

## HEXAWARE PHASE 2 - DAY 1 TRAINING ASSIGNMENT

1. A bear starting from the point P, walked one mile due south, Then he changed direction and walked one mile due east. Then he turned again to the left and walked one mile due north and arrived at point P he started from what was the colour of the bear?

### Algorithm:

Step 1: Start

Step 2: Let the bear start from point P

Step 3: Move 1 mile south

Step 4: Move 1 mile east

Step 5: Move 1 mile north

Step 6: Check if the bear reaches point P again

Step 7: If yes, then the location must be the North Pole

Step 8: At the North Pole, the only type of bear found is the polar bear

Step 9: Polar bears are white in color

Step 10: Display "**White**"

Step 11: End

2. Two towns A and B are 3 km s apart It is proposed to build a new school serving 100 students in town A and 50 students in town B. How far from town A should the school be built if the total travel distance by all 150 students is to be as small as possible?

### Algorithm:

Step 1: Start

Step 2: Input distance between Town A and Town B = 3 km

Step 3: Input number of students in Town A = 100

Step 4: Input number of students in Town B = 50

Step 5: Calculate ratio of students =  $100:50 = 2:1$

Step 6: Use inverse ratio =  $1:2$

Step 7: Divide distance in  $1:2$  ratio

Step 8: Distance from Town A =  $(1/3) \times 3 \text{ km} = 1 \text{ km}$

Step 9: Distance from Town B =  $(2/3) \times 3 \text{ km} = 2 \text{ km}$

Step 10: Display "**School should be built 1 km from Town A**"

Step 11: End

3. A traveller arrives at hotel he has no money but only a silver chain consisting of 6 links. He uses one link to pay for each day spent at the hotel but the hotel manager agrees to accept no more than one broken link. How should the traveller cut up the chain in order to settle the amount with the hotel manager on a daily basis? 1. what is the least number of links that have to be cut if the traveller stays 100 days at the hotel and has a chain consisting of 100 links? what is the answer in general case n days and n links?

**Algorithm- Minimum cuts for 6 days:**

Step 1: Start  
Step 2: Input chain with 6 links  
Step 3: Traveler needs to pay 1 link per day for 6 days  
Step 4: Hotel manager allows only one broken link  
Step 5: Divide chain using binary method  
Step 6: Cut the chain to get 1-link, 2-link, and 3-link parts  
Step 7: Use combinations of these parts to pay each day  
Step 8: Minimum cuts required = 2  
Step 9: Display "**Minimum cuts required = 2**"  
Step 10: End

**Algorithm-Minimum cuts for 100 days:**

Step 1: Start  
Step 2: Input chain with 100 links  
Step 3: Use binary breakdown (powers of 2): 1,2,4,8,16,32  
Step 4: Remaining part =  $100 - (1+2+4+8+16+32) = 37$   
Step 5: Final pieces = 1,2,4,8,16,32,37  
Step 6: Total pieces = 7, so number of cuts = 6  
Step 7: Display "**Minimum cuts required = 6**"  
Step 8: End

**Algorithm-N days and N links:**

Step 1: Start  
Step 2: Input N (number of days and links)  
Step 3: Use powers of 2 to divide chain  
Step 4: Count number of pieces =  $\text{ceil}(\log_2 N)$   
Step 5: Number of cuts = number of pieces - 1  
Step 6: Display result  
Step 7: End

4. Rearrange the letters in the words new door to make one word

**Algorithm:**

Step 1: Start

Step 2: Input Word="new door"

Step 3: Remove space → new string = "newdoor"

Step 4: Generate all permutations of "newdoor"

Step 5: Check if any permutation is a valid word

Step 6: If permutation = "one word", display "**Rearranged successfully**"

Step 7: Else, display "**No valid arrangement found**"

Step 8: End

5. Do divide and conquer 6 5 1 4 3 2

**Algorithm:**

Step 1: Start

Step 2: Input array = [6, 5, 1, 4, 3, 2]

Step 3: Divide array into two halves: [6, 5, 1] and [4, 3, 2]

Step 4: Divide each half recursively until each subarray has one element

Step 5: Sort and merge [6, 5] → [5, 6]

Step 6: Merge [5, 6] with [1] → [1, 5, 6]

Step 7: Sort and merge [4, 3] → [3, 4]

Step 8: Merge [3, 4] with [2] → [2, 3, 4]

Step 9: Final merge [1, 5, 6] and [2, 3, 4] → [1, 2, 3, 4, 5, 6]

Step 10: Display **sorted array**

Step 11: End

6. Draw flowchart for calculating simple interest

**Algorithm:**

Step 1: Start

Step 2: Input Principal (P)

Step 3: Input Rate of Interest (R)

Step 4: Input Time (T)

Step 5: Calculate  $SI = (P \times R \times T) / 100$

Step 6: Display **Simple Interest**

Step 7: End

