Communications of Adhikari Academy of Learning

in

Computer Science and Information Technology

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EDITORS

News

We have published first edition of book entitled *Lecture Notes in Database Management Systems* recently. It contains material of forty lecture notes. It serves both for regular studies and competitive examinations.
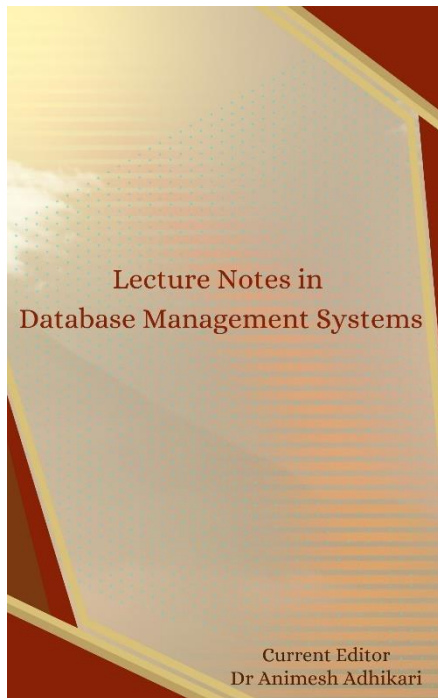
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Biography: Dr Animesh Adhikari is Founder and Editor of Adhikari Academy of Learning Private Limited, Goa, India. Animesh received Master of Technology and Ph D degrees, both in Computer Science, from Indian Statistical Institute and Goa University, respectively.
Animesh has been working in both academia and software industry since 1993. In the past, he served to K L University, Guntur; Chowgule College, Margao; and Price water house Associates, Kolkata.
Animesh published three research monographs on *Data and Knowledge Engineering* with Springer, Germany, and twenty research papers in international journals and international conferences. He published twenty-seven books on various aspects of Computer Science and Information Technology with Adhikari Academy of Learning, Goa. Animesh also published a few derived books such as Mathematics for Computer Science and Information Technology, and GATE

Data have become available everywhere, and computers process data. Database management systems play important role in handling a large volume of data effectively. This topic remains at the heart of Computer Science and Information Technology. For this reason, this topic is included in most of the science and engineering programs across the globe. In this book, there are forty lecture materials explaining the main concepts of database management systems.

For more details, please visit us: www.adhikariacademy.com
Books → Software Systems → Lecture Notes in Database Management Systems

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1. Write differences between block, block pattern and layout as given in WordPress. How do you create block pattern(s) in a page or post?

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Answer: *Blocks* are the smallest and atomic units in the WordPress editor. Paragraph is the default block. Some blocks, like an image, are static. But there are dynamic blocks like a list of posts.
Block patterns are curated collections of blocks, often organized around a specific section or purpose. An example of a block pattern is a Contact pattern which is a block containing information such as address, phone number, and email address. At the end of block, there will be Submit button that helps in collecting information by the server.

Another example of block pattern is a Team pattern. It may contain the following information:

- A series of column blocks

- For each column block, there is a group of blocks.

- Each column (group of blocks) represents a team member, containing the following blocks of information:

  - An image block with a round mask for headshot

  - A header block for names

  - A paragraph block for biography

  - A block containing social links

Layouts are still bigger design blocks, and one step up from patterns. Layouts can be groupings of patterns or specific blocks that make up the entire design of page including header, footer, and any additional global or repeating block areas, like sidebars.

We assume that we have a site in `WordPress.com`, and the site is built using free features offered by `WordPress.com`. We enter in our `WordPress.com` account using the following web address as provided: www.animeshadhikari44deae24f1.wordpress.com

Block patterns are collection of predefined blocks that one can insert into posts and pages.

We shall explore now how to get a pattern for a page to be created.

Once you enter in the account, follow the path:

`My Home → Pages → Add New Page`

Suppose that we wish to create a page on GATE- CS & IT book as available in www.adhikariacademy.com.

As we create a page for this book, we shall apply a suitable pattern that is available in the library. But, in this case, we simply select a blank page. Add title as "GATE – Computer Science and Information Technology". After adding title, we move to the editing area. We get a screen as given in Fig.1.
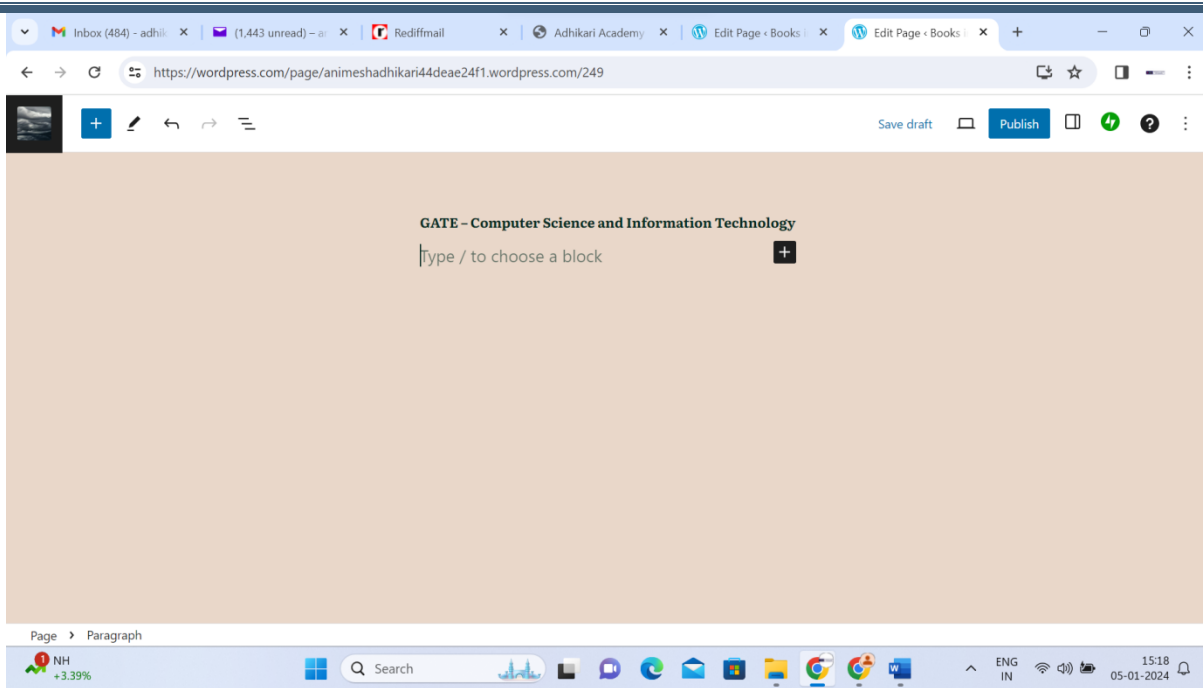
Figure 1: A screen before choosing block pattern

Now click + button at top-left corner. Then click on "Patterns". Patterns are classified into different groups. We have selected a block pattern under category "Services" having product image and description. Now, we modify it to meet our requirements. See the page now in Fig. 2.
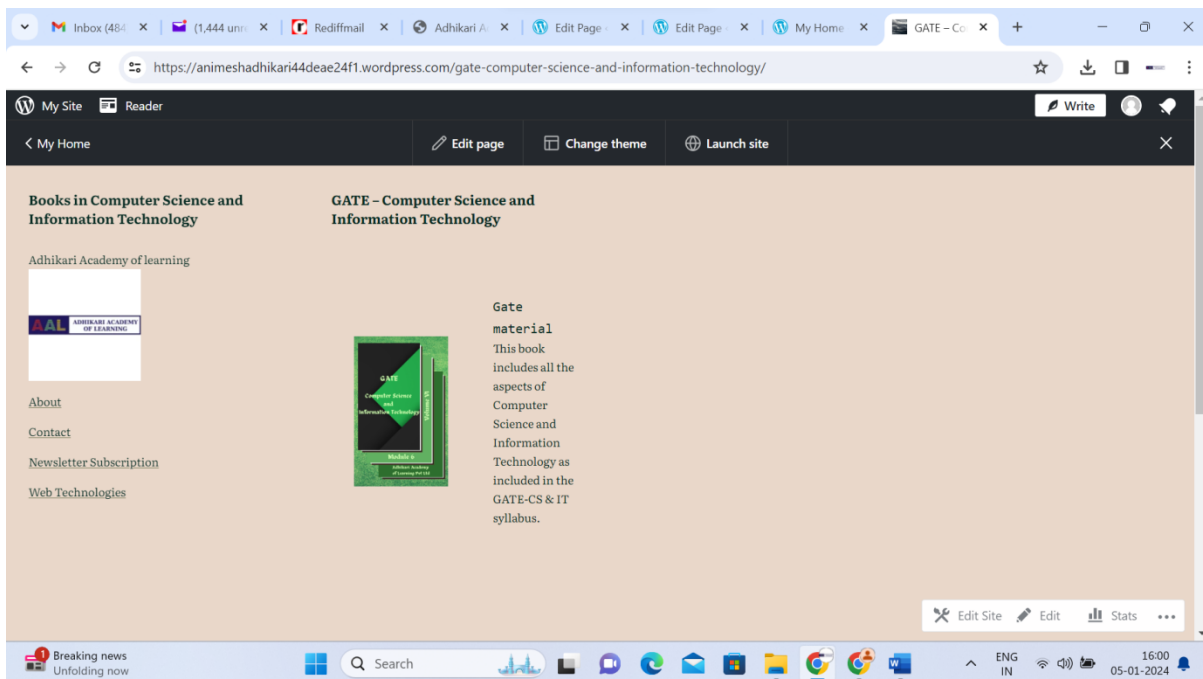

Figure 2: Page for book entitled GATE – CS & IT

Now we add the page in the home page. This is done by adding a paragraph block in the menu bar. Add the paragraph as "GATE – CS&IT", and link it to the page as created above. This block now becomes the last block in the menu bar, since it is created at the last. There

is a provision to shift the block to place it at the appropriate position, so that all menu items become alphabetically sorted. See the home page in Fig. 12.3.
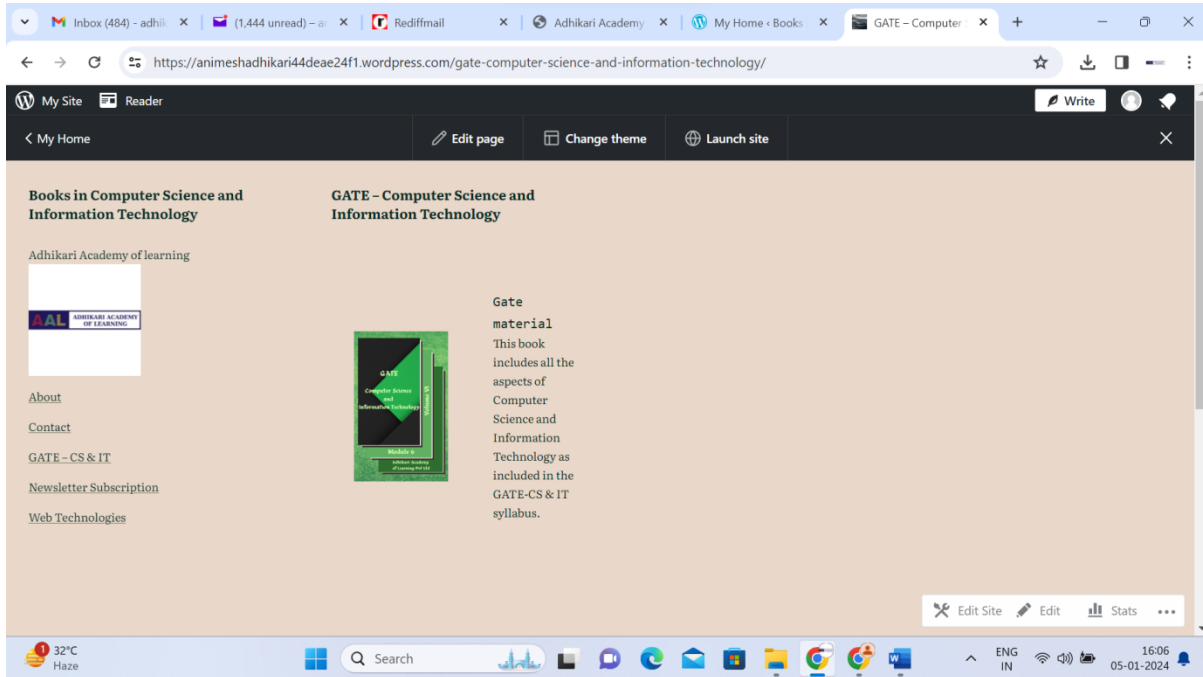

Figure 12.3: Revised home page after clicking on "GATE – CS&IT"menu as available in the menu bar

Homepage is now revised. A new item named "GATE – CS&IT" is now added. One can follow the link for choosing a block pattern that is available free with `WordPress.com`.

https://www.youtube.com/watch?v=-Lhn_IZX1SI&list=PL6nDc7ACvovLwH8kNrcVh_-hyx6z94j54&index=11

2. Find the tangent to the curve $y = \log_e(x^2)$ that is parallel to the straight line $y = x$.

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Answer: $y = \log_e(x^2) = 2\log_e(x) \Rightarrow y' = 2/x$.

Now, line $y = x$ has slope 1. Then the tangent will also have slope 1.

Thus, $2/x = 1 \Rightarrow x = 2$.

We put $x = 2$ in the given curve, and $y = \log_e(2^2) = 2\log_e 2$

Equation of tangent is $y - 2\log_e 2 = 1(x - 2)$, i.e., $y = x + 2\log_e 2 - 2$

3. Consider the following assembly language code.

```
        START 100
        READ B
        MOVER AREG, B
        . . .
L1      SUB AREG, = '1'
        BC GT, L1
        STOP
B       DS 1
```

```
LTORG
```

Construct intermediate code.

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Answer: Let the mnemonic field be of a pair of the form (statement class, code), where statement class = imperative statement (IS), or assembler directive (AD), or declarative statement (DL).

Register AREG to DREG is represented by 1 to 4 respectively.

Condition code LT to ANY is represented by 1 to 6 respectively.

An intermediate code for the above program is given below.

```
(AD, 01)(C, 100)
(IS, 05)(S, 01)
(IS, 07)(1)(S, 01)
. . .
(IS, 06)(1)(L, 01)
(IS, 09)(04)(S, 02)
(IS, 10)
(DL, 02)(C, 1)
(DL, 06)
. . .
```

The second operand which is a memory operand, is expressed as follows: (operand class, code) where operand class is a constant (C) or a symbol (S) or a literal (L).

LTORG is used to begin the literal pool.

4. What is software crisis? What are the manifestations of this crisis?

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Answer: Software crisis is a term used in the early days of computing science for the difficulty of writing useful and efficient computer programs in the required time. The software crisis was due to the rapid increases in computer power and the complexity of the problems that could not be tackled. With the increase in the complexity of the software, many software problems arose because existing methods were insufficient (`Ref Wikipedia`).

The causes of the software crisis may lead to several undesirable situations such as projects running over-budget, projects running over-time, software was very inefficient, software was of low quality, software often did not meet requirements, projects were unmanageable and code difficult to maintain, and software was never delivered.

5. Write the differences between the following pieces of codes.

$a = a + b$; $a = a + b + +$;

$b + +$;

(1)   (2)

Communicated by Jhimli Adhikari

Answer: The second way is often more efficient, since the compiler may be able to avoid using redundant local and store instructions for accessing the variable b. That is, the variable b need not have to be loaded into register twice – once to add it to a and once to increment it.

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