Assignment 1

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September 3, 2020

Figure 1: IIT-Dharwad

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1 Maths Section

1.1 Inline mathematical expression

$$C(n,r) = n!/(r!(n-r)!)$$

1.2 Non-numbered Equation

$$a = b + c/d$$

1.3 Numbered Equation

$$10 * 2 + 5 = 25$$

1.4 Multiline Equation

$$\begin{aligned} h =& \sqrt{(a+b)^2 - 4ab} \\ =& \sqrt{(a-b)^2} \\ =& |a-b| \end{aligned} \tag{1}$$

1.5 Matrices

$$\begin{bmatrix} a & b & c \\ 1 & 2 & 3 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} a & b & c \\ 1 & 2 & 3 \end{bmatrix} \tag{2}$$

1.6 Square root

$$\sqrt{a + b * c}$$

1.7 Summation

$$\sum_{i=0}^{10} i = 10 * (10+1)/2 = 55$$

1.8 Integration

$$\int_0^{\pi/2} sinx \ dx = 1$$

1.9 Nested Brackets

$$\left\{ xy \left\{ z \left\{ \frac{x_1}{y_1} \right\} \right\} \right\}$$

1.10 Fractions

$$\left\{ \frac{\left(\frac{a}{b}\right)}{c} \right\}$$

2 Font Styles

The font settings are following:

Bold-Font
Italic
`This is an example of teletype font`
This is an Example of Small Capitals

3 Colors

The color settings are following:
This text is orange
The colour of the text background is Cyan
The colour of the background page is yellow

4 Lists

This is an example of mixed lists

1. You can mix list environments as much as you like
   - But it might start to look silly
   * With different symbols
2. So do remember

   Word 1 This is the definition of the word 1.

   Word 2 This is the definition of the word 2.

5 Referencing and Crosslinking

The examples are the following:
We have seen various examples in the Maths section i.e. section 1
We have seen the Logo of IIT Dharwad, Figure 1 on the page 1
We have the multilined equation 1 on Page 3

6 Tables

We have a multicolumn and multirow table as an example in this section.

1,1	1,2	1,3	1,4
2,1	2,2	2,3	2,4
3,1	3,2	3,3	3,4
4,1	4,2	4,3	4,4

Table 1: Test-Table

7 Pseudocode of Quicksort

Algorithm 1 Quicksort

```
1: Given: Array a and it's size n.
2:
3: We start by passing array into the function along with end positions of the
   array
4:
5: Quicksort(Array a,int p,int r)      ....{p and r are initial and final positions}
   1: if i < f then
   2:    q = Partition(a, p, r)
   3:    Quicksort(a, p, q)
   4:    Quicksort(a, q + 1, r)
   5: end if
6:
7:  Partition(Array a,int p,int r)
   1: x = a[r]                                                  .....{Choosing pivot}
   2: i = p − 1
   3: j = r + 1
   4:
   5: for j = p to r − 1 do
   6:    if a[j] ≤ x then
   7:       i = i + 1
   8:       exchange a[i] with a[j]
   9:    end if
   10: end for
   11: exchange a[i + 1] with a[r]
   12: return i + 1
```

8 Bibliography

References

[1] T. H. Cormen, C. Leiserson, R. Rivest, and C. Stein, "Introduction to algorithms, 3rd edition," 2009.

[2] A. Aggarwal, "Quicksort." `https://www.cc.gatech.edu/classes/cs3158_98_fall/quicksort.html`, May 2013.

[3] A. A. R. Alsaeedy and E. K. P. Chong, "Detecting regions at risk for spreading covid-19 using existing cellular wireless network functionalities," *IEEE Open Journal of Engineering in Medicine and Biology*, vol. 1, pp. 187–189, 2020.

[4] Yi Tan and Guo-Ji Zhang, "The application of machine learning algorithm in underwriting process," in *2005 International Conference on Machine Learning and Cybernetics*, vol. 6, pp. 3523–3527 Vol. 6, 2005.

[5] Liu Xian, "Artificial intelligence and modern sports education technology," in *2010 International Conference on Artificial Intelligence and Education (ICAIE)*, pp. 772–776, 2010.

In [1], The authors have explained the quicksort pseudocode. This pseudocode was used in Algorithm 1.

In [2], The author has given the pseudocode for the quicksort which inturn helped me to gain insight into the algorithm

In [3], The Authors has researched on dectecting Regions At Risk for Spreading COVID-19 Using Existing Cellular Wireless Network Functionalities

In [4], The authors have explained about machine learning.

In [5], The author have explained about artificial intelligence.