

Black Box Test Plan - RobustPaycheck Program

Requirements

Raleigh's Parks and Recreation Department hires landscapers to care for and maintain the city's parks.

An employee has one of three skill levels; each with a hourly pay rate:

Skill Level - Hourly Pay Rate (\$)

Level 1 - \$19.00

Level 2 - \$22.50

Level 3 - \$25.75

All employees may opt in for insurance, which results in a deduction from their pay check.

Deduction - Weekly Cost (\$)

Option 1 - Medical Insurance - \$24.50

Option 2 - Dental Insurance - \$15.30

Option 3 - Vision Insurance - \$5.25

Employees at skill level 3 may also opt to place up to 6% of their gross pay into a retirement account.

The following information is printed about the employee's pay check: 1) employee's name 2) hours worked for a week 3) hourly pay rate 4) regular pay for up to 40 hours worked 5) overtime pay (1.5 pay rate) for hours over 40 worked 6) gross pay (regular + overtime) 7) total deductions 8) net pay (gross pay – total deductions). If the net pay is negative, meaning the deductions exceeds the gross pay, then an error is printed.

This version of the program has extensive error checking and loops to allow for processing more than one paycheck at a time. The following commands compile and run the RobustPaycheck program:

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```
$ javac RobustPaycheck.java  
$ java RobustPaycheck
```

Black Box Test Plan

The text in bold in the **Description** column represents the test inputs to the program. You can stop program execution by

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Test ID	Description	Expected Results								Actual Results
Boundary regular hours, All insurances, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Alice Anderson Employee Level: 1 Hours Worked: 0 <Stop program>	Enter the number of hours worked. Hours Worked:								
Boundary regular hours, Two insurances, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Bob Baker Employee Level: 1 Hours Worked: 1 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): Y New paycheck (Y/N): N	<Error Message>								
Mid-range regular hours, Two insurances, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Carol Cole Employee Level: 1 Hours Worked: 10 Medical Insurance (Y/N): Y Dental Insurance (Y/N): N Vision Insurance (Y/N): Y New paycheck (Y/N): N	Name	Hours	PayRate	Regular	OT	Gross	Deduc.	Net	
		Carol Cole	10.00	19.00	190.00	0.00	190.00	29.75	160.25	

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Test ID	Description	Expected Results								Actual Results
Mid-range regular hours, Two insurances, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Danny D David Employee Level: 1 Hours Worked: 20 Medical Insurance (Y/N): Y Dental Insurance (Y/N): Y Vision Insurance (Y/N): N New paycheck (Y/N): N	Name Danny D David	Hours 20.00	PayRate 19.00	Regular 380.00	OT 0.00	Gross 380.00	Deduc. 39.80	Net 340.20	
Boundary regular hours, One insurance, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Ellen Edwards Employee Level: 1 Hours Worked: 39 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): Y New paycheck (Y/N): N	Name Ellen Edwards	Hours 39.00	PayRate 19.00	Regular 741.00	OT 0.00	Gross 741.00	Deduc. 5.25	Net 735.75	
Boundary regular hours, One insurance, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Frank Frankenstein Employee Level: 1 Hours Worked: 40 Medical Insurance (Y/N): Y Dental Insurance (Y/N): N Vision Insurance (Y/N): N New paycheck (Y/N): N	Name Frank Frankenstein	Hours 40.00	PayRate 19.00	Regular 760.00	OT 0.00	Gross 760.00	Deduc. 24.50	Net 735.50	

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Test ID	Description	Expected Results								Actual Results
Boundary overtime hours, One insurance, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: George George Employee Level: 1 Hours Worked: 41 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): N New paycheck (Y/N): N	Name George George	Hours 41.00	PayRate 19.00	Regular 760.00	OT 28.50	Gross 788.50	Deduc. 15.30	Net 773.20	
Mid-range overtime hours, No insurance, Level 1	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Hilda Henderson Employee Level: 1 Hours Worked: 50 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): N New paycheck (Y/N): N	Name Hilda Henderson	Hours 50.00	PayRate 19.00	Regular 760.00	OT 285.00	Gross 1045.00	Deduc. 0.00	Net 1045.00	
Boundary regular hours, All insurances, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Alice Anderson Employee Level: 2 Hours Worked: 0 <Stop program>	Enter the number of hours worked. Hours Worked:								

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Test ID	Description	Expected Results								Actual Results
Boundary regular hours, Two insurances, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Bob Baker Employee Level: 2 Hours Worked: 1 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): Y New paycheck (Y/N): N	Name Bob Baker	Hours 1.00	PayRate 22.50	Regular 22.50	OT 0.00	Gross 22.50	Deduc. 20.55	Net 1.95	
Mid-range regular hours, Two insurances, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Carol Cole Employee Level: 2 Hours Worked: 10 Medical Insurance (Y/N): Y Dental Insurance (Y/N): N Vision Insurance (Y/N): Y New paycheck (Y/N): N	Name Carol Cole	Hours 10.00	PayRate 22.50	Regular 225.00	OT 0.00	Gross 225.00	Deduc. 29.75	Net 195.25	
Mid-range regular hours, Two insurances, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Danny D David Employee Level: 2 Hours Worked: 20 Medical Insurance (Y/N): Y Dental Insurance (Y/N): Y Vision Insurance (Y/N): N New paycheck (Y/N): N	Name Danny D David	Hours 20.00	PayRate 22.50	Regular 450.00	OT 0.00	Gross 450.00	Deduc. 39.80	Net 410.20	

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Test ID	Description	Expected Results								Actual Results
Boundary regular hours, One insurance, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Ellen Edwards Employee Level: 2 Hours Worked: 39 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): Y New paycheck (Y/N): N	Name Ellen Edwards	Hours 39.00	PayRate 22.50	Regular 877.50	OT 0.00	Gross 877.50	Deduc. 5.25	Net 872.25	
Boundary regular hours, One insurance, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Frank Frankenstein Employee Level: 2 Hours Worked: 40 Medical Insurance (Y/N): Y Dental Insurance (Y/N): N Vision Insurance (Y/N): N New paycheck (Y/N): N	Name Frank Frankenstein	Hours 40.00	PayRate 22.50	Regular 900.00	OT 0.00	Gross 900.00	Deduc. 24.50	Net 875.50	
Boundary overtime hours, One insurance, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: George George Employee Level: 2 Hours Worked: 41 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): N New paycheck (Y/N): N	Name George George	Hours 41.00	PayRate 22.50	Regular 900.00	OT 33.75	Gross 933.75	Deduc. 15.30	Net 918.45	

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Test ID	Description	Expected Results								Actual Results
Mid-range overtime hours, No insurance, Level 2	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Hilda Henderson Employee Level: 2 Hours Worked: 50 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): N New paycheck (Y/N): N	Name Hilda Henderson	Hours 50.00	PayRate 22.50	Regular 900.00	OT 337.50	Gross 1237.50	Deduc. 0.00	Net 1237.50	
Boundary regular hours, All insurances, Level 3, Boundary retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Alice Anderson Employee Level: 3 Hours Worked: 0 <Stop program>	Enter the number of hours worked. Hours Worked:								
Boundary regular hours, Two insurances, Level 3, Boundary retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Bob Baker Employee Level: 3 Hours Worked: 1 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): Y Retirement Percentage (0-6): 1 New paycheck (Y/N): N	Name Bob Baker	Hours 1.00	PayRate 25.75	Regular 25.75	OT 0.00	Gross 25.75	Deduc. 20.80	Net 4.95	

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Test ID	Description	Expected Results								Actual Results
Mid-range regular hours, Two insurances, Level 3, Boundary retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Carol Cole Employee Level: 3 Hours Worked: 10 Medical Insurance (Y/N): Y Dental Insurance (Y/N): N Vision Insurance (Y/N): Y Retirement Percentage (0-6): 1 New paycheck (Y/N): N	Name Carol Cole	Hours 10.00	PayRate 25.75	Regular 257.50	OT 0.00	Gross 257.50	Deduc. 32.32	Net 225.18	
Mid-range regular hours, Two insurances, Level 3, Mid-range retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Danny D David Employee Level: 3 Hours Worked: 20 Medical Insurance (Y/N): Y Dental Insurance (Y/N): Y Vision Insurance (Y/N): N Retirement Percentage (0-6): 4 New paycheck (Y/N): N	Name Danny D David	Hours 20.00	PayRate 25.75	Regular 515.00	OT 0.00	Gross 515.00	Deduc. 60.40	Net 454.60	
Boundary regular hours, One insurance, Level 3, Boundary retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Ellen Edwards Employee Level: 3 Hours Worked: 39 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): Y Retirement Percentage (0-6): 5 New paycheck (Y/N): N	Name Ellen Edwards	Hours 39.00	PayRate 25.75	Regular 1004.25	OT 0.00	Gross 1004.25	Deduc. 55.46	Net 948.79	

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Test ID	Description	Expected Results								Actual Results
Boundary regular hours, One insurance, Level 3, Boundary retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Frank Frankenstein Employee Level: 3 Hours Worked: 40 Medical Insurance (Y/N): Y Dental Insurance (Y/N): N Vision Insurance (Y/N): N Retirement Percentage (0-6): 6 New paycheck (Y/N): N	Name Frank Frankenstein	Hours 40.00	PayRate 25.75	Regular 1030.00	OT 0.00	Gross 1030.00	Deduc. 86.30	Net 943.70	
Boundary overtime hours, One insurance, Level 3, Mid-range retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: George George Employee Level: 3 Hours Worked: 41 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): N Retirement Percentage (0-6): 2 New paycheck (Y/N): N	Name George George	Hours 41.00	PayRate 25.75	Regular 1030.00	OT 38.62	Gross 1068.62	Deduc. 36.67	Net 1031.95	
Mid-range overtime hours, No insurance, Level 3, Mid-range retirement	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Hilda Henderson Employee Level: 3 Hours Worked: 50 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): N Retirement Percentage (0-6): 3 New paycheck (Y/N): N	Name Hilda Henderson	Hours 50.00	PayRate 25.75	Regular 1030.00	OT 386.20	Gross 1416.20	Deduc. 42.48	Net 1373.72	

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Test ID	Description	Expected Results								Actual Results
Invalid Level 0	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Alice Anderson Employee Level: 0 <Stop program>	Enter a valid level: 1, 2, or 3. Employee Level:								
Invalid Level 4	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Alice Anderson Employee Level: 4 <Stop program>	Enter a valid level: 1, 2, or 3. Employee Level:								
No new paycheck	Preconditions: RobustPaycheck program started New paycheck (Y/N): N	<Program ends without output>								
Multiple new paychecks	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: George George Employee Level: 3 Hours Worked: 41 Medical Insurance (Y/N): N Dental Insurance (Y/N): Y Vision Insurance (Y/N): N Retirement Percentage (0-6): 2 New paycheck (Y/N): Y Employee Name: Hilda Henderson Employee Level: 3 Hours Worked: 50 Medical Insurance (Y/N): N Dental Insurance (Y/N): N Vision Insurance (Y/N): N Retirement Percentage (0-6): 3 New paycheck (Y/N): N	Name	Hours	PayRate	Regular	OT	Gross	Deduc.	Net	
		George George	41.00	25.75	1030.00	38.62	1068.62	36.67	1031.95	
		Name	Hours	PayRate	Regular	OT	Gross	Deduc.	Net	
		Hilda Henderson	50.00	25.75	1030.00	386.20	1416.20	42.48	1373.72	

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Test ID	Description	Expected Results	Actual Results
Invalid input for insurance	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Frank Frankenstein Employee Level: 3 Hours Worked: 40 Medical Insurance (Y/N): Q <Stop program>	Enter a "Y" or "N" Medical Insurance (Y/N) :	
Mid-range regular hours, Two insurances, Level 3, Invalid retirement (-1)	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Danny D David Employee Level: 3 Hours Worked: 20 Medical Insurance (Y/N): Y Dental Insurance (Y/N): Y Vision Insurance (Y/N): N Retirement Percentage (0-6): -1 <Stop program>	Enter a retirement percentage (0-6) . Retirement Percentage (0-6) :	
Mid-range regular hours, Two insurances, Level 3, Invalid retirement (7)	Preconditions: RobustPaycheck program started New paycheck (Y/N): Y Employee Name: Danny D David Employee Level: 3 Hours Worked: 20 Medical Insurance (Y/N): Y Dental Insurance (Y/N): Y Vision Insurance (Y/N): N Retirement Percentage (0-6): 7 <Stop program>	Enter a retirement percentage (0-6) . Retirement Percentage (0-6) :	
Invalid input for new paycheck	Preconditions: RobustPaycheck program started New paycheck (Y/N): Q <Stop program>	Enter a "Y" or "N" New paycheck (Y/N) :	