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# SCRATCH: INTRODUCING KIDS TO PROGRAMMING

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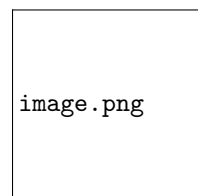
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## ABSTRACT

Data mining is a good way to find the relationship between raw data and predict the target we want which is also widely used in different field nowadays. In this project, we implement a lots of technology and method in data mining to predict the sale of an item based on its previous sale. We create a strong model to predict the sales. After evaluating this model, we conclude that this model can be used in normal life for future sale's prediction.

## 1 Introduction

```
main() {  
}
```



## 2 History

Scratch is not your traditional programming language, it's what's called a block-based visual programming language that was developed by the MIT Media Lab. It's primary purpose is to educate it's users of concepts and skills that can then be applied to other languages such as Java or C. The language first appeared in 2003 with the first desktop version of the language was developed, however it wasn't until 2007 when it was released to the public. The goal of the project was to teach young children to code in an easy fun and interactive way.

Today Scratch is on version 3.0, released in 2019, replacing it's predecessor Scratch 2.0 which was released on May 9, 2013. Today Scratch is used in many places across the globe and has been translated into 70+ languages. It is very prevalent in classrooms in all age ranges, scratch was developed in close coordination with a young audience at "Computer Clubhouses to maximize it's ease of use and educational effectiveness.

Scratch aims to simplify creating animations, games, and interactive stories, and simulations. Scratch 3.0 has it's own self contained paint editor and sound editor allowing users to create assets all within one suite. Scratch targets kids within the age range of 8-16 years old, often giving the kids a brief glimpse into Computer Science for the first time.

### 3 Control Structures

### 4 Data Types

### 5 Subprograms

### 6 Summary

### 7 LaTeX example code

We are provided with five datasets from Kaggle: Sales train, Sale test, items, item categories and shops. In the Sales train dataset, it provides the information about the sales' number of an item in a shop within a day. In the Sales test dataset, it provides the shop id and item id which are the items and shops we need to predict. In the other three datasets, we can get the information about item's name and its category, and the shops' name.

**Task modeling.** We approach this task as a regression problem. For every item and shop pair, we need to predict its next month sales(a number).

**Construct train and test data.** In the Sales train dataset, it only provides the sale within one day, but we need to predict the sale of next month. So we sum the day's sale into month's sale group by item, shop, date(within a month). In the Sales train dataset, it only contains two columns(item id and shop id). Because we need to provide the sales of next month, we add a date column for it, which stand for the date information of next month.

#### 7.1 Headings: second level

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$$\xi_{ij}(t) = P(x_t = i, x_{t+1} = j | y, v, w; \theta) = \frac{\alpha_i(t) a_{ij}^{w_t} \beta_j(t+1) b_j^{v_{t+1}}(y_{t+1})}{\sum_{i=1}^N \sum_{j=1}^N \alpha_i(t) a_{ij}^{w_t} \beta_j(t+1) b_j^{v_{t+1}}(y_{t+1})} \quad (1)$$

##### 7.1.1 Headings: third level

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### 8 Examples of citations, figures, tables, references

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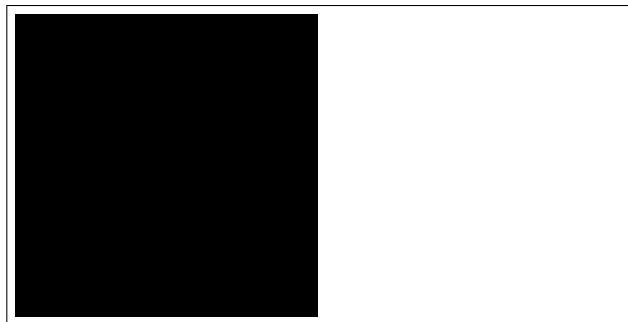


Figure 1: Sample figure caption.

	item_name	item_id	item_category_id
0	! ВО ВЛАСТИ НАВАЖДЕНИЯ (ПЛАСТ.) D	0	40
1	!ABBYY FineReader 12 Professional Edition Full...	1	76
2	***В ЛУЧАХ СЛАВЫ (UNV) D	2	40
3	***ГОЛУБАЯ ВОЛНА (Univ) D	3	40
4	***КОРОБКА (СТЕКЛО) D	4	40

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The documentation for natbib may be found at

<http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf>

Of note is the command `\citet`, which produces citations appropriate for use in inline text. For example,

```
\citet{hasselmo} investigated\dots
```

produces

Hasselmo, et al. (1995) investigated...

<https://www.ctan.org/pkg/booktabs>

## 8.1 Figures

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## 8.2 Tables

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<sup>1</sup>Sample of the first footnote.

Table 1: Sample table title

Part		
Name	Description	Size ( $\mu\text{m}$ )
Dendrite	Input terminal	$\sim 100$
Axon	Output terminal	$\sim 10$
Soma	Cell body	up to $10^6$

facilis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo. See awesome Table 1.

### 8.3 Lists

- Lorem ipsum dolor sit amet
- consectetur adipiscing elit.
- Aliquam dignissim blandit est, in dictum tortor gravida eget. In ac rutrum magna.

### References

- [1] George Kour and Raid Saabne. Real-time segmentation of on-line handwritten arabic script. In *Frontiers in Handwriting Recognition (ICFHR), 2014 14th International Conference on*, pages 417–422. IEEE, 2014.
- [2] George Kour and Raid Saabne. Fast classification of handwritten on-line arabic characters. In *Soft Computing and Pattern Recognition (SoCPaR), 2014 6th International Conference of*, pages 312–318. IEEE, 2014.
- [3] Guy Hadash, Einat Kermany, Boaz Carmeli, Ofer Lavi, George Kour, and Alon Jacovi. Estimate and replace: A novel approach to integrating deep neural networks with existing applications. *arXiv preprint arXiv:1804.09028*, 2018.