# **School of Computing, Engineering and Mathematics**



**An investigation into creating a python based programming language and the educational implications of presenting it to year 8 Computing students**

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25th of April 2016

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**Abstract**

This project has mainly two objectives: First is to create a programming language from scratch using Python. Second is to evaluate whether year 8 students would benefit from learning it in addition to the the programming language they are studying at the moment (SCATCH2).

In order to achieve the goal, I had to create the language syntax, and then, in the lexical analysis phase, to create tokens that assign a type to every character or set of characters in the original text, followed by the parsing phase, which involves taking the tokens and converting them into intermediate code and then in the code generation phase, the intermediate code has been converted into executables. In regards to the applicable part of this project, the year 8 students at Cardinal Wiseman School in Coventry had to attend a lesson that I taught about Prog, which is the name of my programming language, then they completed a test, both in SCRATCH2 and Prog, followed up by a questionnaire highlighting the learning outcomes of the lesson.

I consider that the project has been a success as the students have gained more knowledge of how computational thinking works, and the project can easily be reproduced and even more importantly, studied in more in-depth.

**Acknowledgements**

Firstly, I want to thank Dr. Abdulrahman for providing so much support and inspiration into finalising this project. Without his help I might have ended up doing a project that I have never enjoyed and would have looked like: “just another project”. I also want to thank Professor Anne James for using her time to read this paper and also to listen to my presentation about what I have done. Also, I want to thank every teacher from Cardinal Wiseman School for being so understanding and believing in the fact that I could teach their pupils a programming language that I created. Last but not least, I want to thank my family for supporting me in all those years into achieving my dreams.

**Introduction**

As in the past few year, there has been a lot of reforms in the educational system in the UK, regarding IT studies converging to Computer Studies or Computer Science in the Secondary and Pre-University Sector, I considered that I could have a look at this issue. Followed by this interest, starting to teach at Cardinal Wiseman School, I realized that SCARTCH2 does not offer enough support into understanding how computational thinking and forward planning works. Therefore, I decided that I was going to write a programming language of my own, which will push pupils minds into thinking forward.