COMPUTER SKILLS

College of Science and Engineering
Department of Computer Science

LECTURE 3

Bahast A.

INSTRUCTOR CONTACT DETAILS

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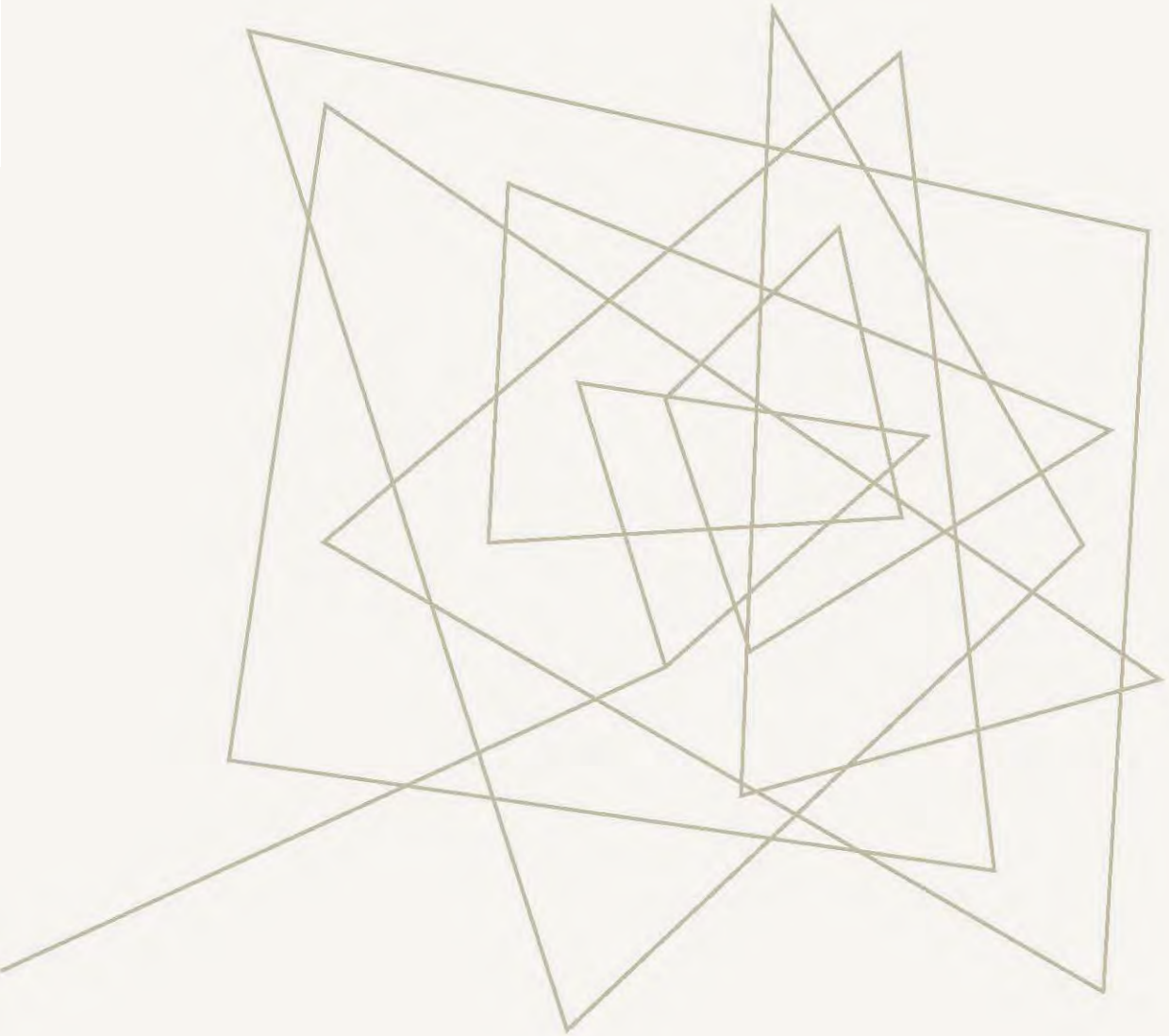
Google Classroom



LECTURE 2 RECAP

TODAY

- Encoding & Decoding
- Hexadecimal & Octals
- Word Processing
- ~~Scientific Paper~~

LEARNING OUTCOMES

By the end of this lesson, you should be able to:

Define character encoding and decoding, explaining how computers translate human symbols into numerical data for storage and processing.

Evaluate & **Compare** different encoding standards, such as ASCII and UTF-8, identifying their limitations and advantages in supporting global.

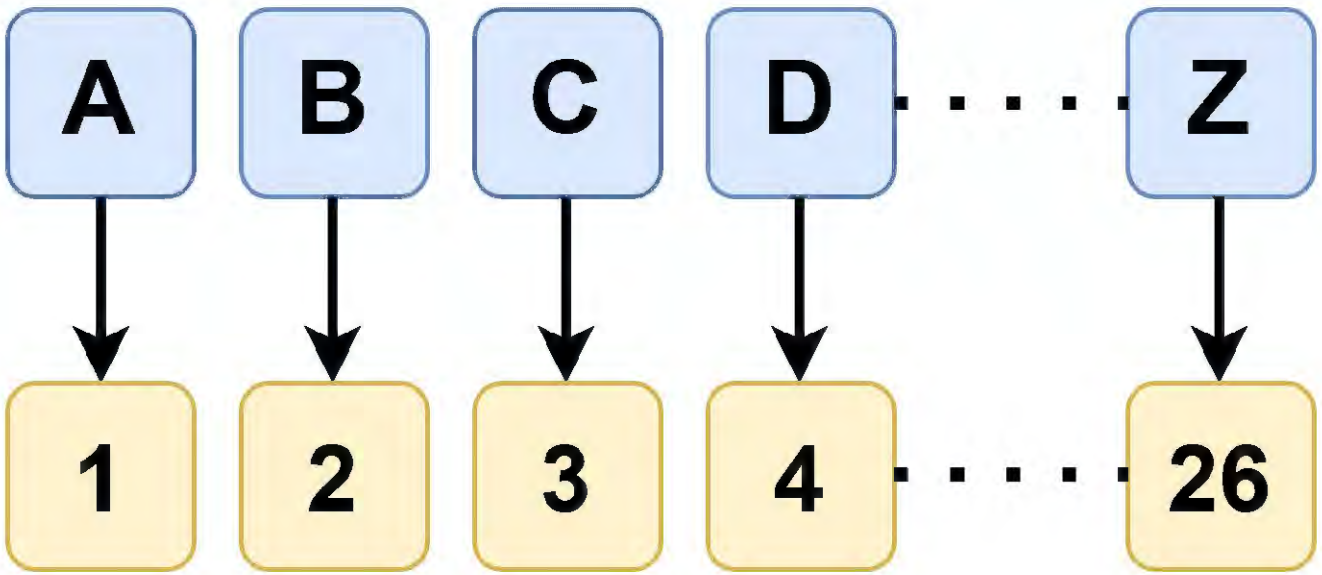
Identify & **Utilise** non-decimal number systems, including Hexadecimal (base-16) and Octal (base-8), to represent binary data in more human-readable formats.

Navigate the MS Word UI, including the Ribbon, Quick Access Toolbar, and Status Bar, to efficiently access essential commands & document information.

Apply advanced word processing techniques by using various Ribbon tabs (Home, Insert) to format text, insert objects like tables, and manage document structure.

ENCODING

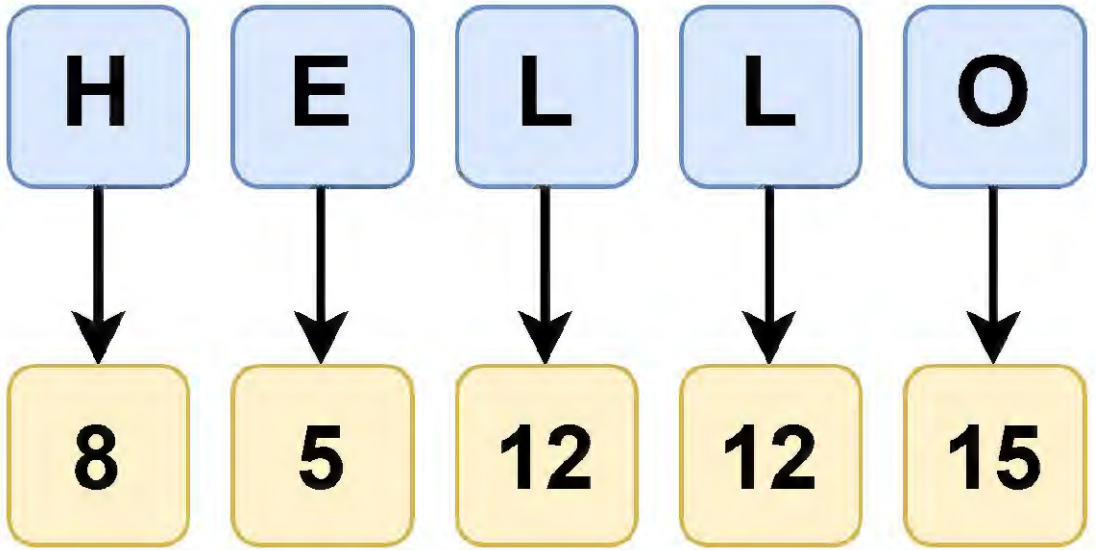
A way to turn letters & symbols into numbers so computers can store and understand them.



ENCODING CONT.

Without character encoding, text would appear as random symbols instead of readable language.

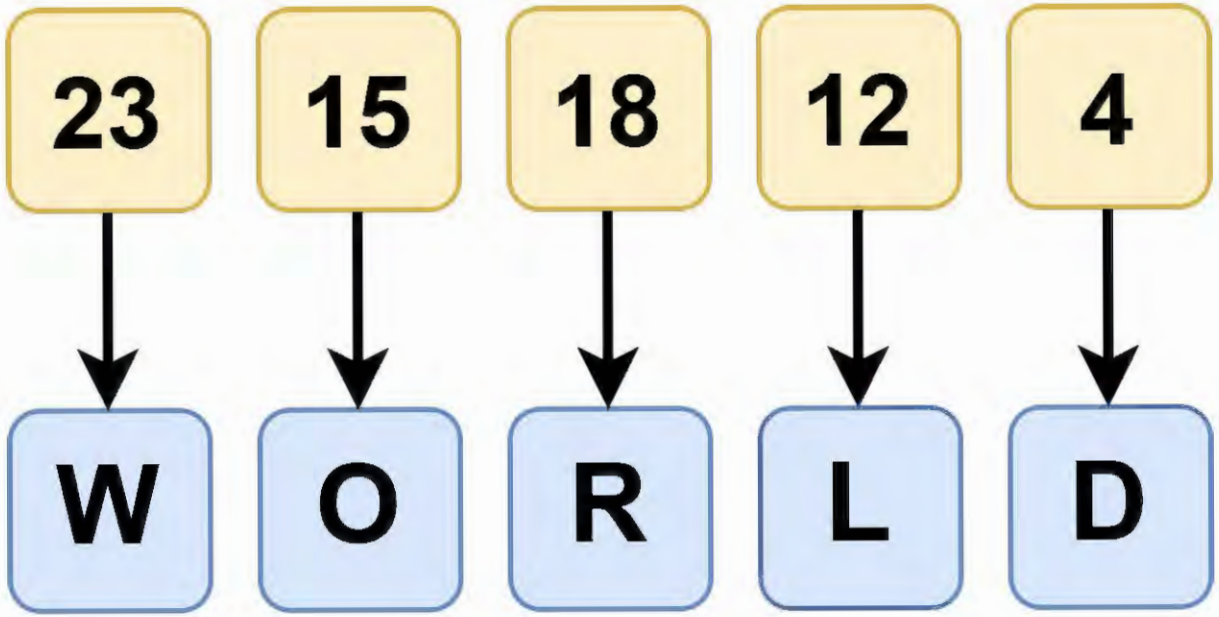
So HELLO would be 08 05 12 12 15



DECODING

Character decoding is simply turning numbers back into readable letters & symbols.

So 23 15 18 12 04 would be WORLD



CLASS ACTIVITY

Using the system we just made. Encode and decoding the following messages.

Encode:
I like learning languages

Decode:
23 05 12 12 04 15 14 05 25 15 21 08 01 22 05 03 15 13 16 12 05 20 05 04 20 08 05 20 01 19 11

SIMPLE ENCODING & DECODING

The problem here is that we do not know where a word starts or ends, where sentences start end.
We do not have capitals or small letters, nor punctuation characters.
The example only supports English language.

ASCII

7-bit character encoding standard. How many possible values?

Decimal	Binary	Octal	Hex	ASCII	Decimal	Binary	Octal	Hex	ASCII
64	01000000	100	40	@	96	01100000	140	60	`
65	01000001	101	41	A	97	01100001	141	61	a
66	01000010	102	42	B	98	01100010	142	62	b
67	01000011	103	43	C	99	01100011	143	63	c
68	01000100	104	44	D	100	01100100	144	64	d
69	01000101	105	45	E	101	01100101	145	65	e
70	01000110	106	46	F	102	01100110	146	66	f
71	01000111	107	47	G	103	01100111	147	67	g
72	01001000	110	48	H	104	01101000	150	68	h
73	01001001	111	49	I	105	01101001	151	69	i
74	01001010	112	4A	J	106	01101010	152	6A	j
75	01001011	113	4B	K	107	01101011	153	6B	k
76	01001100	114	4C	L	108	01101100	154	6C	l
77	01001101	115	4D	M	109	01101101	155	6D	m
78	01001110	116	4E	N	110	01101110	156	6E	n
79	01001111	117	4F	O	111	01101111	157	6F	o
80	01010000	120	50	P	112	01110000	160	70	p
81	01010001	121	51	Q	113	01110001	161	71	q
82	01010010	122	52	R	114	01110010	162	72	r
83	01010011	123	53	S	115	01110011	163	73	s
84	01010100	124	54	T	116	01110100	164	74	t
85	01010101	125	55	U	117	01110101	165	75	u

Includes letters small and capitals, numbers, special characters.

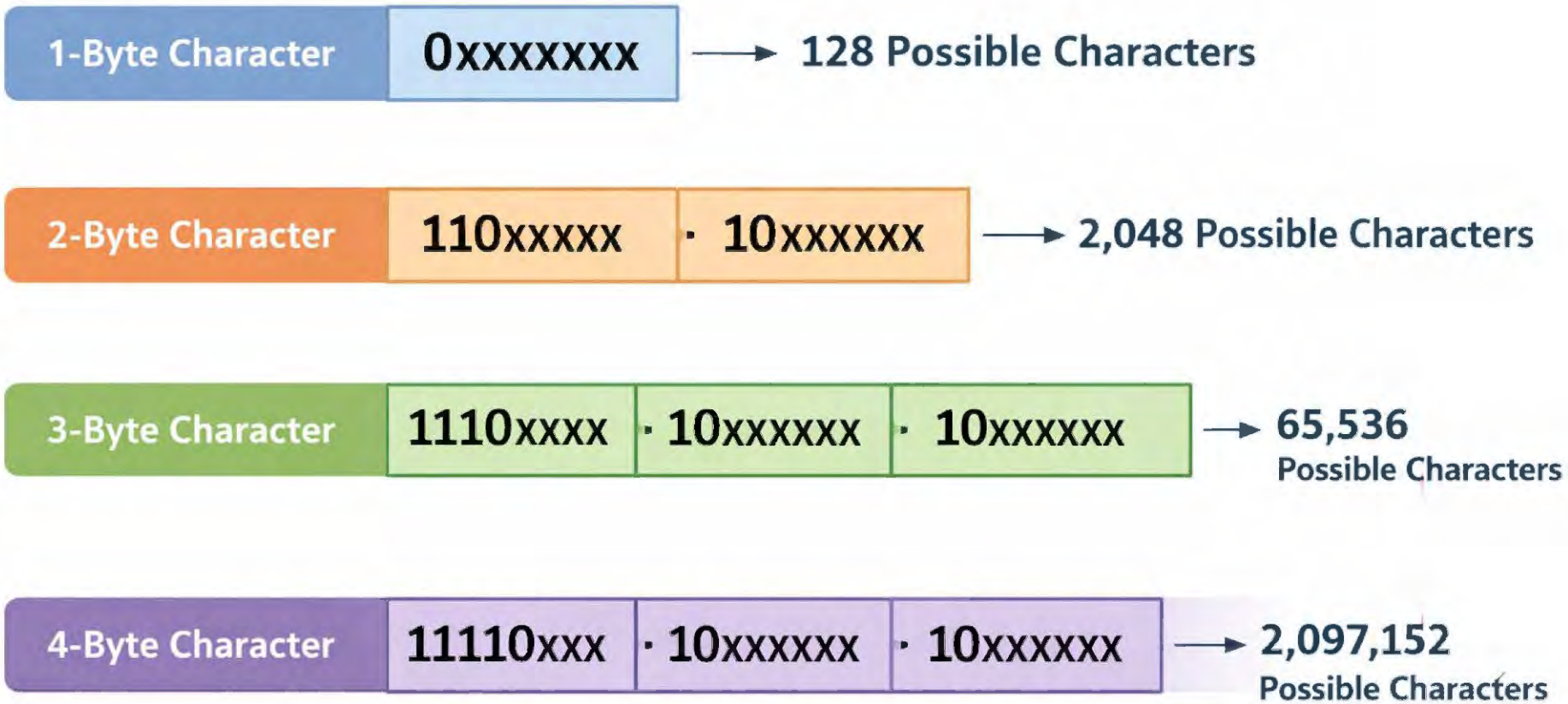
The limitation is that is does not support foreign languages, e.g. AR, KU, JP, CN, HN, etc.

UTF-8

Unicode Transformation Format standard. Can store characters in multiple bytes ‘variable-width-encoding’. From 1 to 4 bytes.

- Supports almost all languages.
- Backward compatibility with ASCII
- Used world-wide
- Supports Emoji
- Saves space – for common characters

UTF-8 CONT.


1-Byte Character
0xxxxxxx
128 Possible Characters
2-Byte Character
110xxxxx
10xxxxxx
2,048 Possible Characters
3-Byte Character
1110xxxx
10xxxxxx
10xxxxxx
65,536
Possible Characters
4-Byte Character
11110xxx
10xxxxxx
10xxxxxx
2,097,152
Possible Characters

HEXADECIMAL

Hex is a number system that uses 16 symbols instead of 2 or 10. Computers use binary (0s & 1s), which is hard to read. Hex is a shorter, human-friendly way to read & write binary.

0 1 2 3 4 5 6 7 8 9 A B C D E F

- For Screens i.e. RGB
- Memory address
- Character encoding
- Debugging & programming

HEXADECIMAL CONT.

How many bits is one hex digit?
Convert the decimal number 15 into hexadecimal?

If a colour in hex is **#FF0000**, which colour is it?
If a colour in hex is **#00FF00**, which colour is it?
If a colour in hex is **#0000FF**, which colour is it?

Hexadecimal is easier for humans to read & write thank binary.

OCTALS

Octal is a number system with base 8.It uses 8 symbols:

0 1 2 3 4 5 6 7

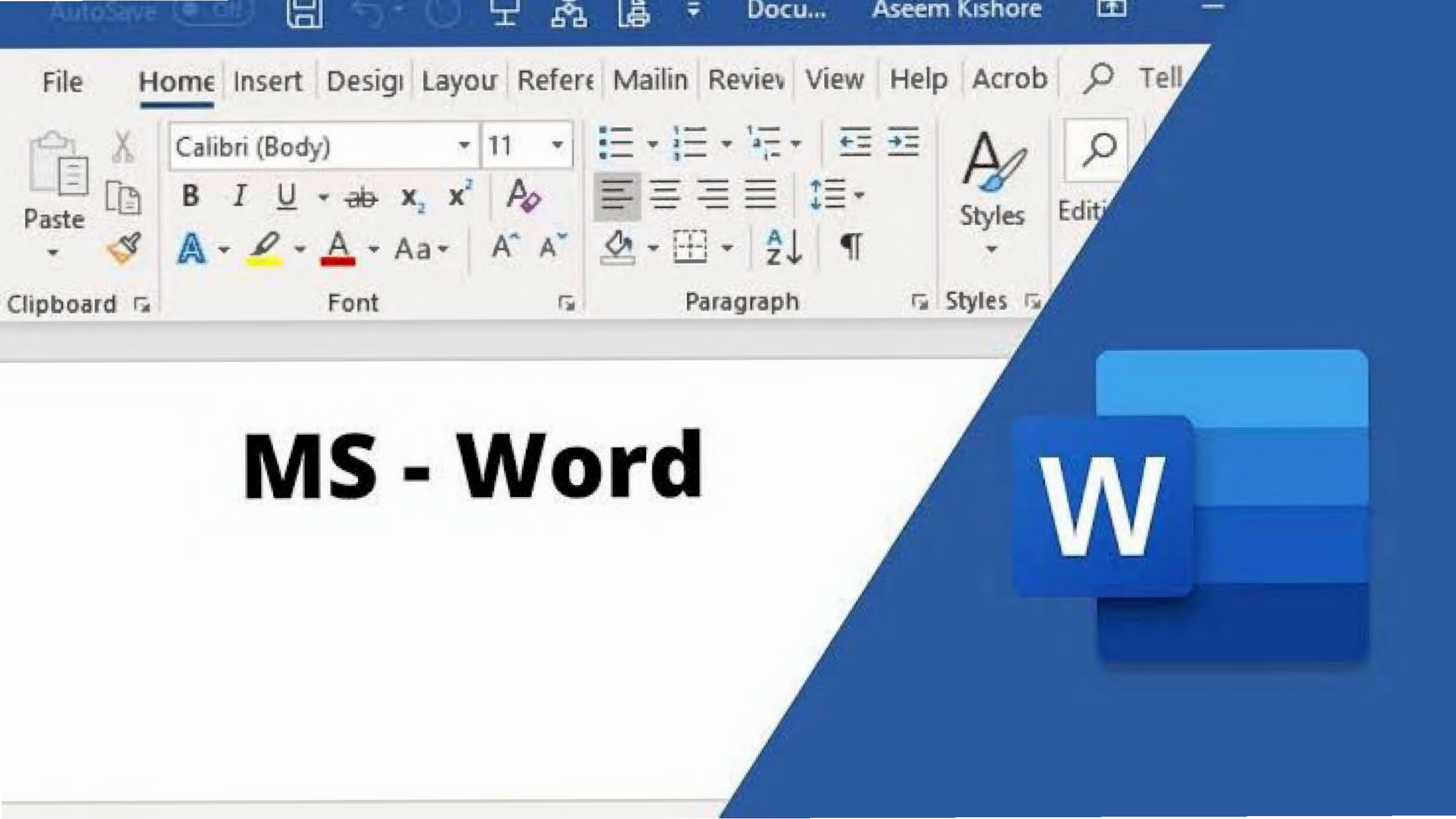
So each digit is 2^3

Shorter & easier to read than binary. Good for low-level programming & older computer systems.

WORD PROCESSING

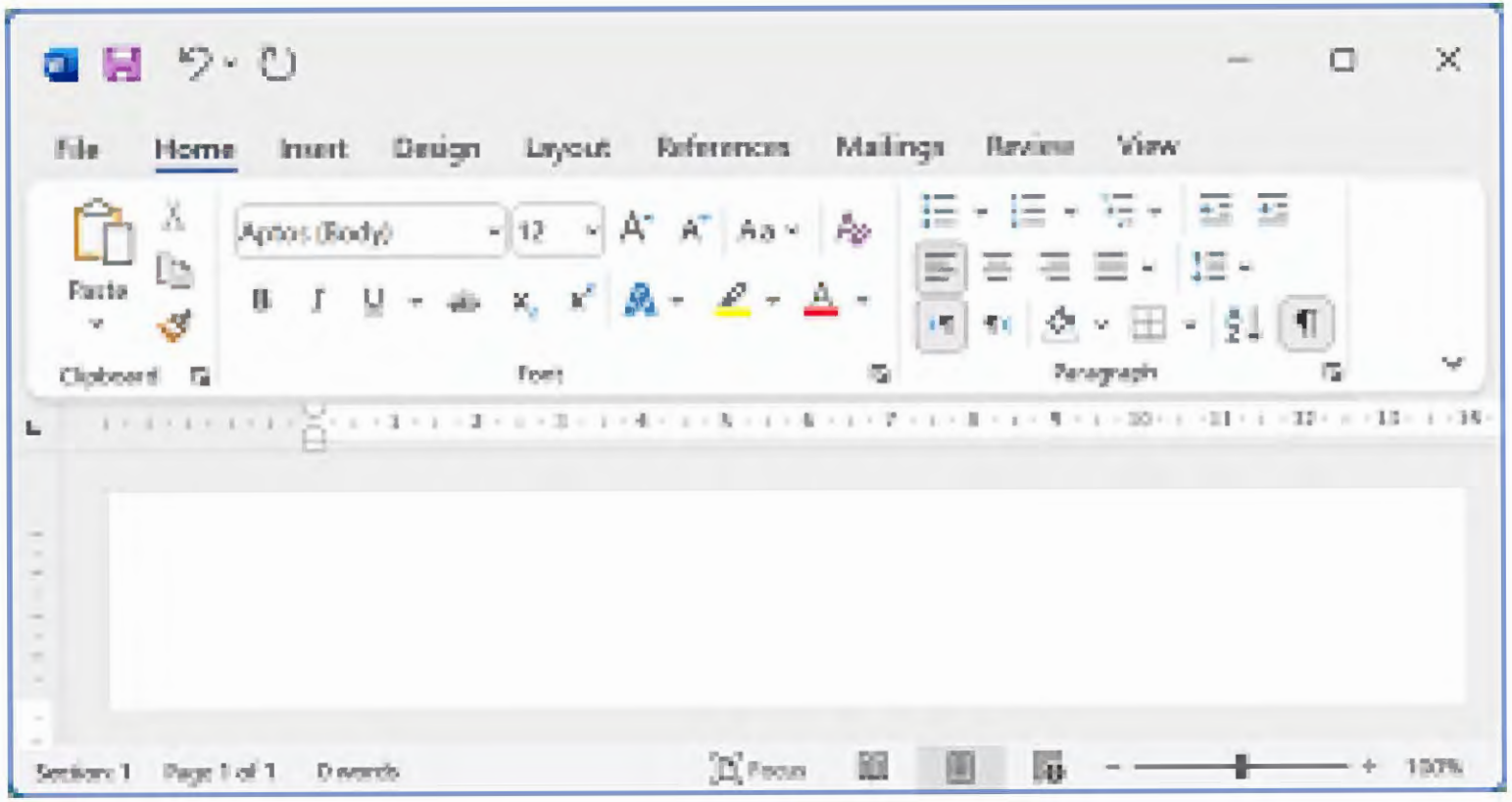
The production of typewritten documents (such as business letters & or scientific papers) with automated & usually computerised typing & text-editing equipment.

Examples: MS Word, Google Docs, Apple Pages,


Docu...
Aseem Kishore
File
Home
Insert
Desig
Layou
Refere
Mailin
Revie
View
Help
Acrob
Tell
Paste
Calibri (Body)
11
Styles
Clipboard
Font
Paragraph
Styles
MS - Word

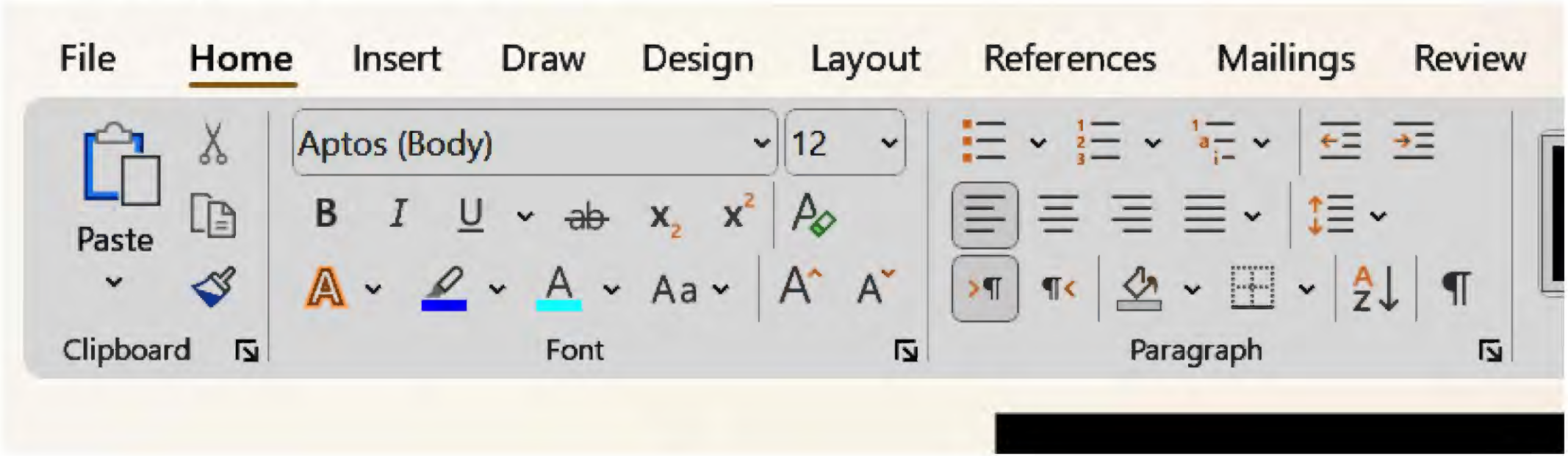
UI

- Quick Access Toolbar (QAT)
- Ribbon
- Status bar



RIBBON STRUCTURE

Tabs (Home, Insert, Draw, etc.)
Groups (Clipboard, Font, Paragraph, etc.)
Commands (Bold, Italic, Underline, etc.)
Dialog Box



RIBBON STRUCTURE

Tab	Primary Purpose	Key Tools
File	Background work	Save, Print, Share, and Options
Home	Essentials	Font, Paragraph alignment, and Styles
Insert	Adding "objects"	Tables, Pictures, Page Numbers, & Page Breaks
Design	Document-wide look	Themes, Colours, and Watermarks
Layout	Page setup	Margins, Orientation, and Section Breaks
References	Formal documents	Table of Contents, Citations, and Footnotes
Review	Collaboration	Spell Check, Track Changes, and Comments
View	Personal preference	Zoom, Ruler, and Navigation Pane

CONTEXTUAL TABS

Some tabs are invisible until they are needed.

Example: If you click on a Table, a "Table Design" and "Layout" tab will appear in a different colour (usually green or blue).

Example: If you click on an Image, a "Picture Format" tab appears.

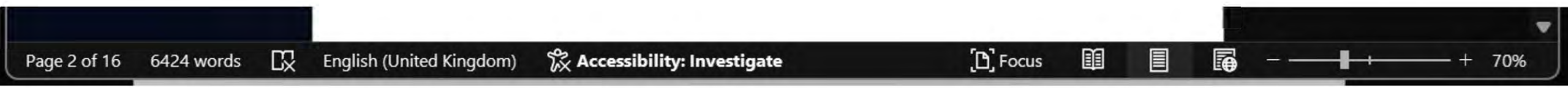
STATUS BAR

Page Number: Displays "Page X of Y." Clicking it opens the ‘Navigation Pane’, allowing you to jump to different pages or headings.

Word Count: Shows the total words. If you highlight a sentence, it changes to show the selected word/s of total words,". Clicking it opens the window to see, total characters, paragraphs and lines.

Proofing Error: A tiny book icon. A checkmark means you're good; a red "X" means Word found a typo. Clicking it opens the Editor pane immediately.

A horizontal strip at the very bottom of the window that provides RT information about your document.



STATUS BAR CONT.

Language: Shows the dictionary being used (e.g., English (US/UK)).

Zoom Slider: A quick way to scale the document from 10% to 500%. Clicking the percentage number (e.g., "100%") opens a dialog box for precise scaling (like "Page Width").

View Modes: Print mode, view layout, web layout.

A horizontal strip at the very bottom of the window.

PRINTABLE CHARACTERS - FONT

Font:	The quick **brown** *fox* jumps over the lazy dog
Text size:	The quick brown fox jumps over the lazy dog
Bold:	**The quick brown fox jumps over the lazy dog**
Italic:	*The quick brown fox jumps over the lazy dog*
Underline:	The quick brown fox jumps over the lazy dog
Strikethrough:	The ~~quick brown~~ fox jumps over the ~~lazy~~ dog
Subscript: & superscript	The quic$_k$ b^{r}own fox jumps over the lazy dog
Text effects:	Shades, shadows, highlights, glow, etc.
Highlights:	The quick brown fox jumps over the lazy dog
Font colour:	The quick brown fox jumps over the lazy dog
Case change:	THE qUICK Brown FOX Jumps Over the Lazy Dog

PRINTABLE CHARACTERS - PARAGRAPH

Bullet Points/ Lists:

- The
- Quick
- Brown

1) Fox
2) Jumps
3) Over

Alignments: Left, Centre, Right, Justified Bold:

Indent: Increase and decrease indents

Spacing: Line and paragraph spacing

Text Direction: Left to right (EN), Right to left (AR, KU)

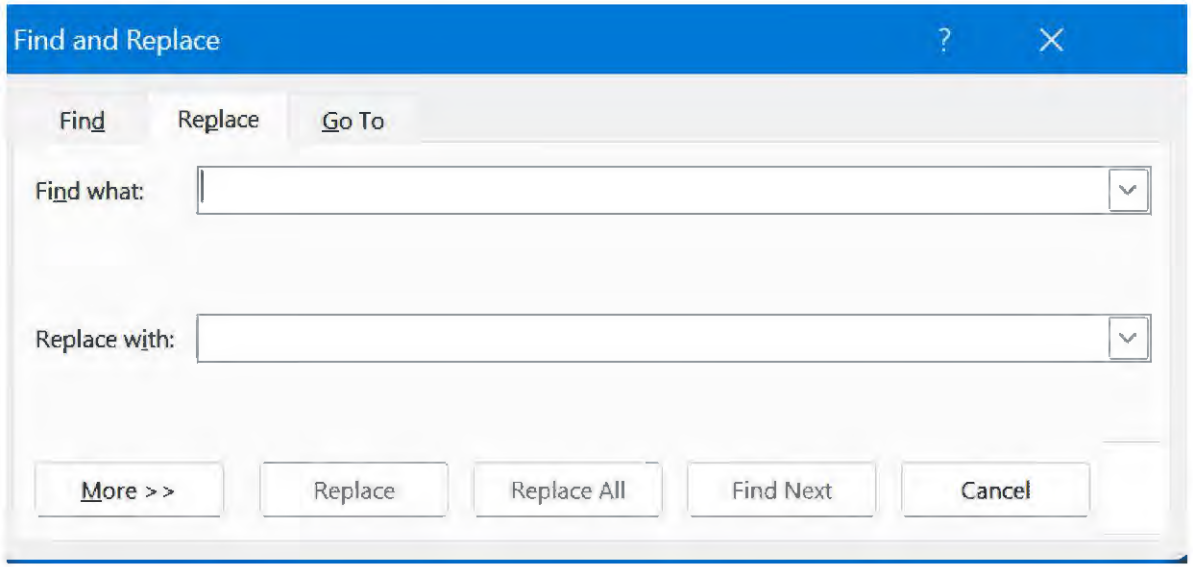
Shading: Similar to highlighting (larger area coverage)

Borders: Useful for tables too

Sort: Arrange alphabetically or numerically

EDITING

- Find (searching for characters, words or phrases)
- Replace (searching for characters or words and replacing with another)
- Selection Tool (text select, object select)



NON-PRINTABLE CHARACTERS

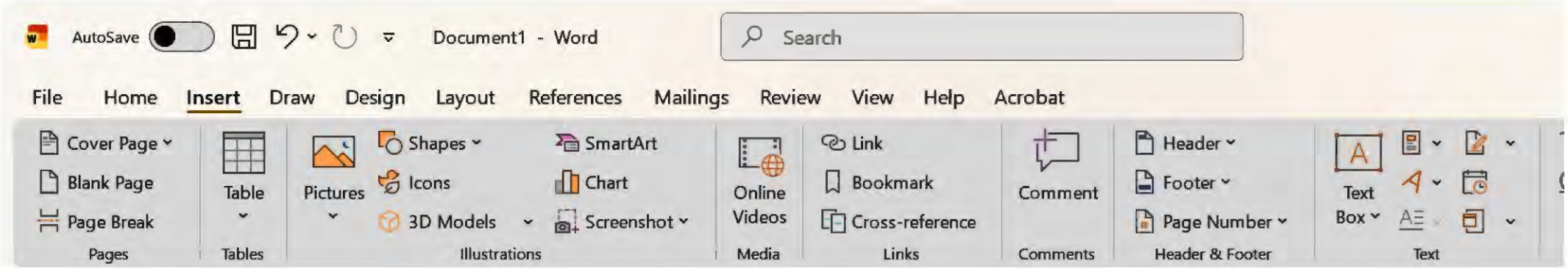
Also called "Formatting Marks“, hidden skeletal structure of a document. It represent every keystroke that doesn't result in a letter or number like spaces, tabs, and paragraph breaks.

Also·called·"Formatting·Marks”,·hidden·skeletal·structure·of·a·document.·It·represent·every·keystroke·that·doesn't·result·in·a·letter·or·number·like·spaces,·tabs,·and·paragraph·breaks.¶

¶

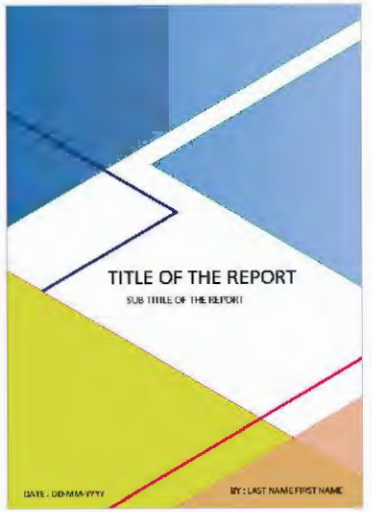
INSERT TAB

The Insert Tab is the creative part of the Ribbon. The Insert tab is for adding external elements to your document. Anything from a table or a picture to a digital signature. Think of it as the "Add Something New" tab.



PAGES

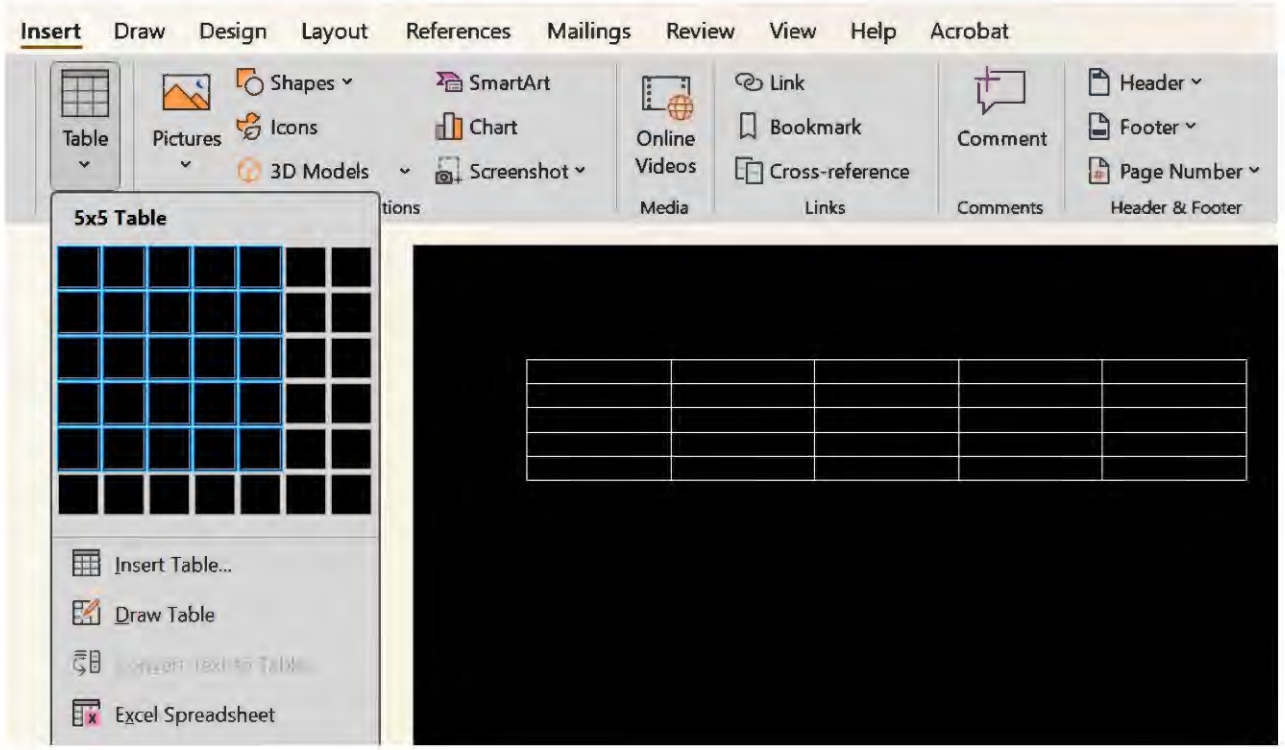
- Cover Page: professional first page (many designs available)
- Blank page (clean new empty page)
- Page Break (Ends the current page)



TABLES

Allows you to draw a grid or specify the exact number of **rows** and **columns**.

Excel Spreadsheet: embeds a "mini-Excel" window inside Word for complex math.



ILLUSTRATIONS

Pictures: Add images from computer or online

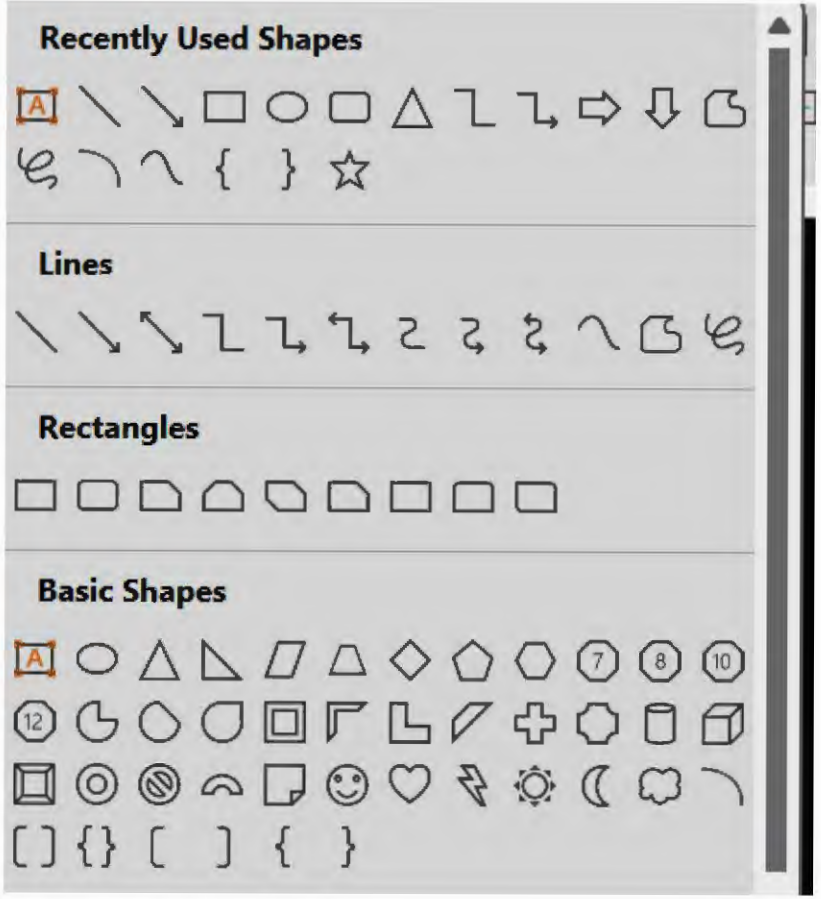
Shapes: Lines, arrows, and flowcharts

Icons & 3D Models: Modern, scalable vector graphics

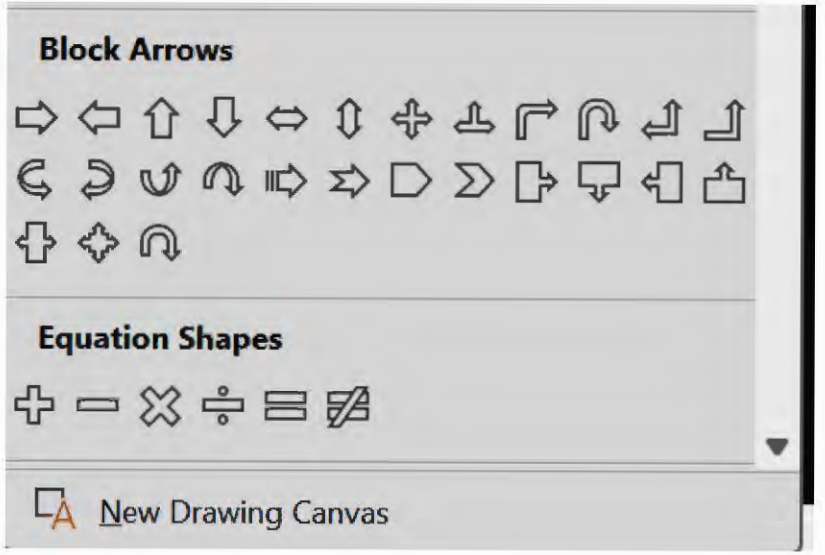
SmartArt: Pre-made diagrams (organisational charts or process flows) *[only on new versions]*

Chart: Inserts a graph (Bar, Pie, Line) that links to an Excel data window

ILLUSTRATIONS CONT.



Excellent for visualising data to the reader.



HEADER & FOOTER

Header/Footer: Information that repeats at the top or bottom of every page (e.g., Document Title, author name, etc.)

Page Number: Automates the "Page X of Y" numbering

TEXT GROUP

Text Box: Creates a "floating" container for text

WordArt: Decorative, stylised text for titles

Drop Cap: Makes the first letter of a paragraph large

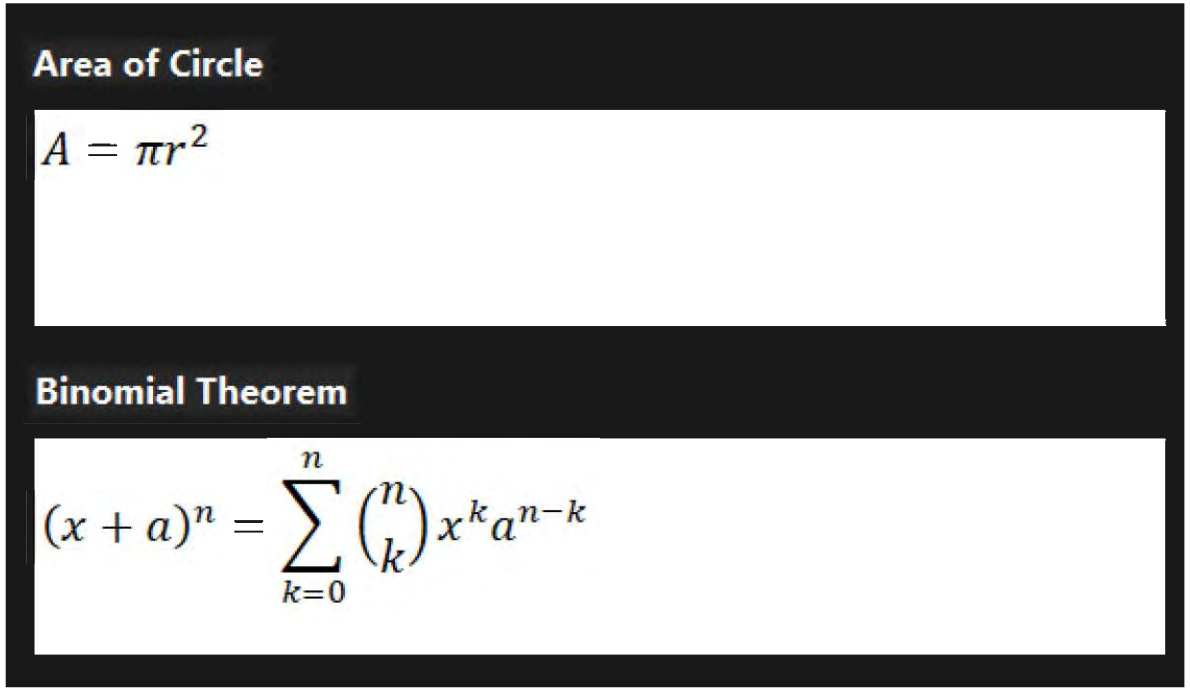
Date & Time: stamp anywhere on the document

Signature: a place for signature

SYMBOLS GROUP

Equation: A specialised editor for mathematical formulas

Symbol: For characters not on the keyboard, like the Copyright symbol (©) or Greek letters



SUMMARY

We explored the fundamental concepts of character encoding & decoding, explaining how computers translate human language & symbols into numerical data for storage and then back into readable text. Early standards like ASCII, had a limited character set, with the modern UTF-8 standard that supports global languages and emojis. Also introduced alternative number systems, specifically Hexadecimal (base-16) and Octal (base-8), highlighting their practical applications in areas such as RGB colour coding & memory addressing. We looked into practical word processing skills using MS Word, detailing the UI elements like the Ribbon and Status Bar, and explaining how to use various tabs to format text, insert objects like tables, and manage document layout through page breaks and margins.