green |