**15-745: Optimizing Compilers**

**Assignment 1 Writeup**

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TODO: brief report on pass implementation

TODO: Source code listing

**5.1 CFG Basics**

Basic blocks:

**B1:** x = 100

y = 0

goto L2

**B2:**  L1: y = x \* y

if (x < 50) goto L2

**B3:** y = x - y

goto L3

**B4:** L2: y = x + y

**B5:** L3: print(y)

if (y < 1000) goto L1

**B6:** switch (x) { 0 => L6 |

**B7:** 1 => L4 |

**B8:** 101 => L7

**B9:**  default => L5 }

**B10:** L4: print("!")

**B11:** L5: x = x - 1

goto L1

**B12:** L6: return y

TODO: CFG graph

**5.2 Available Expressions**

|  |  |  |
| --- | --- | --- |
| **BB** | **EVAL** | **KILL** |
| 1 | b+c, b\*b, b\*d |  |
| 2 | b+c, i+1 |  |
| 3 | b\*b |  |
| 4 | b\*b | b\*d |
| 5 | i+1 |  |

|  |  |  |
| --- | --- | --- |
| **BB** | **IN** | **OUT** |
| 1 | {} | b+c, b\*b, b\*d |
| 2 | b+c, b\*b, b\*d | b+c, b\*b, b\*d, i+1 |
| 3 | b+c, b\*b, b\*d, i+1 | b+c, b\*b, b\*d, i+1 |
| 4 | b+c, b\*b, b\*d, i+1 | b+c, b\*b, i+1 |
| 5 | b+c, b\*b, i+1 | b+c, b\*b, i+1 |

**5.3 Faint Analysis**

1. Set of elements: **Set of variables**

2. Backward analysis

3.