

# CS2309 Homework 1

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## 1 Expectation

I hope this module can force me to read some research papers and formulate my own research idea for my Final Year Project next year, which I hope to be a interdisciplinary paper between Pure Mathematics and Computer Science, for example in the area of Type Theory and Constructive Mathematics. I also hope to survey other fields in theoretical CS and find something that I might be interested in.

## 2 Research Interest

My research interest is currently related to Type Systems, Theorem Proving and possibly Software Verification. I am interested about how type system can not only bring about safer programs, furthermore verify programs in terms of mathematical proofs, which guarantees correctness. Theoretically, I am interested in the modelling of computation in Type Theory (lambda calculus), Proof Theory (mathematical logic) and possibly Category Theory as well.

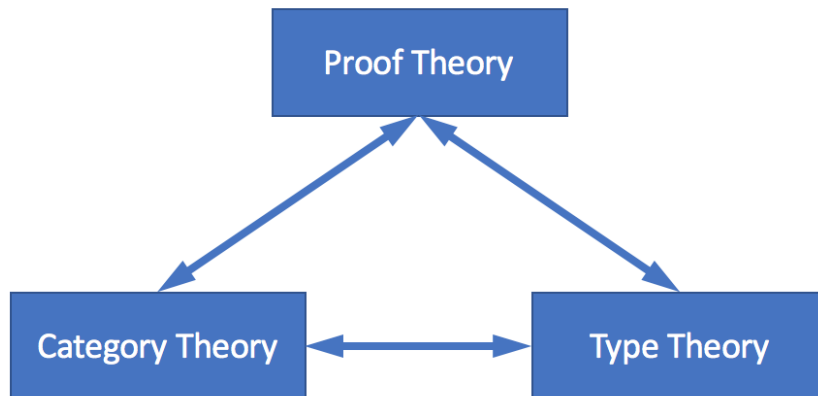


Figure 1: The 3-way correspondence between Proof, Type and Category Theories.

### 3 General awareness

Shopback is a wildly successful Singapore startup, one of whose product I use on a daily basis. Started in 2014, it has now offices in 9 countries and counting. Same as all internet and shopping companies, it has a tech team which is at the forefront of innovation (see Technical Blog), especially when they now extend their services from providing cashback to shopping, which immediately brings about the issues in Search Ranking and Merchant Evaluation, and the challenges and their solutions are documented well on the technical blog.