DSBA SUMMER PRACTICE TASK

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Contents

1 Abstract

The purpose of this document is to learn basic ideas about working with LaTeX [1].

2 Introduction

Since my coursework report hardly has any formulas or tables ,the following document will also include tables, formulas and images from other sources.

3 Tables

3.1 First Table

ANOVA[1] table				
Source	DF[2]	SS	MS	F-score
row	2	293.19	420.	-7.04
column	2	161.19	406	-3.9
errors	4	83.19	-	-
Total	8	371.191	429.33	-

Table 1: ANOVA table with arbitary numbers

3.2 Second Table

№of color bar	RGB-values		
	Red	Green	Blue
1	136	117	98
2	152	127	113
3	152	127	110
4	145	122	103
5	140	119	102
6	143	121	103
7	164	109	89
8	141	120	103
9	144	121	103
10	145	123	105

Table 2: Some complex table based on data from my coursework.The lines are colored in the color of its rgb values.

[1] ANalysis Of VAriance
[2] degrees of freedom

4 Formulas

4.1 formula 1

The following formula is taken from my coursework.

Let $V_k = (R_i, G_i, B_i)$ be the rgb values of i-th color bar of the k-th volunteer and $U_k = (R_i, G_i, B_i)$ be the rgb values of the j-th color bar of the k-th volunteer. Then:

$$\forall i, j \in [1; 2) \cup (2; 10]$$

such that

$$i \neq j$$

$$\begin{cases} |R_i - R_j| \leq 5 \\ |G_i - G_j| \leq 4 \\ |B_i - B_j| \leq 5 \end{cases}$$

$$\begin{cases} R^* = 0.97 \\ R^* = 0.97 \\ R^* = 0.97 \end{cases}$$

4.2 formula 2

Some task from first course calculus hw redone in LaTeX.

$$\int_{-1}^{3} \frac{dx}{\sqrt{x^2 + 4x + 3}} = \int_{-1+\epsilon}^{3} \frac{dx}{\sqrt{(x+2)^2 - 1}} =$$

$$= \lim_{\epsilon \to 0} (\ln |\sqrt{(x+2)^2 - 1} + x + 2|) \Big|_{-1+\epsilon}^{3} =$$

$$= \lim_{\epsilon \to 0} (\ln |\sqrt{24} + 5| - \ln \sqrt{(1+\epsilon)^2} - 1 + \epsilon + 2) =$$

$$= \ln |\sqrt{24} + 5| \approx 2.3$$

4.3 formula 3

Some random formula.

$$\omega(x,t,n) = \sqrt{\frac{\lim_{x\to 0}(1+x^{-2})^{x^2}}{\int_0^x \frac{sint}{1+cos^2 t}\,dt}} \cdot \sum_{n=1}^{n} \frac{1}{n^2}$$

4.4 formula 4

Some task from this year calculus redone in LaTeX.

$$S_1 = \iint_D r\,dr\,d\phi = \int_0^{\frac{\pi}{3}} d\phi \int_0^{sin3\phi} r\,dr = \int_0^{\frac{\pi}{3}} (\frac{r^2}{2}\Big|_0^{sin3\phi})\,d\phi = \int_0^{\frac{\pi}{3}} \frac{sin^2 3\phi}{2}\,d\phi =$$

$$= \int_0^{\frac{\pi}{3}} \frac{1-cos6\phi}{4}\,d\phi = (\frac{1}{4}\phi - \frac{sin6\phi}{24})\Big|_0^{\frac{\pi}{3}} = \frac{\pi}{12} - \frac{sin2\pi}{12} = \frac{\pi}{12}$$

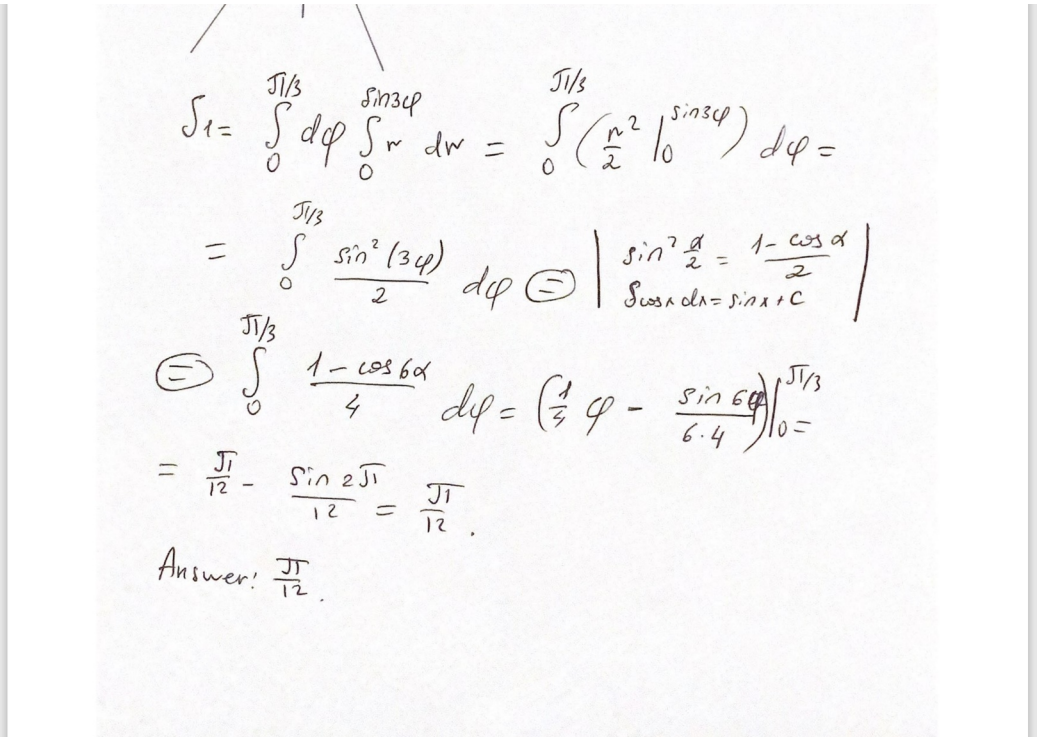
5 Lists

Example of making a large nested list with ordered and unordered sublists.

1. First item
   - cdot item
   - χ $\chi - item$
     (a) item a
     $\longrightarrow$ Some Item with arrow
     κ kappa item
     (b) item b
2. Second item
   (a) another a item
   (b) another b item
   (c) item c
   i. item i
   ii. item ii
   iii. item iii
   A. item A
   B. item B
   - sub B item
   - another sub B item
3. Third item
   - $\bar{A}$ A bar item
   - $\dot{\sigma}$ sigma-dot item
     – another sub item
     $*$ another subsubitem
     – another sub item

6 Images

Examples of working with images.



$$S_1 = \int_0^{\pi/3} d\varphi \int_0^{\sin 3\varphi} r\,dr = \int_0^{\pi/3} \left(\frac{r^2}{2}\Big|_0^{\sin 3\varphi}\right) d\varphi =$$

$$= \int_0^{\pi/3} \frac{\sin^2(3\varphi)}{2}\,d\varphi = \left| \sin^2\frac{\alpha}{2} = \frac{1-\cos\alpha}{2} \right| =$$

$$\int \cos x\,dx = \sin x + C$$

$$= \int_0^{\pi/3} \frac{1-\cos 6\alpha}{4}\,d\varphi = \left(\frac{1}{4}\varphi - \frac{\sin 6\varphi}{6\cdot 4}\right)\Big|_0^{\pi/3} =$$

$$= \frac{\pi}{12} - \frac{\sin 2\pi}{12} = \frac{\pi}{12}.$$

Answer: $\frac{\pi}{12}$.

Figure 1: formula 4

Figure 2: Grogu

You may notice, that formula on figure 1 is formula, which was LaTeXed before.You may also notice that there is baby yoda [2] to the left[1] from this text. Bellow, on figure 3 there are color bars from my coursework(linked together using LaTeX). Each color bar represent changes in dominant color of the image. As you may see in general, the changes are hardly visible by eyes.

[1]showing that I know how to place the image there

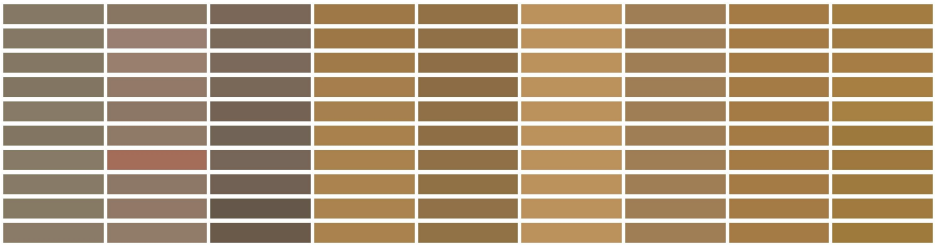


Figure 3

However for the second bar, they can be clearly seen. This bar is now to the right from this text on figure 4. The rgb values of this bar a represented in table 2 on page 4. Below, there are some images rotated and scaled using LaTeX.

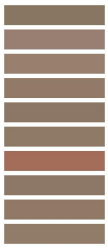
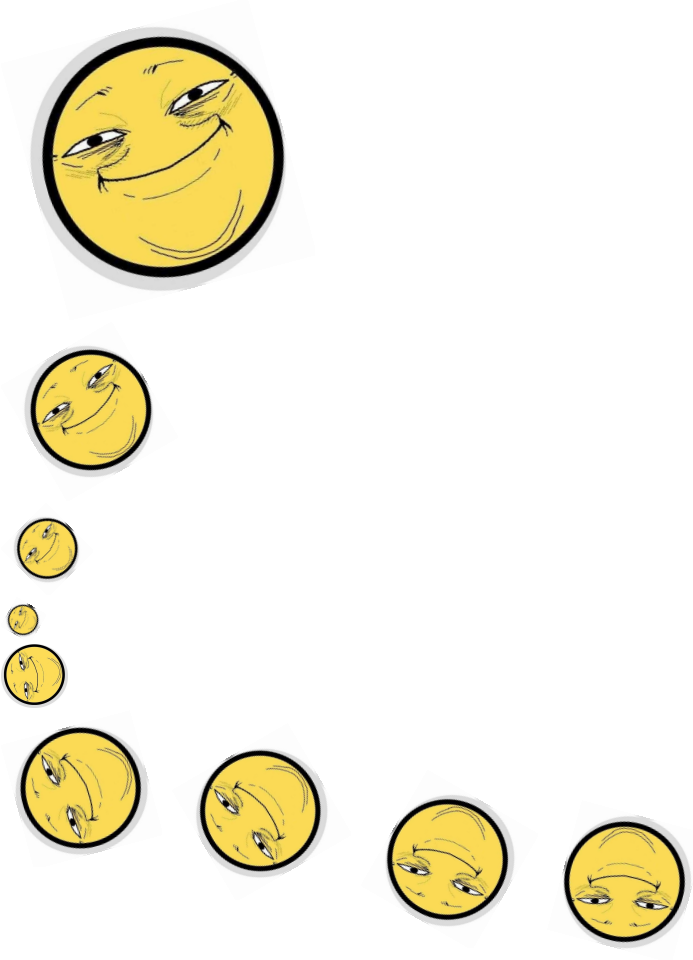


Figure 4



The end.

References

[1] L. Lamport. *I1 (\LaTeX)—A Document*, volume 410. pub-AW, 1985.

[2] J. Rocha. The baby yoda effect. *Better Living Through TV: Contemporary TV and Moral Identity Formation*, page 279, 2022.