PA - Assignment 1

Manish Mahalwal
2016054

References: https://gist.github.com/monperrus/1354641
Reference: https://stackoverflow.com/a/6792566/6883821
Mentioned in code also.

- **while**

[if i < 5 goto $r1 = <java.lang.System: java.io.PrintStream out>, $r1 = <java.lang.System: java.io.PrintStream out>, $r0 = new java.lang.StringBuilder, specialinvoke $r0.<java.lang.StringBuilder: void <init>(java.lang.String)>("Print "), $r0 = virtualinvoke $r0.<java.lang.StringBuilder: java.lang.StringBuilder append(int)>(i), $r2 = virtualinvoke $r0.<java.lang.StringBuilder: java.lang.String toString()>(), virtualinvoke $r1.<java.io.PrintStream: void println(java.lang.String)>($r2), i = i + 1]

- **for**

[if j < 5 goto $r1 = <java.lang.System: java.io.PrintStream out>, $r1 = <java.lang.System: java.io.PrintStream out>, $r0 = new java.lang.StringBuilder, specialinvoke $r0.<java.lang.StringBuilder: void <init>(java.lang.String)>("Print "), $r0 = virtualinvoke $r0.<java.lang.StringBuilder: java.lang.StringBuilder append(int)>(j), $r2 = virtualinvoke $r0.<java.lang.StringBuilder: java.lang.String toString()>(), virtualinvoke $r1.<java.io.PrintStream: void println(java.lang.String)>($r2), j = j + 1]

- **Do-while**

```
int k=0;
do {
        System.out.println("Print "+k);
        k++;
}while(k<5);
```

[$r1 = <java.lang.System: java.io.PrintStream out>, $r0 = new java.lang.StringBuilder, specialinvoke $r0.<java.lang.StringBuilder: void <init>(java.lang.String)>("Print "), $r0 = virtualinvoke $r0.<java.lang.StringBuilder: java.lang.StringBuilder append(int)>(k), $r2 = virtualinvoke $r0.<java.lang.StringBuilder: java.lang.String toString()>(), virtualinvoke $r1.<java.io.PrintStream: void println(java.lang.String)>($r2), k = k + 1, if k < 5 goto $r1 = <java.lang.System: java.io.PrintStream out>]

- **While with variable initialised somewhere else**
  static int loop = 0;

```
static int status = 1;
static Parent p = new Parent ();

static void print ()
{
        while(loop<5) {
                System.out.println("Print "+loop);
                loop++;
        }
```

[$i1 = <Testing.Tester: int loop>, if $i1 < 5 goto $r0 = <java.lang.System: java.io.PrintStream out>, $r0 = <java.lang.System: java.io.PrintStream out>, $r1 = new java.lang.StringBuilder, specialinvoke $r1.<java.lang.StringBuilder: void <init>(java.lang.String)>("Print "), $i0 = <Testing.Tester: int loop>, $r1 = virtualinvoke $r1.<java.lang.StringBuilder: java.lang.StringBuilder append(int)>($i0), $r2 = virtualinvoke $r1.<java.lang.StringBuilder: java.lang.String toString()>(), virtualinvoke $r0.<java.io.PrintStream: void println(java.lang.String)>($r2), $i1 = <Testing.Tester: int loop>, $i1 = $i1 + 1, <Testing.Tester: int loop> = $i1]

There is absolutely no difference between for and while. Do-while can be differentiated on the basis of the goto label.