

## Four Steps to use Chatbot

**Step 1:** The chatbot covers most topics (Basics, Selection, Repetition, Function, and Array) of the introductory programming course as shown in figure 1. The command push buttons are designed for getting quick query-answers for the related topics of the Course. Furthermore, a user can find information by typing it in the persistent menu as shown in figure 1. A brief explanation of each topic is provided as textual, audio and animated formats.

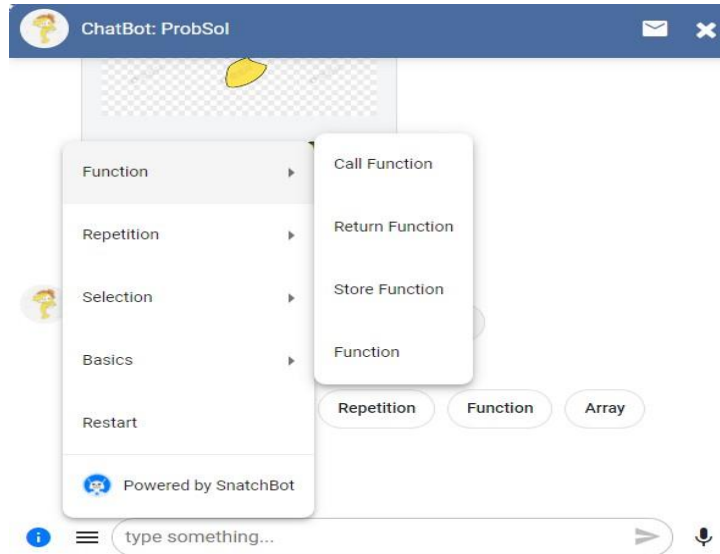


Figure 1: Programming Topics in chatbot

**Steps 2:** Common programming errors (syntax and semantics) are also covered in the chatbot as shown in figure 2. The common programming errors are given for most teaching topics of the course in the chatbot. For example, the common basic syntax errors include Missing Semicolon, Undeclared Variable, Mismatch variable, Data Type Mismatch, Invalid Variable and Basics as shown in figure 2. Users can access programming errors by clicking on the button or by typing the error in the Persistent Menu as shown in figure 2.

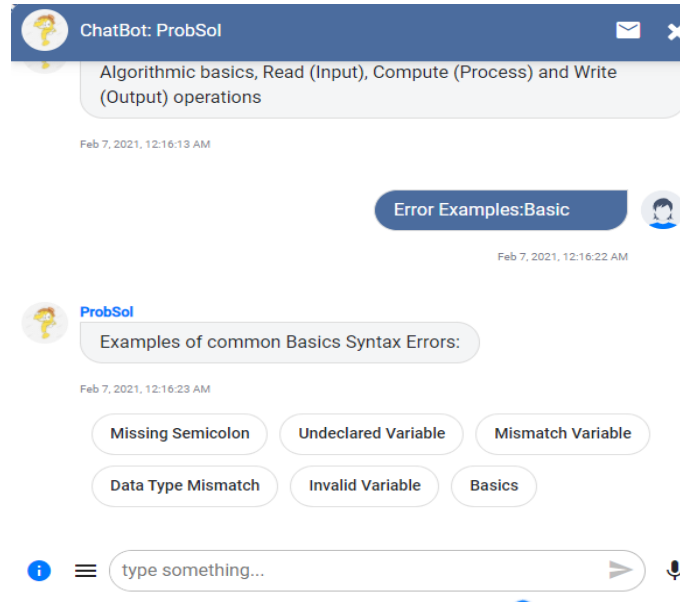


Figure 2: Common Programming Errors (Syntax and Semantics)

**Step 3:** Each programming error is presented by showing a programming code with error type and reason of that particular error as shown in figure 3. Each error is given a name which is shown in the first line. A programming code related to the error is provided with the line numbers. A brief explanation of the error is provided in the Reason section with the line number where the error is occurred in the programming code.

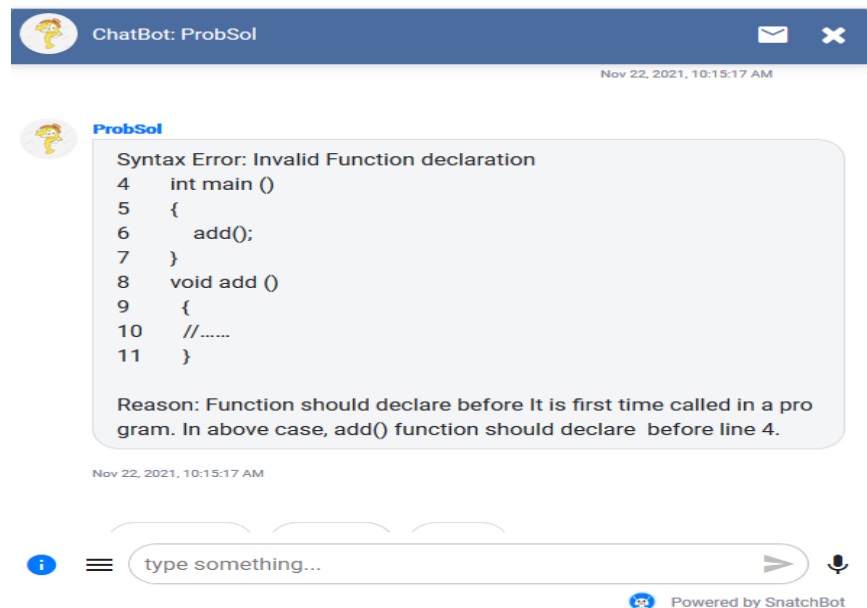


Figure 3: Example of Syntax Error

**Step 4:** The course details (description, SLOs, exams dates, contact details of the course instructor) are also included in the chatbot as shown in figure 4. The 'Description' sub-menu button shows a brief description

about the Introductory Programming Course. The ‘SLOs’ sub-menu button shows various Student Learning Outcomes of the course. The ‘Exams’ sub-menu button shows Exam details of the same course. The ‘Contact’ sub-menu button shows a brief description about the contact details about the Course Instructor.

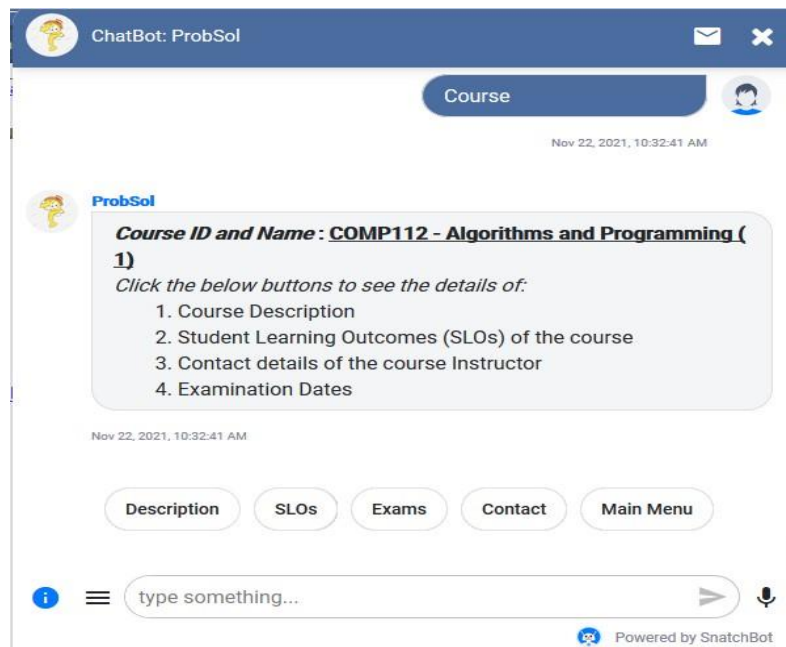


Figure 4: Introductory programming course details