Process mining on students' web learning traces: a case study with an ethnographic analysis

GOAL

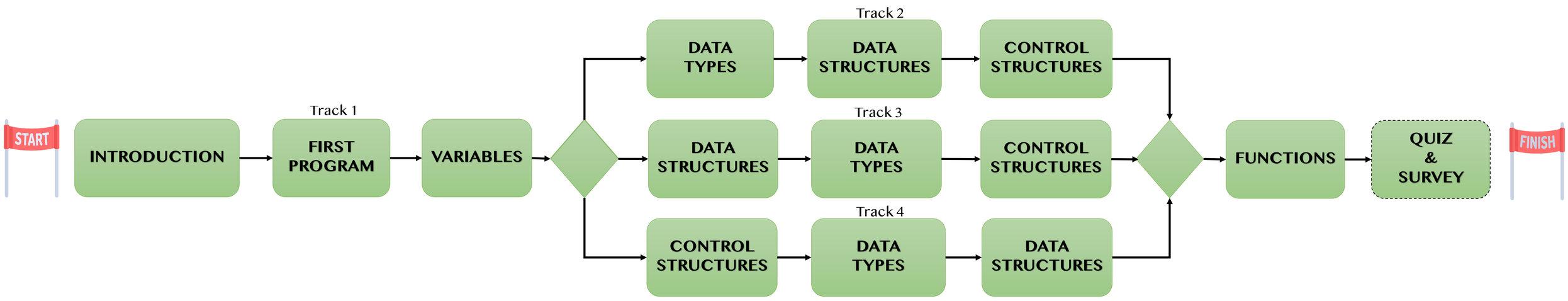
The study of learning processes can benefit from examining the digital traces left by students while browsing educational platforms. In this work, **we propose an analysis of how process mining (PM) techniques can be combined with online educational technologies**.

CASE STUDY

We consider a **web tutorial of the programming language Python with different learning paths** (tracks).
The use of PM during the execution of the tutorial is twofold:
1) provide useful insights for improving the tutorial itself;
2) the analysis of the collected data can be used as an evaluation tool for teachers.

METHODOLOGY

LEARNING PATH (http://webtutorial.altervista.org/python)

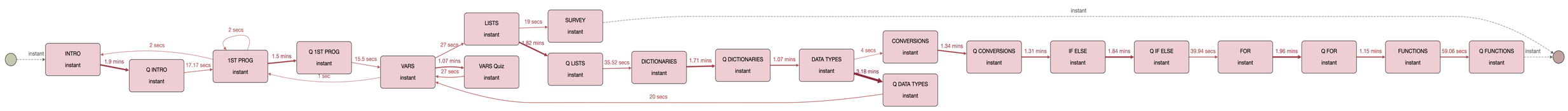


EVENT LOG TRACES

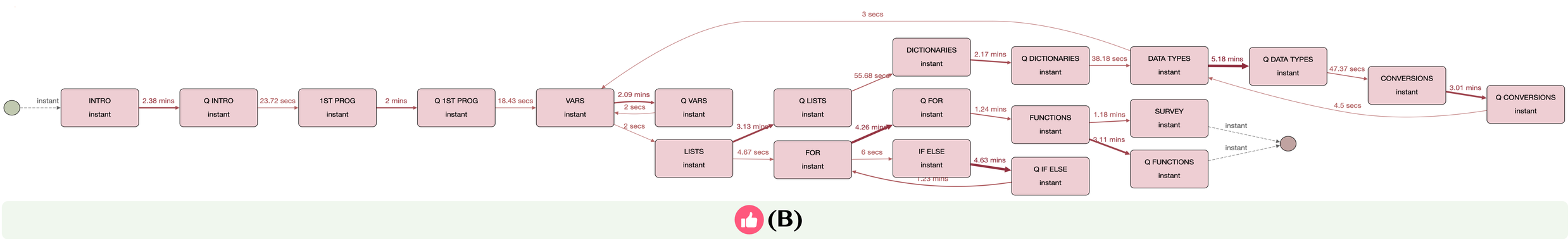
sessionID;	activity;	track;	pageOrder;	eventDescription;	eventTimestamp;	QuizRatio
ID1;	INTRO;	track_1;	01;	PageIN;	2023-02-24 14:00:04;	0.4
ID1;	INTRO;	track_1;	01;	PageOUT;	2023-02-24 14:03:16;	0.4
ID1;	INTRO-Q;	track_1;	01;	PageIN;	2023-02-24 14:03:41;	0.4
ID1;	PROG;	track_1;	02;	PageIN;	2023-02-24 14:05:46;	0.4
ID1;	PROG;	track_1;	02;	PageOUT;	2023-02-24 14:06:32;	0.4
…	…	…	…	…	…	…

event log discovery with Apromore (https://apromore.com)

PM (case duration)



(A)



(B)

RESULTS

Figure (A) shows a quite linear learning process for **low performance cases** (mean case duration of **28.4 minutes**), with quiz result below average. Figure (B) suggests how **best students** have a more complicated learning process (mean case duration of **43.6 minutes**), with quiz result above average.

AUTHORS AND ACKOWLEDGEMENTS

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