

**Comprehensive assessment of error correction methods
for high-throughput sequencing data
(Supplementary Document)**

SUPPLEMENTARY METHODS

1. Aligning a Corrected Read to a Reference Sequence

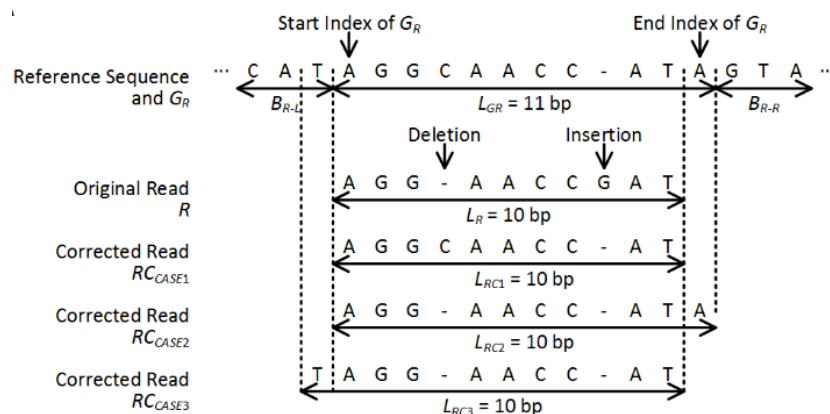


Figure S. An example of taking part of a reference sequence that is compared with a corrected read and aligning reads into it

Let R_C be the corrected version of a read R . In order to evaluate the accuracy of R_C , the number of corrected errors and newly added errors in R_C need to be determined. SPECTACLE first takes the segment G_R from a reference sequence where read R was sampled. The length of G_R , L_{GR} , can be calculated as $L_{GR} = L_R + \langle \text{Number of Deletions in } R \rangle$. The number of deletions in R and the start index of G_R can be found in F_L . In order to get the index where R really ends, L_{GR} should be calculated as $L_{GR} = L_R + \langle \text{Number of Deletions in } R \rangle - \langle \text{Number of Insertions in } R \rangle$ ($RC1$ in Figure 2). However, more bases in the reference sequences are needed if an error correction tool corrects the insertions in R and the tool tries to keep the length of corrected reads the same. B_{R-L} and B_{R-R} , extra bases beside G_R in the reference sequence (Figure 2), should also be recorded because (1) correcting insertions in R can elongate it either to the left or to the right ($RC2$ and $RC3$ in Figure 2), (2) error correction tools may introduce deletions, and (3) some error correction tools can make RC longer than R . The default length of B_{R-L} and B_{R-R} is 10.

Then, R_C is aligned to G_R to find the errors in R_C (errors missed, or introduced by a tool). A modified version of the Gotoh algorithm is used for handling trimmed bases and for extracting all the alignment with the best alignment score.

For finding alignments that have the highest alignment score, three two-dimensional arrays—*ArrayNoGap*, *ArrayGapX*, and *ArrayGapY*—are needed. Let $S[i, j]$ be the substring of string S from the i -th base to the j -th base. Similarly, let $S[i]$ be the i -th base of S . *ArrayNoGap* $[i, j]$ is the best score for all the alignments between $G_R[1, i]$ and $R_C[1, j]$ that do not end with a gap. *ArrayGapX* $[i, j]$ and *ArrayGapY* $[i, j]$ are the best scores for all the alignments between $G_R[1, i]$ and $R_C[1, j]$ that end with a gap in $G_R[i]$ or a gap in $R_C[j]$, respectively. The arrays are filled using the following initial conditions and recurrences where LEN_S is the length of S , LEN_{GR} is the length of G_R , G_M is matching gain, P_M is the mismatch penalty, P_O is the gap opening penalty, and P_E is the gap extension penalty:

$$ArrayNoGap[i, j] = \begin{cases} 0, & i = 0 \text{ and } j = 0 \\ -\infty, & 1 \leq i \leq LEN_{GR} \text{ and } j = 0 \\ -\infty, & i = 0 \text{ and } 1 \leq j \leq LEN_{RC} \\ \max \begin{cases} ArrayNoGap[i-1, j-1] + SC(G_R[i], RC[j]) \\ ArrayGapX[i-1, j-1] + SC(G_R[i], RC[j]) \\ ArrayGapY[i-1, j-1] + SC(G_R[i], RC[j]) \end{cases}, & 1 \leq i \leq LEN_{GR} \text{ and } 1 \leq j \leq LEN_{RC} \end{cases}$$

$$ArrayGapX[i, j] = \begin{cases} -\infty, & i = 0 \text{ and } j = 0 \\ -\infty, & 1 \leq i \leq LEN_{GR} \text{ and } j = 0 \\ 0, & i = 0 \text{ and } 1 \leq j \leq L_R \\ \max \begin{cases} ArrayNoGap[i, j-1] + P_O \\ ArrayGapX[i, j-1] + P_E \\ ArrayGapY[i, j-1] + P_O \end{cases}, & 1 \leq i \leq LEN_{GR} \text{ and } 1 \leq j \leq LEN_{RC} \end{cases}$$

$$ArrayGapY[i, j] = \begin{cases} -\infty, & i = 0 \text{ and } j = 0 \\ 0, & 1 \leq i \leq LEN_{GR} \text{ and } j = 0 \\ -\infty, & i = 0 \text{ and } 1 \leq j \leq LEN_{RC} \\ \max \begin{cases} ArrayNoGap[i-1, j] + P_O \\ ArrayGapX[i-1, j] + P_O \\ ArrayGapY[i-1, j] + P_E \end{cases}, & 1 \leq i \leq LEN_{GR} \text{ and } 1 \leq j \leq LEN_{RC} \end{cases}$$

$$SC(i, j) = \begin{cases} G_M, & i = j \\ P_M, & i \neq j \text{ and } j \in \{A, C, G, T\} \end{cases}$$

G_M , P_M , P_O , and P_E , are all configurable; their default values are $G_M = 1$, $P_M = -4$, $P_O = -6$, and $P_E = -1$ for Illumina reads and $G_M = 1$, $P_M = -1$, $P_O = -1$, and $P_E = -1$ for PacBio reads. These values are the default values of BWA. Gap penalties become 0 at the first and last rows and at the first and last columns. This is needed not to penalize the gaps at the ends of G_R or R_C .

There can be a set of alignments ALN_{BEST} having the same highest alignment score for a read R_C , but each alignment would imply different numbers of corrected and newly introduced errors. In this case, SPECTACLE calculates the penalty of the newly introduced errors in R_C of each alignment utilizing the scores used in the alignment step. Then, the alignment aln_{BEST} from ALN_{BEST} that has the least penalty is chosen. SPECTACLE makes the choice using the following equation, where $ERR(aln)$ and $ERR(R)$ are the sets of errors in an alignment aln and R :

$$aln_{BEST} = \underset{aln \in ALN_{BEST}}{\operatorname{argmax}} \sum_{err \in (ERR(aln) \setminus ERR(R))} \text{penalty}(err)$$

After aln_{BEST} is chosen, it can be determined as to which errors in $ERR(R)$ are corrected and how many errors are newly added during correction.

However, it takes a long time to apply the above algorithm to a large number of TGS reads. Due to their long lengths and high repetition and error rates, the above enumeration step for choosing aln_{BEST} from ALN_{BEST} takes a lot of time and memory, as there might be a large number of best alignments to be enumerated in order to get the alignment with the least penalty. In order to evaluate long TGS reads that have high error rates in a reasonable amount of time, SPECTACLE uses a less complex dynamic programming approach to determine the best alignment score with the least number of new errors and the largest number of corrected errors. The algorithm picks the best alignment between R_C and G_R using only one alignment matrix and simplified gains and penalty scores. A penalty of -1 is assigned for gaps and mismatches. A gain of +1 is assigned for matches. The algorithm has two major dynamic programming steps.

First, evaluate the minimum edit-distance alignment between R_C and G_R that minimizes the number of new errors in R_C with respect to G_R . This can be evaluated using the dynamic programming algorithm defined in Equation (1).

$$Edit[i, j] = \begin{cases} 0, & i = 0 \text{ and } j = 0 \\ 0, & 1 \leq i \leq L_{G_R} \text{ and } j = 0 \\ -j, & i = 0 \text{ and } 1 \leq j \leq L_{R_C} \\ \max \begin{cases} Edit[i-1, j-1] + SC(G_R[i], R_C[j]) \\ Edit[i-1, j] - 1 \\ Edit[i, j-1] - 1 \end{cases}, & 1 \leq i \leq L_{G_R} \text{ and } 1 \leq j \leq L_{R_C} \end{cases}$$

$$SC(i, j) = \begin{cases} +1, & i = j \\ -1, & i \neq j \end{cases} \quad (1)$$

The first column of $Edit[i, j]$ has been initialized to 0 so that the gaps in the initial positions of G_R are not penalized. In order to not penalize gaps in the final positions of G_R , trace back of the matrix to obtain the

best alignment is done starting from the maximum element in the last column of $Edit[i,j]$. Then, from Equation (2), $PredecessorSet_{Edit}(i,j)$ is computed, which defines the previous point in the alignment matrix through which the best alignment for R_C and G_R passes.

$$\begin{aligned}
PredecessorSet_{Edit}(i,j) &\leftarrow \emptyset \\
PredecessorSet_{Edit}(i,j) &\leftarrow PredecessorSet_{Edit}(i,j) \cup (i-1,j-1) \\
&\quad , \text{if } Edit[i-1,j-1] + SC(G_R[i], R_C[j]) = Edit[i,j] \\
PredecessorSet_{Edit}(i,j) &\leftarrow PredecessorSet_{Edit}(i,j) \cup (i-1,j) \\
&\quad , \text{if } Edit[i-1,j]-1 = Edit[i,j] \\
PredecessorSet_{Edit}(i,j) &\leftarrow PredecessorSet_{Edit}(i,j) \cup (i,j-1) \\
&\quad , \text{if } Edit[i,j-1]-1 = Edit[i,j]
\end{aligned} \tag{2}$$

Using $PredecessorSet_{Edit}(i,j)$, the alignment score that introduces the least number of new errors in the read can be computed from the recursion in Equation (3).

$$MinNewErrors(i,j) = \min_{(a,b) \in PredecessorSet_{Edit}(i,j)} \left(MinNewErrors(a,b) + error_{i,j}(a,b) \right) \tag{3}$$

where $error_{i,j}(a,b)$ is defined as shown in Equation (4).

$$\begin{aligned}
&error_{i,j}(a,b) \\
&= \begin{cases} \text{if } a = i-1, b = j-1, \begin{cases} 1, \text{if } (G_R[i] \neq R_C[j]) \text{ and } (G_R[align_{G_R,R}[i]] = R[i] \\ \text{or } align_{G_R,R}[i] = -) \\ 0, \text{otherwise} \end{cases} \\ \text{if } a = i-1, b = j, \begin{cases} 1, align_{G_R,R}[i] \neq - \\ 0, \text{otherwise} \end{cases} \\ \text{if } a = i, b = j-1, \begin{cases} 1, align_{G_R,R}[i] \neq - \\ 0, \text{otherwise} \end{cases} \end{cases}
\end{aligned} \tag{4}$$

Here, $align_{G_R,R}$ is obtained from the alignment of the original read R to the reference region G_R .

It is defined as follows:

$$align_{G_R,R}[i] = \begin{cases} j ; \text{implies base in } R[i] \text{ aligns to refernce } G_R[j] \\ - ; \text{implies base } R[i] \text{ aligns to a gap in } G_R \text{ (insertion in } R) \end{cases} \tag{5}$$

Similarly,

$$align_{R,G_R}[i] = \begin{cases} j ; \text{implies base in } R[i] \text{ aligns to reference } G_R[j] \\ - ; \text{implies base } R[i] \text{ aligns to a gap in } G_R \text{ (insertion in } R) \end{cases} \quad (6)$$

The second step is to find the reads with the maximum number of corrected errors among the corrected reads with the minimum edit distance and minimum number of new errors (computed from Equation (3)). $PredecessorSet_{MinErr}(i,j)$ is computed as follows:

$$\begin{aligned} PredecessorSet_{MinErr}(i,j) &\leftarrow \emptyset \\ PredecessorSet_{MinErr}(i,j) &\leftarrow PredecessorSet_{MinErr}(i,j) \cup (i-1,j-1) \\ &\quad , \text{if } MinNewErrors(i,j) = MinNewErrors(i-1,j-1) + error_{i,j}(i-1,j-1) \\ PredecessorSet_{MinErr}(i,j) &\leftarrow PredecessorSet_{MinErr}(i,j) \cup (i-1,j) \\ &\quad , \text{if } MinNewErrors(i,j) = MinNewErrors(i-1,j) + error_{i,j}(i-1,j) \\ PredecessorSet_{MinErr}(i,j) &\leftarrow PredecessorSet_{MinErr}(i,j) \cup (i,j-1) \\ &\quad , \text{if } MinNewErrors(i,j) = MinNewErrors(i,j-1) + error_{i,j}(i,j-1) \end{aligned} \quad (7)$$

The best read alignment with the minimum number of new errors that also has the maximum number of corrected errors can be obtained using the following recursion:

$$MaxCorrectedErrors(i,j) = \max_{(a,b) \in PredecessorSet_{MinErr}(i,j)} \left(MaxCorrectedErrors(a,b) + corrected_{i,j}(a,b) \right) \quad (8)$$

where,

$$corrected_{i,j}(a,b) = \begin{cases} \text{if } a = i-1, b = j-1, & \begin{cases} 1, & \text{if } R[i] \neq G_R[align_{G_R,R}[i]] \\ 0, & \text{otherwise} \end{cases} \\ 0, & \text{otherwise} \end{cases} \quad (9)$$

$MinNewErrors(L_{RC}, L_{GR})$ gives the number of new errors and $MaxCorrectedErrors(L_{RC}, L_{GR})$ gives the number of corrected errors in the best alignment. Since the identification of the best alignment with minimum new errors and maximum corrected errors are done using dynamic programming recursions, this algorithm takes less time to evaluate TGS reads compared to the

previous algorithm that enumerates all the alignments with the highest score to find the best one in terms of the number of errors corrected.

3. Evaluating the Accuracy of Corrected RNA Sequencing Reads

RNA sequencing reads are generated from mRNA transcripts that do not include introns. The usual size of introns in mammalian genomes varies from 50 to 100,000 bp [1]. Consequently, RNA sequencing reads may be aligned to a DNA reference sequence with large gaps. Hence, the evaluation method used for DNA sequencing reads cannot be used for RNA sequencing reads. Figure S shows how corrected RNA sequencing reads can be evaluated using SPECTACLE. For RNA sequencing data, both simulated reads and real reads can be used for the evaluation flow using SPECTACLE. For the simulated read flow (Figure SA), we used the read simulation flow introduced by Engström, et al. [2]. If locations of transcripts in a target genome and their expression levels are given, BEERS [3] generates error-free reads using this information. These error-free reads are used instead of G_R in later accuracy evaluation flows.

Sequencing errors and quality scores are generated using simNGS (<http://www.ebi.ac.uk/goldman-srv/simNGS>), and they are added to the error-free reads. Since simNGS does not separately provide information regarding the position of the added errors, SPECTACLE should align each of the error-free reads generated using BEERS with the corresponding simNGS output read. The locations of errors in each simNGS output read are then written to F_L .

When real reads are used (Figure SB), the reads should be aligned to a reference sequence using RNA sequencing read alignment tools. The SAM file from the alignment tool can be

converted to F_L by SPECTACLE. SPECTACLE can generate error-free reads when it converts the SAM file into F_L , and the error-free reads are used as G_R in later accuracy evaluation flows.

4. How to down-sample I6

The original *B. cereus* read set from the Illumina website

(http://www.illumina.com/systems/miseq/scientific_data.ilmn) has 2,567 X coverage. It was

down-sampled in order to generate a 40 X coverage read set. Because each read in the original

read set has different read length, we generated 100 bp long paired-end reads by searching the

first 1,086,452 read pairs for reads longer than 100 bp from the beginning of the file and

removing the bases from the end of each read to prune the length down to 100 bp.

SUPPLEMENTARY FIGURES

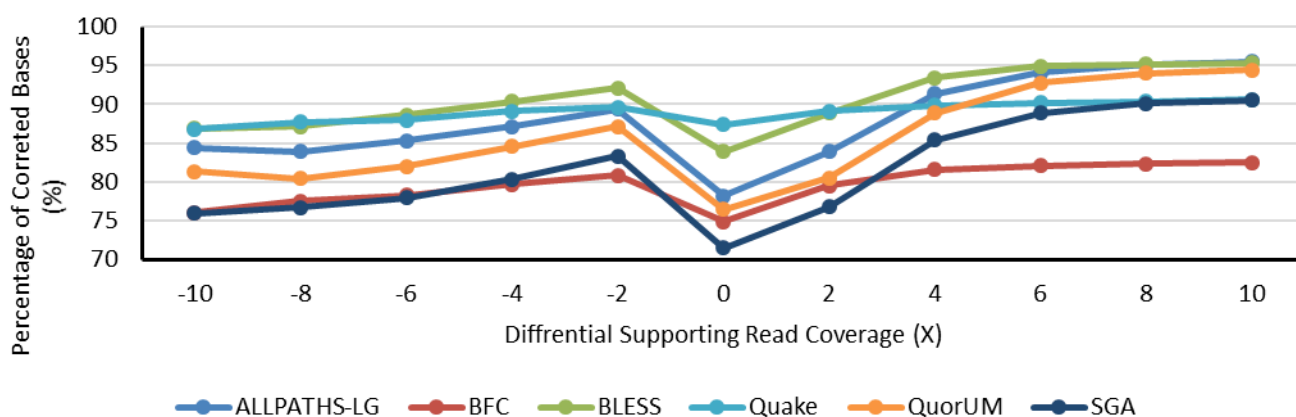
A	Reference	GGAGGGGCGTTTCGCCTCCTACTCGGCGGGT
	<i>R</i>	GGAGGGGCGTTTCGCCTCCTACTC-GCGGGT
	<i>R_C</i>	GGAGGGGCGTTTCGCCTCCTACTCGGCGGG-
B	Reference	<u>GCGCCGGGCGCTGCGGGCGGCGCCC</u> -GATCT
	<i>R</i>	GCGCCGGGCGCTGCGGGCGGCGCCCAGATC-
	<i>R_C</i>	GCGCCGGGCGCTGCGGGCGGCGCCC-GATCT
C	Reference	GGAGGGGCGTTTCGCCTCCTACTCGGCGGGT
	<i>R</i>	GGAGGGGCGTTTCGCCTCCTACTC-GCGGGT
	<i>R_C</i>	GGAGGGGCGTTTCG---C--CTC--C---T

Figure S2. Examples of wrong evaluations made by ECET. [Reference] a part of a reference sequence where *R* is sampled; [*R*] original read (30 bp); [*R_C*] corrected read. (A) *R* has a deletion and it is corrected to *R_C*. The error correction tool removed the last T to keep read length the same. However, "-" at the right end of *R_C* is recognized as an error in ECET. (B) *R* has an insertion A and it is corrected to *R_C*. T at the right end of *R_C* is recognized as an error in ECET, because only the underlined part in Reference is used to evaluate *R_C*. (C) The rightmost 10 bp are trimmed and the error correction tool makes no other modification. However, ECET aligns the trimmed read like *R_C* and recognizes the trimmed bases as new errors even though the trimmed read has no error.

A	Reference	TTTTTTTTTTTTTTTTTTTTTGC GTTAACTTCGTGAAATTTTTTTTTTTTTTTTTT
	<i>R</i>	TTTTTTTTTTTTTTTTTTTTTGC GTTTGAAATTTTTTTTTTTTTTTTTT
	<i>R_C</i>	TTTTTTTTTTTTTTTTTTTTTGC T TTGAAATTTTTTTTTTTTTTTTTT
B	Reference	TTTTTTTTTTTTTTTTTTTTTGC GTTAACTTCGTGAAATTTTTTTTTTTTTT
	<i>R</i>	TTTTTTTTTTTTTTTTTTTTTGC G-----TT--TGAAATTTTTTTTTTTTTT
C	Reference	TTTTTTTTTTTTTTTTTTTTTGC GTTAACTTCGTGAAATTTTTTTTTTTTTT
	<i>R_C</i>	-----TTTTTTTTTTTTTTTT TTT TCCTT --TGAAATTTTTTTTTTTTTT

Figure S3. Example of a wrong evaluation made by compute_gain. (A) [*R*] read before error correction; [*R_C*] read after error correction. The twenty-third base G is changed to C. In compute_gain, the matching score is 0, the mismatch penalty is -1,000, and the gap penalty is -1,001. The affine gap penalty is not used, and the gaps at the ends of reads are not penalized. (B) Alignment result of *R* made by compute_gain. The seven gaps are recognized as errors. (C) Alignment result of *R_C* made by compute_gain. Even though only one base in *R* is changed, a totally new alignment is made because of the scoring system in compute_gain.

A



B

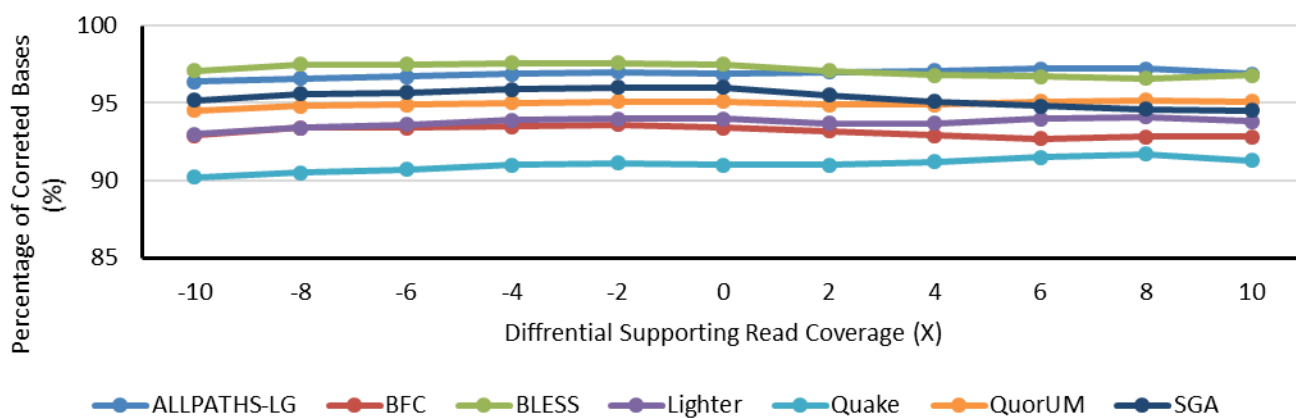


Figure S4. (A) The percentage of corrected errors in I5-10X for various differential supporting read coverages. (B) The percentage of corrected errors in I5-40X for various differential supporting read coverages.

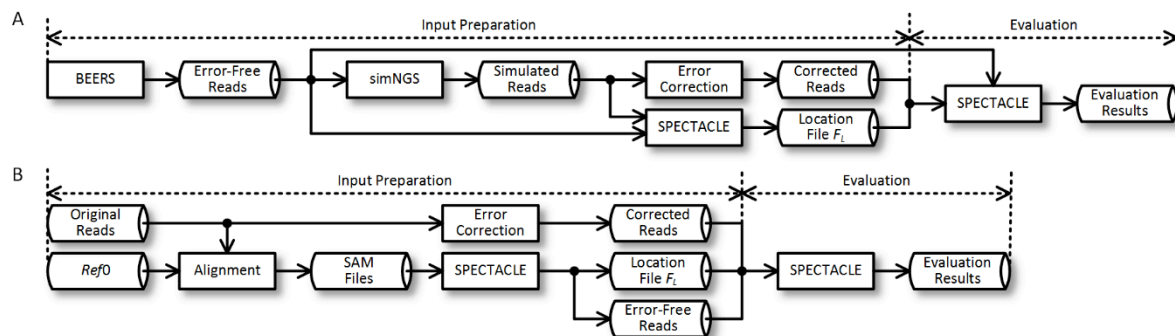


Figure S5. The flowchart of evaluating corrected RNA sequencing reads using SPECTACLE. (A) The evaluation flow for simulated reads. (B) The evaluation flow for real reads.

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TMP1/1 1 gi|42779081|ref|NC_003909.8| - 4156442 100 35:A->C;60:A->C; - -
TMP2/2 1 gi|42779081|ref|NC_003909.8| + 4156114 100 - 90:ACC -

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Figure S6. Example lines of an error location file.

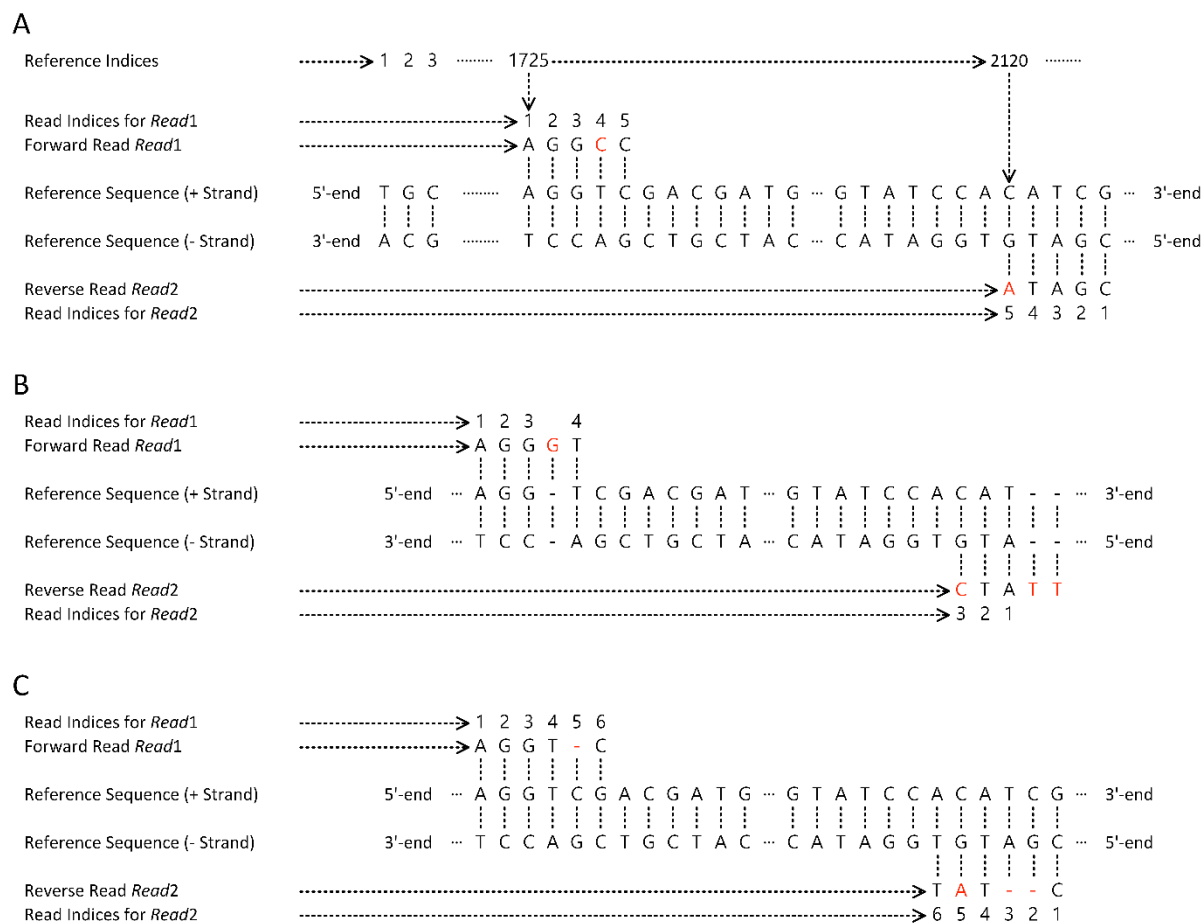


Figure S7. Examples for the start index, locations of substitutions, insertions, and deletions.

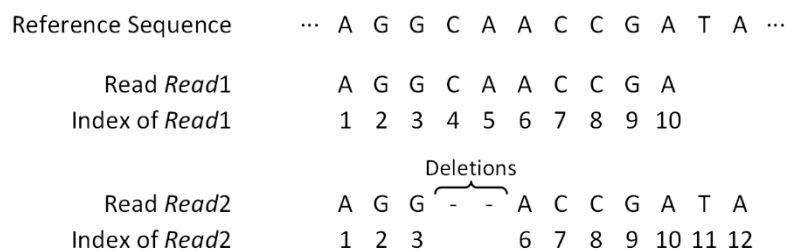


Figure S8. Example of error positions in reads.

DETAILED INFORMATION ON INPUT READ SETS

1. I1-I6

Genome		Reference Sequence				Read									
Name	Accession #	Genome Length (bp)			GC Contents (%)	Read Length	Coverage	Identifier	# of Reads	# of Bases	Insert Length	# of Erroneous Bases			Error Rate (%)
		Original	A	B								Substitution	Insertion	Deletion	
R. sphaeroids	NC_007488.1	4,602,949	4,603,062	4,602,682	69	100	10	I1-10X	460,272	46,027,200	400	163,549	341	607	0.36
	NC_007489.1						20	I1-20X	920,560	92,056,000	400	328,072	600	1,213	0.36
	NC_007490.1						30	I1-30X	1,380,846	138,084,600	400	491,697	918	1,835	0.36
	NC_007493.1						40	I1-40X	1,841,136	184,113,600	400	652,204	1,244	2,474	0.36
B. cereus	NC_003909.8	5,432,652	5,431,364	5,429,371	36	100	10	I2-10X	543,374	54,337,400	400	203,224	357	704	0.38
	NC_005707.1						20	I2-20X	1,086,750	108,675,000	400	408,837	678	1,444	0.38
							30	I2-30X	1,630,128	163,012,800	400	612,733	1,070	2,149	0.38
							40	I2-40X	2,173,506	217,350,600	400	815,879	1,371	2,943	0.38
O. sativa Chr.5	NC_008398.2	29,867,513	29,867,597	29,866,862	44	100	10	I3-10X	2,986,720	298,672,000	400	1,111,794	1,994	4,011	0.37
							20	I3-20X	5,973,444	597,344,400	400	2,223,114	3,942	7,970	0.37
							30	I3-30X	8,960,166	896,016,600	400	3,332,063	6,023	11,885	0.37
							40	I3-40X	11,946,890	1,194,689,000	400	4,442,460	8,078	15,923	0.37
Mouse Chr.Y	NC_000087.7	88,124,698	88,122,779	88,123,044	39	100	10	I4-10X	8,812,290	881,229,000	400	3,293,449	5,889	11,966	0.38
							20	I4-20X	17,624,580	1,762,458,000	400	6,590,129	11,691	23,535	0.38
							30	I4-30X	26,436,872	2,643,687,200	400	9,882,375	17,623	35,499	0.38
							40	I4-40X	35,249,162	3,524,916,200	400	13,176,985	23,556	47,238	0.38
Human Chr.1	NC_000001.11	230,481,012	230,478,179	230,473,579	42	100	10	I5-10X	23,048,422	2,304,842,200	400	8,585,787	14,869	30,677	0.37
							20	I5-20X	46,096,848	4,609,684,800	400	17,174,514	30,596	61,916	0.37
							30	I5-30X	69,145,274	6,914,527,400	400	25,762,742	45,716	92,746	0.37
							40	I5-40X	92,193,698	9,219,369,800	400	34,349,899	60,744	123,573	0.37
B. cereus	NC_003909.8 NC_005707.1	5,432,551	N/A	N/A	36	100	40	I6	2,172,904	217,290,400	550	488,708	1,073	3,721	0.23

2. P1-P2

Genome		Reference Sequence			Read																				
Name	Accession Number	Genome Length (bp)		GC Contents (%)	Identifier	Read Length	Coverage	# of Reads	# of Bases	PacBio		# of Erroneous Bases in Aligned Reads				Illumina									
		Original	No N							Number	Percent	Substitution	Insertion	Deletion	Error Rate (%)	Identifier	Accession Number	Read Length	Coverage	# of Reads	# of Bases	Substitution	Insertion	Deletion	Rate (%)
E. coli	NC_000913.3	4,641,652	4,641,652	51	P1	500-14,494	21	31,226	97,448,943	29,844	96	725,949	6,764,938	2,674,034	23.4	P1-110X	SRR922409	97	0	478,520	46,416,440	294,852	1,078	4,665	0.6
																P1-120X	SRR922409	97	0	957,040	92,832,880	537,890	1,991	9,819	0.6
																P1-130X	SRR922409	97	0	1,435,560	139,249,320	789,143	5,405	14,950	0.6
																P1-140X	SRR922409	97	0	1,914,080	185,665,760	1,088,909	6,621	19,485	0.6
Human Chr19	NC_000019.10	10,000,000	10,000,000	48	P2	500-15,000	20	67,009	200,000,000	67,009	100	4,369,940	23,006,553	13,200,809	20.3	P2-110X	N/A	100	0	5,844,074	584,407,400	2,154,517	3,861	7,910	0.4
																P2-120X	N/A	100	0	11,688,150	1,168,815,000	4,314,507	7,802	15,737	0.4
																P2-130X	N/A	100	0	17,532,226	1,753,222,600	6,465,979	11,389	23,500	0.4
																P2-140X	N/A	100	0	23,376,302	2,337,630,200	8,621,835	15,298	15,298	0.4
																P2-140X-EF	N/A	100	0	23,376,302	2,337,630,200	0	0	0	0.0

SUPPLEMENTARY RESULTS

1. Accuracy

1.1 I1

Coverage (%)	Software	Substitution												Insertion												Deletion												Trimmed Base
		YIN	NYT	NYT	MIN	MIN	S to D	NYN IN	Sensitivity (Recall)	Gain	Precision	Specificity	F-score	YIN	NYT	NYN	MIN	NYN IN	Sensitivity (Recall)	Gain	Precision	F-score	YIN	NYT	MIN	MIN	NYN IN	Sensitivity (Recall)	Gain	Precision	F-score							
30	ALPAPHIS-6	1.155	45,857.715	149,743	0	0	0	0.915	0.884	0.964	1.000	0.940	0.940	0	0	0	0	0	0.989	0.987	1.000	0.942	0	0	0	0	0	0.999	0.947	0.999	0.999	0						
	BIC	5.566	45,857.451	150,026	0	0	0	0.922	0.887	0.964	1.000	0.943	0.943	10	13	83	263	0	0.038	-0.176	0.513	0.861	33	42	0	0	0	0.060	0.010	0.540	0.540	0						
	BIS	1.203	45,754.013	159,650	1	0	0	0.933	0.973	0.964	1.000	0.962	0.962	17	21	80	233	40	0.044	0.065	0.935	0.947	33	54	0	0	0	0.034	0.011	0.916	0.916	0						
	Blue	16.185	45,846.424	152,743	0	0	0	0.934	0.934	0.903	1.000	0.910	0.910	14	303	3	33	0	0.889	0.827	0.930	0.911	120	534	0	0	0	0.910	0.723	0.933	0.865	430						
	Coral	12.852	45,852.022	159,571	0	0	0	0.934	0.889	0.925	1.000	0.930	0.930	3,015	340	39	330	0	0.724	-10.763	0.603	0.316	440	588	0	0	0	0.963	0.280	0.576	0.376	727						
	DCMO	45.317	45,854.412	151,051	0	0	0	0.925	0.776	0.913	1.000	0.945	0.945	10	2	120	0	0	0.025	-0.113	0.405	0.606	10	0	0	0	0	0.031	0.011	0.405	0.405	0						
	Flora	9.983	45,854.060	161,251	0	0	0	0.983	0.980	0.984	1.000	0.971	0.942	281	313	2	24	0	0.924	0.003	0.976	0.930	881	571	0	0	0	0.941	0.461	0.962	0.777	158						
	HTTC	54.748	45,807.888	151,493	0	0	0	0.937	0.603	0.716	0.999	0.825	0.818	218	23	28	23	0	0.842	0.125	0.539	0.637	421	141	0	0	0	0.893	0.109	0.543	0.493	0						
	Lighter	909	45,854.060	159,650	0	0	0	0.983	0.983	0.983	1.000	0.983	0.983	909	909	909	909	909	0.983	0.983	0.983	0.983	909	909	909	909	909	0.983	0.983	0.983	0.983	909						
	Market	1.488	45,851.506	159,880	0	0	0	0.978	0.968	0.992	1.000	0.984	0.984	13	24	84	213	0	0.970	0.218	0.984	0.932	22	48	0	0	0	0.970	0.043	0.984	0.943	0						
	Master	1.014	45,816.992	159,650	0	0	0	0.978	0.968	0.992	1.000	0.984	0.984	13	24	84	213	0	0.970	0.218	0.984	0.932	22	48	0	0	0	0.970	0.043	0.984	0.943	0						
	QuantM	2.051	45,878.116	157,613	0	0	0	0.983	0.983	0.983	1.000	0.983	0.983	2,051	2,051	2,051	2,051	2,051	0.983	0.983	0.983	0.983	2,051	2,051	2,051	2,051	2,051	0.983	0.983	0.983	0.983	2,051						
	RACR	186.850	45,715.636	141,230	0	0	0	0.876	0.023	0.493	0.997	0.631	0.631	83	350	0	41	0	0.880	0.625	0.375	0.824	153	532	0	0	0	0.882	0.630	0.378	0.827	0						
	Shuttle	20.430	45,853.533	144,188	0	0	0	0.862	0.815	0.920	1.000	0.905	0.905	136	313	39	330	0	0.611	0.051	0.321	0.379	236	792	0	0	0	0.644	0.161	0.373	0.406	0						
	SEA	18.841	45,861.085	154,754	10	0	0	0.940	0.941	0.980	1.000	0.967	0.913	13	50	92	339	0	0.344	-0.044	0.462	0.336	20	152	0	0	0	0.361	0.234	0.390	0.413	0						
	SDWyu	3.534	45,859.540	161,940	0	0	0	0.936	0.674	0.967	1.000	0.767	0.767	0	0	0	0	0	0.000	0.000	NA	NA	0.000	0	0	0	0	0.000	0.000	NA	NA	0.000						
	Towel	1.127	45,852.823	154,851	0	0	0	0.920	0.905	0.980	1.000	0.933	0.933	0	0	0	0	0	0.000	0.000	NA	NA	0.000	0	0	0	0	0.000	0.000	NA	NA	0.000						
30	ALPAPHIS-6	6.127	91,718.242	325,531	0	0	0	0.993	0.997	0.997	1.000	0.994	0.994	0	0	0	0	0	0.997	0.973	1.000	0.991	0	0	0	0	0	0.997	0.983	0.999	0.999	0						
	BIC	1.754	91,724.975	315,420	0	0	0	0.962	0.956	0.994	1.000	0.977	0.977	26	34	91	475	0	0.957	-0.142	0.922	0.990	89	99	0	0	0	0.982	0.008	0.999	0.999	0						
	BIS	1.103	91,648.013	326,397	0	0	0	0.993	0.993	0.993	1.000	0.996	0.996	0	0	0	0	0	0.994	0.993	0.993	0.993	0	0	0	0	0	0.994	0.993	0.993	0.993	0						
	Blue	16.270	91,711.383	325,756	0	0	0	0.993	0.949	0.957	1.000	0.970	0.970	22	586	4	10	0	0.977	0.933	0.938	0.967	53	2,209	0	0	0	0.997	0.993	0.999	0.997	631						
	Coral	25.030	91,709.670	317,993	0	0	0	0.993	0.953	0.938	1.000	0.953	0.953	11,621	496	27	177	0	0.927	-18.920	0.940	0.977	853	1,884	0	0	0	0.976	0.270	0.980	0.728	1,580						
	DCMO	17.131	91,705.574	293,186	0	0	0	0.894	0.811	0.945	1.000	0.916	0.916	13	894	43	19	0	0.964	0.015	0.932	0.922	14	183	0	0	0	0.976	0.024	0.982	0.948	0						
	Flora	8.893	91,715.940	326,852	133	0	0	0.985	0.985	0.970	1.000	0.983	0.983	254	457	18	23	0	0.929	0.020	0.979	0.779	280	1,182	0	0	0	0.976	0.744	0.989	0.884	837						
	HTTC	20.652	91,763.175	324,751	0	0	0	0.900	0.810	0.924	1.000	0.973	0.973	254	457	83	49	0	0.763	0.021	0.444	0.393	404	910	0	0	0	0.805	0.068	0.373	0.413	0						
	Lighter	1.121	91,719.164	318,243	0	0	0	0.970	0.947	0.977	1.000	0.975	0.975	1	33	1	684	0	0.940	0.040	0.992	0.994	11	634	0	0	0	0.950	0.040	0.994	0.994	0						
	Market	2.92	91,726.379	320,370	110	0	0	0.977	0.975	0.999	1.000	0.988	0.988	14	44	171	383	0	0.971	-0.231	0.932	0.936	17	93	0	0	0	0.977	0.048	0.998	0.715	0.339						
	Master	1.022	91,725.984	321,541	40	0	0	0.987	0.983	0.996	1.000	0.992	0.992	1	510	0	86	0	0.915	0.023	0.997	0.960	4	641	0	0	0	0.977	0.822	0.999	0.999	0.903						
	QuantM	0.003	91,641.228	326,490	0	0	0	0.997	0.997	0.997	1.000	0.994	0.994	0	0	0	0	0	0.994	0.994	0.994	0.994	0	0	0	0	0	0.994	0.994	0.994	0.994	0						
	RACR	180.370	91,623.110	322,190	0	0	0	0.983	0.670	0.716	0.999	0.816	0.816	129	594	0	0	0	0.984	0.769	0.819	0.895	227	1,199	0	0	0	0.989	0.801	0.999	0.999	0.968						
	Shuttle	19.424	91,714.241	305,140	0	0	0	0.989	0.989	0.989	1.000	0.993	0.993	0	0	0	0	0	0.974	0.177	0.949	0.947	601	950	0	0	0	0.994	0.764	0.999	0.999	0.961						
	SEA	420	91,726.089	325,160	23	0	0	0.993	0.990	0.999	1.000	0.990	0.990	9	170	142	288	0	0.283	0.032	0.330	0.360	21	320	0	0	0	0.264	0.247	0.338	0.412	0						
40	ALPAPHIS-6	1.155	45,857.715	149,743	0	0	0	0.915	0.884	0.964	1.000	0.940	0.940	0	0	0	0	0	0.989	0.987	1.000	0.942	0	0	0	0	0	0.999	0.947	0.999	0.999	0						
	BIC	5.566	45,857.451	150,026	0	0	0	0.922	0.887	0.964	1.000	0.943	0.943	10	13	83	263	0	0.038	-0.176	0.513	0.861	33	42	0	0	0	0.060	0.010	0.540	0.540	0						
	BIS	1.203	45,754.013	159,650	1	0	0	0.933	0.973	0.964	1.000	0.962	0.962	17	21	80	233	40	0.044	0.065	0.935	0.947	33	54	0	0	0	0.034	0.011	0.916	0.916	0						
	Blue	16.185	45,846.424	152,743	0	0	0	0.934	0.934	0.903	1.000	0.910	0.910	14	303	3	33	0	0.889	0.827	0.930	0.911	120	534	0	0	0	0.910	0.723	0.933	0.865	430						
	Coral	12.852	45,852.022	159,571	0	0	0	0.934	0.889	0.925	1.000	0.930	0.930	3,015	340	39	330	0	0.724	-10.763	0.603	0.316	440	588	0	0	0	0.963	0.280	0.576	0.376	727						
	DCMO	45.317	45,854.412	151,051	0	0	0	0.925	0.776	0.913	1.000	0.945	0.945	10	2	120	0	0	0.025	-0.113	0.405	0.606	10	0	0	0	0	0.031	0.011	0.405	0.405	0						
	Flora	9.983	45,854.060	161,251	0	0	0	0.983	0.980	0.984	1.000	0.971	0.942	281	313	2	24	0	0.924	0.003	0.976	0.930	881	571	0	0	0	0.941	0.461	0.962	0.777	158						
	HTTC	54.748	45,807.888	151,493	0	0	0	0.937	0.603	0.716	0.999	0.825	0.818	218	23	28	23	0	0.842	0.125	0.539	0.637	421	141	0	0	0	0.893	0.109	0.543	0.493	0						
	Lighter																																					

1.2 I2

ID	Software	Substitution												Insertion												Deletion												Trimmed Base																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		YYN	YYN	YYN	NNN	NNN	S1D	NYTR	Sensitivity(Recall)	Gain	Precision	Specificity	Fscore	YYN	NYN	NNN	NNN	NYTR	Sensitivity(Recall)	Gain	Precision	Fscore	YYN	NYN	NNN	NNN	NYTR	Sensitivity(Recall)	Gain	Precision	Fscore																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
ALPATS-16	ALPATS-16	0.542	54.092.350	192.221	11	10.912	0	0	0.940	0.911	0.961	1.000	0.956	0	211	0	140	0	0.600	0.600	1.000	0.758	0	381	0	117	0	0.550	0.548	0.997	0.709	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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ID	Software	Substitution												Insertion												Deletion												Trimmed Base	
		YYN	YYN	YYN	NNN	NNN	S1SD	YYTTR	Sensitivity(Recall)	Gain	Precision	Specificity	F-score	YYN	YYN	NNN	NNN	WYTR	Sensitivity(Recall)	Gain	Precision	F-score	YYN	YYN	NNN	NNN	WYTR	Sensitivity(Recall)	Gain	Precision	F-score								
A	ALPATS-ID	70.746	297.478,070	1,039,440	1,941	11,173	0	0	0.935	0.885	0.930	1.000	0.933	534	1,190	0	804	0	0.507	0.570	0.657	0.735	144	2,151	0	1,854	0	0.533	0.534	0.594	0.698	0	0	0	0	0	0		
	BTC	49,812	297,505,319	992,180	11,212	106,475	11	0	0.907	0.888	0.942	1.000	0.937	153	145	440	1,349	0	0.681	0.221	0.211	0.117	404	1,589	0	1,473	0	0.510	0.510	0.510	0.510	0	0	0	0	0	0		
	BLISS	139,911	296,703,307	1,056,804	0	41,933	7	33,086	0.933	0.933	0.933	1.000	0.973	713	1,877	149	1,913	0	0.914	0.716	0.716	0.716	318	1,659	0	1,659	0	0.901	0.901	0.901	0.901	0	0	0	0	0	0		
	Blue	206,202	297,344,033	1,036,423	2,863	72,403	101	38	0.932	0.742	0.831	0.999	0.870	309	1,730	0	213	0	0.889	0.738	0.688	0.667	1,332	1,327	0	484	0	0.870	0.547	0.728	0.793	2,913	0	0	0	0	0	0	
	Conv	179	297,512,654	821,171	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
	Flow	110,917	297,442,214	863,994	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
	Flow	180,933	297,448,008	1,081,784	5,840	24,364	130	137	0.973	0.875	0.908	1.000	0.940	2,024	1,811	24	139	0	0.918	0.109	0.109	0.109	6,824	2,111	0	210	0	0.941	0.609	0.839	0.761	4,097	0	0	0	0	0	0	
	ITREC	537,561	297,255,288	1,013,288	0	42,821	0	0	0.933	0.933	0.933	1.000	0.973	1,401	1,801	284	1,401	0	0.918	0.109	0.109	0.109	6,824	2,111	0	210	0	0.941	0.609	0.839	0.761	4,097	0	0	0	0	0	0	
	Lighter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Market	20,879	297,335,149	1,031,581	2,249	15,811	11	0	0.948	0.927	0.979	1.000	0.963	89	193	499	1,304	0	0.506	0.199	0.245	0.139	274	470	0	1,513	0	0.110	0.010	0.635	0.200	0	0	0	0	0	0		
B	Quake	10,567	295,247,801	1,002,280	0	49,240	2	103,984	0.933	0.933	0.933	1.000	0.970	7	1,609	1	1,091	0	0.801	0.005	0.007	0.042	17	1,687	0	1,126	0	2,610	0.997	0.889	2,409,317	0	0	0	0	0	0		
	QuartzID	118,280	296,257,344	1,004,311	5,944	42,463	8	22,223	0.935	0.880	0.880	1.000	0.923	249	1,894	1	17	66	0.911	0.840	0.880	0.928	164	870	0	149	0	2,382	0.977	0.961	0.985	0.981	1,188,801	0	0	0	0	0	0
	RACN	2,383,457	295,245,757	996,340	5,937	110,057	8	0	0.893	1.110	0.903	0.992	0.931	2,445	1,786	37	151	0	0.903	0.513	0.430	0.572	2,316	2,426	0	933	0	0.910	0.331	0.630	0.712	0	0	0	0	0	0		
	Reggie	1384,181	297,376,307	953,978	1,310	156,269	17	0	0.838	0.691	0.817	0.999	0.847	913	1,739	104	139	0	0.660	0.180	0.370	0.627	2,047	2,710	0	677	0	0.810	0.163	0.576	0.618	0	0	0	0	0	0		
	SEA	26,456	297,529,006	1,021,144	680	89,928	33	0	0.919	0.884	0.974	1.000	0.946	307	1,700	438	896	0	0.280	0.018	0.018	0.018	1,368	1,056	0	2,943	0	0.260	0.235	0.897	0.418	0	0	0	0	0	0		
	Flow	26,456	297,512,654	821,171	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
	Flow	26,456	297,512,654	821,171	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
	Flow	26,456	297,512,654	821,171	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
	Flow	26,456	297,512,654	821,171	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
	Flow	26,456	297,512,654	821,171	0	269,821	0	484	0.933	0.933	0.933	1.000	0.973	25,212	1,776	171	213	0	0.904	0.217	0.217	0.217	6,815	2,064	0	1,589	0	0.870	0.870	0.870	0.870	0	0	0	0	0	0		
C	ALPATS-ID	82,718	295,027,084	2,188,881	1,961	12,274	1	0	0.983	0.847	0.963	1.000	0.974	306	1,354	3	733	0	0.843	0.787	0.809	0.884	52	1,134	0	1,836	0	0.770	0.763	0.802	0.867	0	0	0	0	0	0		
	BTC	20,826	295,000,206	2,000,962	26,360	12,281	12	0	0.956	0.926	0.964	1.000	0.926	346	1,349	31	1,349	0	0.909	0.568	0.534	0.534	1,133	1,230	0	674	0	0.844	0.654	0.834	0.738	0	0	0	0	0	0		
	BLISS	235,791	294,185,443	2,185,465	0	17,171	17	10,304	0.983	0.973	0.983	1.000	0.986	710	1,720	10	205	236	0.948	0.774	0.844	0.893	330	7,381	0	880	0	0.944	0.914	0.951	0.955	945,950	0	0	0	0	0	0	
	Blue	239,910	294,868,707	2,165,288	4,281	13,504	44	82	0.974	0.864	0.899	1.000	0.939	273	1,653	28	261	0	0.927	0.856	0.829	0.928	600	7,453	0	533	0	0.933	0.846	0.925	0.924	924,417	0	0	0	0	0	0	
	Conv	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	Flow	144,417	294,968,042	1,935,757	1,367	286,424	8	10	0.871	0.805	0.930	1.000	0.899	81	183	52	1,707	0	0.046	0.010	0.018	0.086	171	402	0	2,568	0	0.050	0.029	0.702	0.094	0	0	0	0	0	0		
	Flow	189,208	294,916,811	2,181,951	14,518	26,554	145	337	0.927	0.899	0.923	1.000	0.951	1,120	1,711	61	164	0	0.943	0.134	0.139	0.139	6,861	2,921	0	7,939	0	0.960	0.509	0.725	0.628	7,100	0	0	0	0	0	0	
	ITREC	313,817	294,795,300	2,172,180	12,817	98,247	40	0	0.977	0.840	0.869	1.000	0.920	2,887	1,349	410	179	0	0.844	0.013	0.004	0.631	5,724	2,201	0	760	0	0.904	0.186	0.517	0.088	0	0	0	0	0	0		
	Lighter	79,692	295,033,319	2,123,107	840	98,160	2	0	0.915	0.919	0.944	1.000	0.950	599	1,113	40	1,580	0	0.979	0.039	0.065	0.142	388	729	0	7,241	0	0.092	0.049	0.683	0.161	0	0	0	0	0	0		
	Market	86,947	295,051,368	2,152,791	0	65,647	14	0	0.969	0.974	0.989	1.000	0.979	289	1,029	2,499	0	0.168	0.009	0.010	0.149	388	729	0	7,241	0	0.092	0.049	0.683	0.161	0	0	0	0	0	0			
	Quake	95,316	293,878,881	2,151,884	809	10,811	2	0	0.971	0.965	0.995	1.000	0.983	418	1,791	791	5,180	0	0.909	0.895	0.907	0.942	23	5,413	0	2,553	0	0.901	0.807	0.998	0.991	3,986,613	0	0	0	0	0	0	
D	QuartzID	118,280	296,257,344	1,004,311	5,944	42,463	8	22,223	0.935	0.880	0.880	1.000	0.923	249	1,894	1	17	66	0.911	0.840	0.880	0.928	164	870	0	149	0	2,382	0.977	0.961	0.985	0.981	1,188,801	0	0	0	0	0	0
	RACN	2,383,457	295,245,757	996,340	5,937	110,057	8	0	0.893	1.110	0.903	0.992	0.931	2,445	1,786	37	151	0	0.903	0.513	0.430	0.572	2,316	2,426	0	933	0	0.910	0.331	0.630	0.712	0	0	0	0	0	0		
	Reggie	1384,181	297,376,307	953,978	1,310	156,269	17	0	0.838	0.691	0.817	0.999	0.847	913	1,739	104	139	0	0.660	0.180	0.370	0.627	2,047	2,710	0	677	0	0.810	0.163	0.576	0.618	0	0	0	0	0	0		
	SEA	26,456	297,529,006																																				

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ID	Software	Substation												Insulator												Detention												Trimmed Base	
		YYN	YYN	YYN	NNN	NNN	S10	YYNTR	Sensitivity(Recall)	Gain	Precision	Specificity	Fscore	YYN	YYN	NNN	NNN	Sensitivity(Recall)	Gain	Precision	Fscore	YYN	YYN	NNN	NNN	Sensitivity(Recall)	Gain	Precision	Fscore	YYN	YYN	NNN	NNN	Sensitivity(Recall)	Gain	Precision	Fscore		
10	ALPAPHS-LD	576,574	877,344,093	2,846,112	14,943	452,480	27	0	0.864	0.685	0.828	0.898	0.846	491	2,270	54	1,555	0	0.387	0.296	0.830	0.524	698	4,371	0	0.589	0	0.367	0.807	0.862	0.515	0							
	BTC	598,096	877,822,729	2,520,399	115,215	457,440	5	0	0.765	0.699	0.859	1.000	0.808	0.810	4,952	775	2,492	0	0.129	0.210	0.942	0.188	2,004	2,215	0	0.945	0	0.229	0.915	0.517	0.912	0							
	BLISS	275,579	899,309,896	2,759,181	6,313	358,877	107	447,591	0.853	0.781	0.920	1.000	0.886	6,510	4,999	79	1,120	0.814	0.217	0.436	0.568	4,984	8,331	0	0.791	0.933	0.792	0.774	8,705,813	0									
	Blue	1,234,141	876,683,809	2,789,874	25,137	474,161	77	39	0.848	0.680	0.889	0.999	0.761	932	1,424	44	2,221	0	0.615	0.451	0.789	0.692	2,488	6,972	0	0.494	0	0.583	0.375	0.777	0.631	2,281	0						
	Conv	0	877,853,461	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0									
	ECHO	0	877,853,461	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0									
	Flow	788,942	877,334,112	2,048,528	158,241	887,030	7,660	717	0.830	0.281	0.845	0.999	0.837	21,611	1,584	122	463	0	0.801	0.469	0.175	0.287	29,118	18,736	0	1,230	0	0.897	-1.583	0.388	0.413	16,474	0						
	ITREC	1,230,648	876,883,018	2,574,949	158,480	379,729	0	0	0.863	0.680	0.867	0.999	0.761	932	1,424	44	2,221	0	0.615	0.451	0.789	0.692	2,488	6,972	0	0.494	0	0.583	0.375	0.777	0.631	2,281	0						
	Lighter	0	877,853,461	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0									
	Market	378,530	877,344,119	2,513,871	29,360	759,179	46	0	0.783	0.642	0.863	1.000	0.810	573	1,043	1,361	2,481	0	0.177	0.187	0.130	0.211	2,112	2,777	0	0.719	0	0.221	0.951	0.564	0.315	0							
10	Quake	176,161	860,641,311	2,675,167	2,701	451,261	22	842,584	0.811	0.801	0.964	1.000	0.897	1,101	4,508	0	1,151	0.881	0.864	0.980	0.920	131	7,481	0	4,120	7,481	0.771	0.878	0.878	17,034,101	0								
	QuantUM	422,960	876,016,051	2,733,536	30,862	538,927	124	84,110	0.831	0.698	0.860	1.000	0.847	1,809	5,480	45	893	181	0.901	0.727	0.819	0.877	895	11,024	0	942	6,741	0.900	0.904	0.994	0.904	2,953,851	0						
	RACN	1,139,412	874,702,383	2,424,464	14,588	1,026,212	71	0	0.785	0.250	0.411	0.996	0.513	8,110	4,430	484	724	0	0.793	0.712	0.340	0.481	9,900	9,948	0	1,943	0	0.837	0.001	0.580	0.626	0							
	Reggie	595,535	877,355,171	2,499,249	5,327	1,058,838	48	0	0.683	0.510	0.798	0.999	0.736	2,343	3,305	739	2,624	0	0.304	0.108	0.439	0.414	5,316	5,433	0	6,539	0	0.817	0.001	0.511	0.482	0							
	SEA	1,277,179	877,595,290	2,321,450	5,842	968,051	4	0	0.701	0.624	0.875	1.000	0.743	243	1,064	84	4,741	0	0.741	0.125	0.765	0.292	401	2,148	0	9,848	0	0.177	0.144	0.841	0.292	0							
	Tron	288,667	877,715,402	1,574,274	4,864	1,124,777	1	0	0.477	0.111	0.622	1.000	0.554	114	1,111	729	1,594	0	0.413	0.027	0.659	0.659	584	0	0	0.000	0.000	0.000	0.000	0									
	ALPAPHS-LD	1,020,886	1,754,807,034	5,718,953	28,576	884,582	42	0	0.884	0.707	0.844	0.999	0.856	1,058	5,022	120	1,543	0	0.450	0.329	0.838	0.562	1,392	9,655	0	13,866	0	0.441	0.362	0.874	0.558	0							
	BTC	510,955	1,755,958,888	5,846,530	359,338	5,020,323	58	0	0.815	0.628	0.877	1.000	0.840	1,078	5,480	1,360	8,941	0	0.177	0.068	0.368	0.388	4,806	5,570	0	14,261	0	0.224	0.926	0.575	0.318	0							
	Blue	440,364	1,739,000,503	5,768,332	10,020	816,474	164	915,851	0.881	0.849	0.935	1.000	0.913	10,512	9,772	171	1,749	1,004	0.849	0.027	0.507	0.635	6,953	16,951	0	4,381	7,136	0.851	0.629	0.793	0.822	17,21,754	0						
	BLISS	2,106,940	1,755,727,902	5,520,962	49,495	1,028,563	198	46	0.838	0.513	0.719	0.999	0.774	1,135	7,122	111	4,457	0	0.669	0.469	0.817	0.686	3,679	13,651	0	8,884	0	0.580	0.424	0.788	0.668	3,075	0						
10	Conv	41	1,755,884,250	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0									
	ECHO	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0									
	Flow	1,850,301	1,753,936,251	4,807,112	768,726	1,486,815	17,236	1,845	0.615	0.217	0.621	0.999	0.638	61,071	10,911	207	493	0	0.935	0.414	0.151	0.261	65,106	23,990	0	1,543	0	0.934	-1.813	0.211	0.396	90,164	0						
	ITREC	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0	0	0	0	0.000	0.000	0.000	0.000	0									
	Lighter	443,108	1,755,898,368	4,694,850	29,267	1,865,969	87	0	0.712	0.641	0.909	1.000	0.799	1,578	2,038	802	8,811	0	0.174	0.029	0.461	0.213	4,513	5,591	0	17,944	0	0.230	0.046	0.513	0.312	0							
	Market	490,079	1,755,951,718	5,037,742	44,464	1,507,713	76	0	0.764	0.683	0.904	1.000	0.818	1,581	2,038	2,686	4,979	0	0.174	0.029	0.461	0.213	4,513	5,591	0	17,944	0	0.230	0.046	0.513	0.312	0							
	Quake	245,705	1,724,184,381	5,362,861	4,700	1,709,679	86	1,709,679	0.853	0.812	0.964	1.000	0.906	4,891	5,181	171	2,317	9,037	0	0.764	0.083	0.907	0.907	760	16,393	0	8,163	16,393	0.761	0.961	0.971	871	32,980,821	0					
	QuantUM	451,449	1,732,212,746	5,211,531	63,014	1,511,401	219	104,429	0.784	0.717	0.912	1.000	0.840	1,678	10,111	89	1,081	107	0.902	0.738	0.848	0.873	1,541	20,821	0	2,714	13,830	0.920	0.883	0.958	0.941	3,395,124	0						
	RACN	4,701,518	1,751,902,781	4,141,601	56,300	2,417,511	155	0	0.620	0.098	0.464	0.999	0.516	15,106	4,841	1,499	1,499	0	0.714	0.061	0.348	0.460	18,408	18,174	0	4,191	0	0.821	0.011	0.210	0.010	0							
	Reggie	898,041	1,754,943,049	4,479,503	8,004	2,101,150	77	0	0.680	0.541	0.832	1.000	0.748	5,055	1,501	1,497	4,821	0	0.459	0.105	0.611	0.475	11,701	12,882	0	11,149	0	0.524	0.039	0.514	0.020	0							
10	SEA	449,358	1,755,348,442	4,746,107	5,995	1,816,010	9	0	0.713	0.647	0.905	1.000	0.804	1,571	2,788	104	3,301	0	0.188	0.142	0.704	0.313	887	4,454	0	16,881	0	0.190	0.160	0.848	0.320	0							
	Tron	290,456	1,755,284,178	4,121,766	1,811	1,485,517	24	0	0.674	0.414	0.810	1.000	0.627	812	236	248	0	0.026	0.027	0.126	0.08	1,316	1,371	0	12,160	0	0.000	0.001	0.908	0.001	0								
	Flow	795,613	1,755,116,108	4,003,691	10,863	2,575,351	98	0	0.608	0.499	0.840	1.000	0.768	1,848	2,676	812	8,188	0	0.248	0.013	0.514	0.316	1,146	1,146	0	1,324	0	0.201	0.088	0.644	0.327	0							
	ALPAPHS-LD	1,133,203	2,633,277,030	5,512,985	48,700	1,524,933	15	0	0.861	0.702	0.844	0.999	0.852	1,426	7,551	102	5,871	0	0.420	0.114	0.789	0.536	2,111	14,919	0	16,878	0	0.417											

1.5 IS

ID	Software	Substitution												Insertion												Deletion												Trimmed Base
		YYN	YYN	YYN	NNN	NNN	S10D	YYTN	Sensitivity(Recall)	Gain	Precision	Specificity	Fscore	YYN	YYN	NNN	NNN	WPTTR	Sensitivity(Recall)	Gain	Precision	Fscore	YYN	YYN	NNN	NNN	WPTTR	Sensitivity(Recall)	Gain	Precision	Fscore	YYN	YYN	NNN	NNN			
A	ALPAPHS-1d	846,022	2,295,287,569	7,821,111	10,389	754,583	0	0	0.811	0.801	0.800	1.000	0.906	379	8,341	24	4,484	0	0.562	0.541	0.885	0.700	585	15,731	0	14,934	0	0.513	0.487	0.989	0.871	0	0	0	0	0		
	BTC	468,041	2,229,814,869	6,956,181	16,438	1,568,040	222	0	0.811	0.810	0.810	1.000	0.866	1,561	1,499	3,099	10,111	0	0.688	0.221	0.288	0.139	4,388	4,545	0	26,112	0	0.891	0.908	0.933	0.911	0	0	0	0	0		
	BLES	289,064	2,288,537,581	7,971,089	6,869	867,469	122	278,964	0.810	0.809	0.806	1.000	0.948	9,719	13,789	52	3,550	1,003	0.851	0.289	0.398	0.716	3,713	3,713	0	13,226	0	0.891	0.813	0.915	0.892	7,578,133	0	0	0	0	0	
	Blue	1,334,808	2,294,783,205	7,278,005	19,124	1,287,754	903	451	0.848	0.850	0.843	0.999	0.846	1,442	12,030	95	2,744	0	0.807	0.705	0.887	0.846	9,038	25,087	0	5,190	0	0.810	0.524	0.738	0.775	20,712	0	0	0	0	0	
	Coval	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	ECHO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Etina	858,850	2,295,241,180	6,808,075	43,887	451,166	1,843	1,327	0.847	0.847	0.837	0.905	1.000	9,221	22,015	11,450	265	1,154	0	0.801	0.633	0.758	0.526	26,689	28,199	0	2,278	0	0.920	0.282	0.378	0.712	16,881	0	0	0	0	0
	INTEC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Lighter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Market	237,719	2,295,952,814	7,614,633	17,376	913,704	72	0	0.889	0.889	0.968	1.000	0.927	1,075	1,589	3,446	9,723	0	0.108	0.203	0.312	0.217	3,395	3,913	0	26,744	0	0.129	0.055	0.623	0.215	0	0	0	0	0		
B	Quake	199,011	2,176,321,561	7,901,881	5,377	878,725	82	963,811	0.808	0.807	1.000	0.946	0.911	1,757	1,757	441	13,443	0	0.881	0.868	0.861	0.929	417	13,819	0	18,838	0	0.773	0.898	0.875	0.895	20,000,003	0	0	0	0	0	
	QuantUM	690,514	2,380,975,005	6,633,541	30,838	896,182	236	183,424	0.884	0.815	0.951	1.000	0.904	3,374	13,503	22	1,844	444	0.911	0.696	0.899	0.857	1,373	27,736	0	2,802	18,987	0.941	0.915	0.975	0.961	6,954,923	0	0	0	0	0	
	RACN	26,587,572	2,289,571,082	7,030,702	67,745	1,486,495	136	0	0.813	2.287	0.209	0.988	0.333	23,720	12,476	285	1,599	0	0.830	0.803	0.842	0.491	20,388	25,957	0	7,713	0	0.870	0.188	0.560	0.683	0	0	0	0	0		
	Regilla	1,645,545	2,294,481,613	6,913,986	19,379	1,857,609	83	0	0.853	0.812	0.807	0.999	0.806	4,241	9,940	810	4,395	0	0.691	0.123	0.839	0.664	3,980	19,705	0	18,939	0	0.681	0.533	0.871	0.658	0	0	0	0	0		
	SEA	456,167	2,395,720,805	7,318,222	6,433	1,258,948	180	0	0.852	0.803	0.945	1.000	0.896	835	4,118	2,310	8,531	0	0.277	0.072	0.574	0.374	1,029	7,884	0	22,685	0	0.870	0.227	0.886	0.402	0	0	0	0	0		
	Tron	547,295	2,295,766,762	5,526,695	5,604	5,526,695	45	0	0.867	0.866	0.855	1.000	0.720	167	167	24,698	0	0.603	0.012	0.623	0.022	154	738	0	25,958	0	0.604	0.001	0.604	0.000	0	0	0	0	0	0		
	Tronv	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	ALPAPHS-1d	1,330,583	4,580,921,861	16,562,889	17,222	389,331	18	0	0.964	0.888	0.925	1.000	0.844	1,046	24,244	43	6,283	0	0.783	0.765	0.855	0.866	1,278	46,708	0	15,152	0	0.755	0.734	0.879	0.858	0	0	0	0	0		
	BTC	480,516	4,590,886,264	16,786,466	45,481	5,208,679	18	0	0.958	0.873	0.926	1.000	0.846	3,266	5,688	6,328	16,679	0	0.214	0.224	0.288	0.277	32,807	14,640	0	48,488	0	0.213	0.055	0.528	0.266	0	0	0	0	0		
	Blue	250,378	4,586,956,506	16,461,576	5,426	877,251	133	209,444	0.961	0.946	0.984	1.000	0.972	7,044	27,463	48	3,985	783	0.960	0.974	0.799	0.847	3,514	54,381	0	7,325	22,765	0.911	0.874	0.961	0.935	5,086,739	0	0	0	0	0	
C	BLES	1,428,260	4,590,818,678	15,316,463	28,455	1,788,397	304	567	0.894	0.809	0.913	1.000	0.908	2,455	26,294	187	4,113	0	0.859	0.773	0.809	0.883	4,808	53,778	0	8,137	0	0.860	0.789	0.925	0.892	29,628	0	0	0	0	0	
	Coval	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	ECHO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Etina	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	INTEC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Lighter	871,612	4,591,406,798	15,770,410	12,374	1,991,302	23	0	0.918	0.887	0.947	1.000	0.912	914	2,324	884	27,968	0	0.976	0.036	0.954	0.116	2,077	8,234	0	16,693	0	0.084	0.011	0.716	0.113	0	0	0	0	0		
	Market	964,624	4,591,911,882	15,547,019	36,422	1,945,998	113	0	0.907	0.883	0.979	1.000	0.919	3,319	4,444	7,488	15,649	0	0.133	0.207	0.268	0.157	4,961	1,974	0	15,584	0	0.129	0.049	0.673	0.273	0	0	0	0	0		
	Quake	136,454	4,593,184,741	15,651,658	8,499	1,563,986	134	1,818,896	0.913	0.910	0.993	1.000	0.913	913	21,608	99	4,271	0	0.906	0.881	0.979	0.927	887	45,913	0	11,651	39,338	0.786	0.778	0.898	0.876	32,817,822	0	0	0	0	0	
	QuantUM	732,516	4,587,702,518	16,322,830	63,875	778,420	180	288,031	0.952	0.897	0.951	1.000	0.955	3,768	29,780	51	785	164	0.974	0.813	0.889	0.930	1,599	60,027	0	1,880	49,237	0.987	0.966	0.985	0.983	8,180,013	0	0	0	0	0	
	RACN	24,177,854	4,578,860,513	16,424,091	69,132	1,877,724	166	0	0.898	0.124	0.596	0.607	0.344	43,746	23,027	881	1,713	0	0.948	0.164	0.388	0.551	13,247	14,991	0	1,541	0	0.945	0.163	0.615	0.753	0	0	0	0	0		
D	Regilla	2,395,406	4,589,851,183	14,922,818	23,011	2,224,381	167	0	0.961	0.748	0.861	1.000	0.865	9,213	23,760	973	1,841	0	0.777	0.464	0.700	0.737	20,676	45,565	0	14,297	0	0.771	0.403	0.688	0.711	0	0	0	0	0		
	SEA	416,978	4,591,858,548	16,110,974	5,912	1,887,405	21	0	0.941	0.917	0.975	1.000	0.938	468	9,070	979	20,847	0	0.284	0.299	0.888	0.445	1,752	16,993	0	45,653	0	0.273	0.261	0.937	0.425	0	0	0	0	0		
	Tron	547,441	4,592,563,563	16,682,138	5,320	4,488,906	58	0	0.823	0.826	0.988	1.000	0.761	817	139	6,961	0	0.018	0.010	0.120	0.000	1,251	1,290	0	69,628	0	0.001	0.001	0.508	0.006	0	0	0	0	0	0	0	
	Tronv	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	ALPAPHS-1d	1,788,059	6,888,582,572	24,935,103	24,979	863,568	17	0	0.968	0.897	0.912	1.000	0.950	2,005	38,188	87	7,515	0	0.834	0.789	0.848	0.888	2,081	73,757	0	18,880	0	0.790	0.775	0.934	0.876	0	0	0	0	0		
	BTC	375,581	6,888,041,751	23,929,717	54,243	1,787,489	1886																															

1.6 I6

Software	Substitution													Insertion													Deletion													Trimmed Base
	YYN	YYN	YYN	NTN	NNN	S.D.D	NYT	TR	Sensitivity (Recall)	Gain	Precision	Specificity	F-score	YYN	NYT	NTN	NNN	NYT	TR	Sensitivity (Recall)	Gain	Precision	F-score	YYN	NYT	NTN	NNN	NYT	TR	Sensitivity (Recall)	Gain	Precision	F-score							
ALLPATHS-LG	668	212,565,390	468,964	48	19,696	0	0	0.965	0.958	0.999	1.000	0.979	15	422	0	651	0	0.193	0.181	0.930	0.560	0	1,141	0	970	0	0.844	0.843	0.999	0.915	0									
BBC	486	212,566,317	479,183	195	0	0	0.981	0.979	0.999	1.000	0.990	0	13	190	0	871	0	0.177	0.135	0.809	0.291	304	0	1,162	0	0.150	0.069	0.648	0.244	0										
BELLS	927	212,497,580	479,253	48	19,392	5	1.383	0.979	0.977	0.998	1.000	0.988	138	427	-2	444	10	0.407	0.297	0.787	0.384	41	1,134	0	107	1,376	0.885	0.877	0.991	0.918	81,094									
Blue	17,798	212,528,590	480,092	866	7,747	3	0	0.982	0.903	0.994	1.000	0.953	23	443	-2	628	0	0.411	0.390	0.947	0.575	354	0	1,367	0	0.905	0.896	0.990	0.946	211										
Canal	1,092	212,565,950	399,211	28	89,468	1	0	0.917	0.856	0.983	1.000	0.904	11,886	206	13	854	0	0.162	-10.851	0.817	0.015	189	0	1,051	0	0.821	0.773	0.944	0.879	351										
CCNO	4,552	212,562,061	406,180	38	82,476	16	0	0.911	0.821	0.989	1.000	0.903	66	193	-2	897	0	0.158	0.090	0.888	0.257	897	1,730	0	1,391	0	0.465	0.187	0.634	0.317	0									
CCNO	1,848	212,564,910	474,137	162	14,392	17	2	0.970	0.967	0.997	1.000	0.981	139	397	-1	670	0	0.370	0.221	0.713	0.487	314	3,209	0	512	0	0.862	0.778	0.911	0.886	281									
CCNO	2,769	212,563,763	471,980	258	14,829	31	0	0.963	0.944	0.999	1.000	0.976	141	408	0	650	0	0.380	0.240	0.713	0.500	2,147	3,668	0	612	0	0.873	0.748	0.909	0.857	0									
CCNO	1,182	212,565,171	475,651	76	12,973	2	0	0.973	0.971	0.997	1.000	0.985	64	168	0	905	0	0.157	0.142	0.913	0.251	24	403	0	3,118	0	0.108	0.045	0.194	0	0									
CCNO	1,054	212,565,003	467,880	247	20,482	10	0	0.959	0.955	0.997	1.000	0.977	31	110	11	952	0	0.103	0.060	0.760	0.179	111	417	0	3,364	0	0.112	0.082	0.790	0.186	0									
CCNO	867	212,684,076	464,488	66	144,100	0	61,300	0.728	0.756	0.987	1.000	0.848	14	140	0	928	128	0.222	0.159	0.779	0.348	46	1,880	0	1,865	0	0.788	0.662	0.884	0.793	114,487	984,640								
CCNO	2,477	212,555,542	476,957	238	9,113	2	46,431	0.982	0.977	0.993	1.000	0.988	38	400	0	623	107	0.449	0.424	0.944	0.660	41	3,080	0	785	1,804	0.945	0.917	0.993	0.968	526,416									
CCNO	9,767	212,566,579	472,472	257	15,868	23	0	0.967	0.946	0.979	1.000	0.973	89	446	0	627	0	0.418	0.322	0.818	0.551	281	3,418	0	388	0	0.917	0.842	0.924	0.921	0									
CCNO	10,320	212,566,134	416,487	155	10,845	21	0	0.952	0.881	0.975	1.000	0.910	109	348	1	723	0	0.324	0.218	0.773	0.453	1,394	3,613	0	1,840	0	0.718	0.570	0.679	0.665	0									
CCNO	1,414	212,566,515	463,941	85	15,621	55	0	0.967	0.944	0.997	1.000	0.972	29	180	5	888	0	0.168	0.145	0.876	0.281	27	1,042	0	2,679	0	0.280	0.261	0.935	0.431	0									
CCNO	282	212,566,534	283,246	37	225,422	3	0	0.539	0.538	0.999	1.000	0.708	39	30	1	1,842	0	0.028	0.009	0.080	0.051	37	88	0	3,641	0	0.022	0.008	0.584	0.042	0									
CCNO	920	212,565,513	330,830	29	157,460	1	0	0.671	0.673	0.987	1.000	0.806	21	140	0	923	0	0.139	0.118	0.871	0.246	44	571	0	3,158	0	0.154	0.143	0.929	0.263	0									

1.7 P1

Illumina Coverage (X)	Software	Trimmed	Original Reads						Corrected Reads					
			Total Read Length w/ Gaps	# of Matched Bases	Percent Similarity (%)	Coverage	NG50	# of Reads	Total Read Length w/ Gaps	# of Matched Bases	Percent Similarity (%)	Coverage	NG50	# of Reads
10	LoRDEC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	17,223,025	16,936,891	98.3	4.0	1,397	23,819
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	91,177,025	78,753,754	86.4	20.1	9,684	31,144
	LSC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	77,249,770	67,120,771	86.9	16.8	9,214	27,459
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	91,429,371	76,841,677	84.0	20.0	9,678	30,066
	PBcR	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	15,468,845	15,348,694	99.2	3.4	1,489	18,588
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Proovread	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	26,010,603	25,480,709	98.0	5.8	1,996	30,217
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	61,968,324	55,495,147	89.6	13.6	9,175	19,246
	LoRDEC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	56,286,834	55,265,324	98.2	12.5	3,644	49,718
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	89,185,985	79,745,238	89.4	19.8	9,521	31,108
	LSC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	78,718,895	68,831,520	87.4	17.2	9,217	28,000
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	91,284,291	77,310,121	84.7	20.0	9,640	30,275
30	PBcR	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	34,409,354	34,101,825	99.1	7.5	3,148	32,835
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	48,356,424	47,180,406	97.6	10.8	5,170	32,075
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	61,645,442	56,179,066	91.1	13.6	9,044	19,603
	LoRDEC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	66,156,747	64,933,397	98.2	14.6	5,324	45,673
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	88,738,268	80,265,833	90.5	19.7	9,492	31,098
40	LSC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	79,837,640	70,069,701	87.8	17.4	9,204	28,359
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	91,209,097	77,635,424	85.1	20.0	9,601	30,403
	PBcR	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	41,537,570	41,140,449	99.0	9.0	3,932	36,399
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	51,485,113	50,194,344	97.5	11.5	6,537	28,166
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	61,250,522	56,071,178	91.5	13.5	9,102	19,324
50	LoRDEC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	69,028,964	67,703,139	98.1	15.2	5,979	43,334
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	88,587,127	80,049,578	90.4	19.7	9,473	31,101
	LSC	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	79,955,725	70,185,179	87.8	17.5	9,212	28,404
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	91,209,727	77,663,429	85.1	20.0	9,594	30,423
	PBcR	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	44,383,390	43,936,011	99.0	9.6	4,267	37,448
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60	Proovread	Trimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	37,652,531	36,698,385	97.5	8.4	5,994	20,704
		Untrimmed	97,908,974	75,005,455	76.6	21.0	10,050	31,226	44,768,043	41,031,663	91.7	9.9	8,690	14,018

1.8 P2

Illumina Coverage (X)	Software	Trimmed	Original Reads						Corrected Reads					
			Total Read Length w/ Gaps	# of Matched Bases	Percent Similarity (%)	Coverage	NG50	# of Reads	Total Read Length w/ Gaps	# of Matched Bases	Percent Similarity (%)	Coverage	NG50	# of Reads
10	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	38,058,908	37,385,823	98.2	3.8	1,814	42,376
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	196,051,818	176,513,067	90.0	19.3	11,644	66,920
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	73,465,223	69,689,034	94.9	7.3	1,655	89,748
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	130,821,759	130,464,282	99.7	13.1	6,121	77,968
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	148,199,423	146,891,063	99.1	14.8	10,769	52,721
20	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	49,028,777	48,316,045	98.5	4.9	2,476	47,474
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	195,234,653	177,300,025	90.8	19.3	11,592	66,916
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	125,275,036	114,985,782	91.8	12.4	2,871	122,693
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	167,825,015	167,342,350	99.7	16.8	8,293	76,739
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	177,368,001	176,374,956	99.4	17.7	11,087	63,280
30	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	47,871,303	47,225,606	98.7	4.8	2,620	44,900
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	195,152,973	177,437,548	90.9	19.3	11,603	66,915
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	153,477,724	136,847,196	89.2	15.2	3,908	127,889
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	141,111,424	140,702,809	99.7	14.1	8,472	60,833
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	147,996,431	147,268,182	99.5	14.8	10,703	52,731
40	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	51,180,684	50,500,731	98.7	5.1	2,737	47,687
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	195,155,573	177,439,110	90.9	19.3	11,599	66,913
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	169,669,898	148,233,414	87.4	16.8	4,762	126,530
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	150,505,015	150,065,869	99.7	15.0	8,541	65,089
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	157,768,617	156,996,404	99.5	15.8	10,807	56,294
40 (Error-free)	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	52,612,261	51,883,517	98.6	5.3	2,984	46,916
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	195,141,123	177,491,160	91.0	19.3	11,587	66,914
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	167,012,903	147,058,972	88.1	16.5	4,605	127,244
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	131,791,956	131,371,371	99.7	13.2	8,413	56,493
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	138,219,230	137,515,199	99.5	13.8	10,372	49,400

1.9 PacBio Mouse ChrY 10 Mbp

Illumina Coverage (X)	Software	Trimmed	Original Reads						Corrected Reads					
			Total Read Length w/ Gaps	# of Matched Bases	Percent Similarity (%)	Coverage	NG50	# of Reads	Total Read Length w/ Gaps	# of Matched Bases	Percent Similarity (%)	Coverage	NG50	# of Reads
10	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	115,637,423	108,996,824	94.3	11.5	3,257	108,477
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	192,369,983	175,448,463	91.2	19.0	11,440	66,870
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	139,212,695	134,393,059	96.5	13.9	3,524	126,141
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	145,275,882	144,426,317	99.4	14.5	9,724	56,195
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	148,001,870	146,911,906	99.3	14.8	10,544	52,838
20	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	119,552,991	112,610,127	94.2	11.9	3,383	109,437
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	192,276,432	175,504,733	91.3	19.0	11,438	66,868
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	161,156,216	155,190,345	96.3	16.1	4,846	120,172
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	165,202,166	164,358,203	99.5	16.5	10,264	62,058
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	167,530,570	166,467,631	99.4	16.7	10,866	59,900
30	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	117,343,625	110,659,290	94.3	11.7	3,377	108,377
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	192,316,895	175,522,863	91.3	19.0	11,434	66,868
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	155,517,952	154,789,586	99.5	15.5	10,046	58,496
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	157,738,038	156,818,150	99.4	15.7	10,735	56,395
40	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	117,874,784	111,141,528	94.3	11.7	3,390	108,556
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	192,302,017	175,532,158	91.3	19.0	11,436	66,865
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	174,702,160	173,884,904	99.5	17.4	10,411	65,683
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	184,508,185	183,443,045	99.4	17.7	11,082	63,321
40 (Error-free)	LoRDEC	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	120,436,235	113,414,342	94.2	12.0	3,440	109,597
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	192,257,541	175,502,855	91.3	19.0	11,430	66,869
	LSC	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PBcR	Trimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Untrimmed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Proovread	Trimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	136,071,521	135,450,831	99.5	13.6	9,873	51,264
		Untrimmed	213,200,809	169,386,778	79.4	20.0	12,095	67,009	138,215,782	137,417,034	99.4	13.8	10,532	49,221

2. Sensitivity vs Supporting Read Coverage

2.1 I1-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HiTEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	35.4	39.8	68.1	39.4	52.3	29.7	75.2	33.5	N/A	69.0	82.8	50.0	18.6	47.7	41.1	25.0	1.0
1	53.8	58.8	79.7	55.8	73.9	43.1	89.4	50.7	N/A	84.3	90.2	69.1	32.2	63.2	60.9	37.9	1.1
2	66.2	73.6	89.5	70.2	88.2	56.4	96.5	66.9	N/A	93.8	93.7	80.7	48.0	74.5	75.1	47.3	1.4
3	77.9	84.0	94.1	81.4	95.3	67.5	98.1	80.8	N/A	97.1	95.7	89.8	63.1	81.2	85.6	56.2	1.8
4	85.5	89.5	96.5	88.6	97.3	76.4	98.9	89.0	N/A	98.2	96.8	94.2	75.1	85.9	91.7	60.9	2.6
5	88.8	92.1	97.5	91.4	98.3	80.7	98.9	92.9	N/A	98.5	97.2	96.5	81.9	87.2	94.3	62.7	3.1
6	92.4	94.1	98.0	94.4	98.8	85.0	99.0	96.1	N/A	98.5	97.5	97.9	87.5	89.2	95.9	65.0	4.5
7	93.6	95.2	98.6	96.2	99.2	87.5	99.0	97.9	N/A	98.6	97.8	98.8	91.7	89.6	97.3	65.5	4.6
8	95.5	95.5	98.9	97.4	99.3	88.7	99.3	98.7	N/A	98.8	97.9	99.2	94.7	90.4	97.8	66.0	5.2
9	96.4	95.5	99.0	98.3	99.4	90.0	99.1	99.1	N/A	98.7	98.1	99.5	96.5	91.0	98.1	66.9	5.5
10	97.2	95.7	99.2	98.5	99.5	91.3	99.2	99.5	N/A	98.9	98.2	99.7	98.0	91.7	99.0	66.2	6.5
11	98.1	96.4	99.2	99.2	99.3	91.6	99.2	99.7	N/A	98.9	98.2	99.7	98.6	91.8	99.1	67.4	7.0
12	98.1	96.3	98.9	99.4	99.5	92.3	99.1	99.8	N/A	98.4	98.3	99.8	99.1	91.8	99.1	67.2	7.7
13	98.9	96.8	98.8	99.3	99.7	93.2	99.2	99.8	N/A	98.6	98.2	99.9	99.6	92.5	99.1	67.3	8.7
14	99.1	95.9	98.9	99.7	99.6	92.7	99.1	99.9	N/A	98.5	98.0	99.9	99.7	92.4	99.3	67.5	9.8
15	98.9	96.1	99.0	99.7	99.6	93.0	99.3	99.8	N/A	98.7	98.0	99.8	99.6	92.5	99.3	66.6	10.4
16	99.0	95.9	99.0	99.8	99.8	92.6	99.4	99.9	N/A	98.4	98.0	99.9	99.8	92.2	99.3	68.1	11.3
17	99.4	96.3	98.8	99.6	99.8	90.5	99.4	99.9	N/A	98.4	97.9	99.8	99.7	91.5	99.6	66.6	13.5
18	98.9	96.1	98.5	99.8	99.6	89.3	98.9	99.9	N/A	97.9	97.9	99.9	99.8	92.4	99.4	67.0	15.0
19	99.3	97.2	98.8	99.7	99.4	88.9	99.3	99.9	N/A	98.7	98.0	100.0	99.8	92.6	99.4	68.7	15.4
20	99.8	96.4	99.0	100.0	99.8	87.5	99.6	99.8	N/A	98.4	97.6	99.8	99.8	90.9	99.5	67.2	20.0

2.2 I1-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HiTEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	59.7	59.7	63.9	61.1	59.7	45.8	83.3	31.9	22.2	77.8	88.9	58.3	25.0	50.0	59.7	37.5	19.4
1	74.9	78.5	77.9	74.3	68.8	55.2	95.0	56.4	41.4	91.7	87.0	81.5	43.4	79.3	79.0	50.3	28.5
2	85.0	86.1	88.6	85.1	84.1	68.2	97.6	73.0	55.6	97.1	93.5	90.4	59.9	86.1	87.2	58.8	35.1
3	91.0	90.2	91.9	89.8	85.4	77.0	98.8	83.3	66.7	97.4	94.7	94.0	72.8	89.0	92.7	60.3	38.6
4	94.8	93.8	95.7	95.3	89.5	83.3	99.2	91.2	77.9	97.6	97.1	97.7	83.5	91.8	95.6	64.6	42.9
5	96.3	95.1	97.5	97.0	92.2	87.0	99.3	94.9	84.4	97.9	97.4	98.5	90.1	92.9	97.4	65.3	44.7
6	97.9	95.6	98.2	97.7	93.1	90.5	99.5	96.5	88.6	97.9	98.0	99.1	93.2	94.0	98.3	65.7	49.3
7	98.3	96.1	99.1	98.7	94.1	92.4	99.5	97.8	91.2	98.2	98.5	99.5	95.7	94.2	98.7	66.3	51.0
8	98.9	96.5	99.6	99.0	95.2	94.0	99.7	98.7	93.9	98.3	98.7	99.8	97.0	94.6	99.3	66.8	54.7
9	99.0	96.1	99.6	99.2	95.7	94.6	99.6	99.1	95.4	98.1	98.3	99.7	97.9	95.1	99.1	66.7	56.2
10	99.1	96.3	99.5	99.4	96.0	95.1	99.5	99.3	96.3	98.1	98.6	99.8	98.6	94.7	99.3	66.7	58.2
11	99.4	96.2	99.8	99.6	96.5	95.4	99.6	99.4	97.2	98.0	98.7	99.9	99.0	95.0	99.3	67.2	59.9
12	99.4	96.3	99.7	99.5	96.4	95.4	99.6	99.5	97.7	97.9	98.7	99.8	99.3	94.9	99.4	66.7	60.2
13	99.4	96.1	99.7	99.6	96.7	95.2	99.5	99.6	98.3	97.9	98.6	99.8	99.4	95.1	99.4	66.5	62.1
14	99.6	96.2	99.8	99.7	96.8	95.0	99.5	99.7	98.5	98.0	98.9	99.9	99.6	94.7	99.5	66.5	62.6
15	99.6	96.7	99.8	99.7	97.1	94.9	99.7	99.7	98.7	98.0	98.8	99.9	99.6	95.5	99.4	67.9	63.1
16	99.7	96.1	99.8	99.7	97.3	94.7	99.7	99.7	99.0	97.6	98.9	99.9	99.7	95.4	99.4	66.7	63.4
17	99.7	96.6	99.8	99.7	97.3	94.7	99.7	99.8	99.2	97.8	98.9	99.9	99.7	94.9	99.5	67.8	65.4
18	99.6	96.1	99.7	99.8	97.6	93.8	99.7	99.7	99.3	97.7	98.8	99.9	99.8	95.0	99.5	66.5	66.0
19	99.8	96.4	99.9	99.8	97.7	93.9	99.6	99.8	99.6	97.8	98.8	99.9	99.8	94.9	99.5	67.4	66.1
20	99.7	96.1	99.8	99.7	98.1	93.5	99.7	99.8	99.4	97.4	98.6	99.9	99.8	94.6	99.5	67.1	67.7

2.3 I1-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	60.0	60.0	86.7	60.0	60.0	40.0	80.0	33.3	40.0	66.7	93.3	60.0	20.0	60.0	46.7	33.3	20.0
1	87.8	84.9	81.1	82.4	76.7	41.9	100.0	47.3	39.2	95.9	91.9	93.2	32.4	84.9	64.9	47.3	27.0
2	89.9	89.0	88.6	90.8	82.0	62.7	96.9	68.4	58.8	93.9	96.5	94.3	53.1	90.4	78.5	57.5	30.3
3	93.9	92.5	93.2	91.8	84.0	71.1	99.6	79.0	74.3	96.6	96.8	95.7	72.2	90.6	89.7	61.1	36.4
4	97.3	94.0	97.1	96.5	86.6	82.0	99.1	91.5	86.0	98.2	98.0	98.1	84.4	93.8	95.4	62.1	40.7
5	97.6	95.4	97.9	98.2	89.1	84.2	99.3	94.6	90.1	99.3	98.5	99.3	89.4	94.3	95.9	64.7	44.7
6	98.6	95.8	98.9	98.8	90.8	89.2	99.6	96.2	93.3	99.2	97.9	99.4	93.1	94.9	97.8	65.8	47.7
7	98.9	96.4	99.2	99.2	93.0	92.6	99.5	97.5	95.5	99.6	98.6	99.6	95.5	95.6	98.4	67.3	51.6
8	99.4	96.1	99.5	99.3	93.7	92.7	99.5	98.0	96.6	99.4	98.6	99.7	96.8	95.2	98.8	65.8	54.0
9	99.4	96.3	99.7	99.6	94.2	94.4	99.7	98.8	97.6	99.4	98.7	99.8	97.7	96.2	99.1	66.2	57.7
10	99.5	96.1	99.8	99.7	95.0	94.9	99.6	99.3	98.2	99.5	98.7	99.8	98.7	96.2	99.4	66.3	60.7
11	99.5	96.6	99.7	99.8	95.7	95.8	99.6	99.4	98.6	99.5	98.8	99.8	99.0	95.9	99.4	66.7	61.9
12	99.6	96.5	99.8	99.8	96.1	96.2	99.6	99.4	98.9	99.4	98.8	99.8	99.3	96.4	99.5	67.7	64.1
13	99.6	96.7	99.8	99.7	96.4	96.1	99.6	99.5	99.1	99.5	98.7	99.8	99.4	96.2	99.4	65.8	65.3
14	99.7	96.2	99.8	99.8	96.8	95.8	99.7	99.5	99.2	99.5	98.8	99.8	99.4	96.3	99.4	66.4	66.4
15	99.7	96.3	99.8	99.7	97.0	95.8	99.7	99.6	99.3	99.5	98.8	99.8	99.6	96.2	99.5	66.9	68.3
16	99.8	96.2	99.8	99.8	97.1	95.3	99.6	99.7	99.4	99.6	98.5	99.8	99.7	96.2	99.7	67.7	68.6
17	99.8	96.0	99.9	99.8	97.2	94.4	99.7	99.7	99.5	99.5	98.8	99.8	99.6	95.6	99.6	66.0	69.2
18	99.8	96.2	99.9	99.9	97.3	93.4	99.7	99.7	99.5	99.6	98.6	99.9	99.7	96.0	99.6	66.8	70.3
19	99.7	96.3	99.8	99.8	97.6	92.5	99.7	99.8	99.4	99.5	98.6	99.8	99.7	95.9	99.6	67.2	71.0
20	99.7	96.4	99.8	99.8	97.4	91.7	99.7	99.7	99.5	99.6	98.7	99.8	99.7	95.7	99.6	66.8	71.3

2.4 I1-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	50.0	100.0	50.0	50.0	100.0	0.0	100.0	0.0	0.0	50.0	50.0	100.0	0.0	0.0	0.0	50.0	0.0
1	80.0	96.0	88.0	88.0	72.0	72.0	100.0	56.0	56.0	88.0	92.0	96.0	48.0	88.0	80.0	56.0	24.0
2	93.1	89.7	89.7	96.6	87.9	70.7	98.3	70.7	69.0	89.7	94.8	91.4	63.8	91.4	82.8	60.3	41.4
3	90.2	86.7	88.8	90.9	83.2	72.0	99.3	70.6	71.3	87.4	96.5	93.7	62.2	84.6	81.8	60.8	33.6
4	96.4	96.1	96.1	96.7	85.3	79.4	98.4	82.0	81.0	96.1	97.4	98.0	73.9	93.5	92.2	64.7	40.8
5	98.5	92.9	98.2	98.2	84.2	86.1	98.5	92.3	91.2	97.8	97.6	99.1	87.6	91.4	95.8	61.7	47.0
6	98.9	96.1	98.8	99.2	90.2	91.0	99.7	94.3	93.3	99.0	98.3	99.6	91.6	95.8	97.0	63.6	54.2
7	98.8	96.3	98.9	99.4	90.9	92.5	99.3	97.1	96.1	99.3	99.0	99.4	94.9	94.8	98.2	66.3	55.4
8	99.7	96.4	99.6	99.6	93.3	93.8	99.2	97.6	97.1	99.2	99.1	99.7	96.0	95.5	99.1	65.9	58.1
9	99.4	96.5	99.6	99.6	93.8	95.9	99.5	98.7	98.2	99.4	98.7	99.8	97.8	96.3	99.1	65.8	60.5
10	99.3	96.2	99.6	99.7	94.7	96.4	99.6	98.8	98.2	99.4	98.6	99.8	98.4	96.6	99.2	66.0	64.9
11	99.7	96.8	99.7	99.6	94.9	97.1	99.7	99.2	98.7	99.4	98.7	99.8	98.5	97.2	99.4	67.7	65.9
12	99.7	96.4	99.8	99.6	94.9	96.9	99.8	99.4	98.8	99.3	98.7	99.8	99.1	96.5	99.4	66.4	68.8
13	99.7	96.7	99.8	99.6	95.2	97.3	99.7	99.5	99.1	99.5	98.7	99.8	99.2	96.9	99.4	66.9	70.2
14	99.8	96.5	99.8	99.8	95.6	97.5	99.8	99.5	99.4	99.6	98.8	99.9	99.4	97.0	99.6	66.5	71.6
15	99.8	96.7	99.8	99.8	96.3	97.7	99.7	99.7	99.4	99.5	98.7	99.9	99.6	96.9	99.6	66.3	73.3
16	99.7	96.1	99.9	99.8	96.3	97.6	99.8	99.6	99.4	99.6	98.6	99.9	99.5	96.9	99.6	65.9	74.2
17	99.7	96.5	99.8	99.8	96.8	97.6	99.8	99.7	99.5	99.6	99.0	99.9	99.5	97.1	99.5	67.5	75.3
18	99.7	96.4	99.8	99.8	96.8	97.2	99.6	99.6	99.4	99.6	99.0	99.8	99.6	96.7	99.5	66.7	76.1
19	99.7	96.6	99.8	99.8	96.9	96.8	99.7	99.7	99.5	99.5	98.6	99.8	99.6	96.5	99.6	67.0	77.3
20	99.8	96.3	99.8	99.8	97.2	96.2	99.8	99.8	99.5	99.7	98.8	99.9	99.7	96.7	99.6	67.3	78.2

2.5 I2-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	61.5	67.1	82.9	66.9	77.3	57.5	88.8	55.4	N/A	86.1	93.1	73.0	37.7	74.3	66.3	44.4	1.8
1	70.8	76.7	89.6	76.4	87.5	68.3	95.3	69.3	N/A	92.3	94.7	82.0	49.1	82.5	79.0	50.0	2.7
2	80.8	84.3	94.0	85.6	94.7	79.7	97.7	81.4	N/A	97.0	96.5	89.9	63.5	87.2	87.1	56.1	2.3
3	87.3	90.1	96.6	91.4	97.4	86.2	98.6	88.8	N/A	97.9	97.7	94.7	74.2	91.1	92.5	60.7	2.7
4	91.9	93.3	98.1	95.6	98.2	91.2	98.7	95.0	N/A	98.5	98.1	97.5	83.7	93.2	96.3	64.0	3.1
5	95.0	94.7	98.7	97.6	98.5	94.4	99.0	97.7	N/A	98.5	98.1	98.9	91.6	94.7	97.9	65.3	3.4
6	96.2	95.5	98.9	98.2	98.7	95.8	99.2	98.6	N/A	98.7	98.3	99.2	94.9	95.4	98.4	65.9	3.9
7	97.4	95.6	99.0	98.8	98.9	97.0	99.1	99.1	N/A	98.7	98.3	99.5	97.1	96.2	98.9	65.7	4.4
8	97.7	95.5	99.1	99.1	99.0	97.5	99.0	99.3	N/A	98.7	98.4	99.6	97.8	96.5	99.1	66.5	5.1
9	97.9	95.8	99.0	99.2	99.1	97.7	99.0	99.4	N/A	98.7	98.4	99.6	97.8	96.7	99.0	66.1	5.9
10	98.2	95.4	99.0	99.1	99.2	97.9	98.9	99.4	N/A	98.5	98.5	99.5	98.1	97.0	99.1	66.0	6.5
11	98.1	95.5	99.1	99.2	98.9	97.6	99.0	99.5	N/A	98.6	98.6	99.6	98.5	97.3	99.2	65.6	6.7
12	98.8	95.6	99.0	99.3	99.2	97.7	99.4	99.6	N/A	98.6	98.4	99.6	98.7	97.3	99.3	65.6	7.3
13	98.9	95.6	98.8	99.5	99.1	96.8	99.2	99.7	N/A	98.1	98.1	99.8	99.1	97.4	99.2	65.6	8.2
14	98.7	96.0	98.7	99.7	98.8	96.0	98.9	99.6	N/A	98.4	98.1	99.6	99.1	97.4	99.1	64.9	11.0
15	99.0	95.5	99.0	99.4	99.2	95.8	99.6	99.7	N/A	98.9	98.4	99.8	99.3	97.8	99.5	66.4	10.3
16	98.4	95.4	99.5	100.0	98.7	92.3	99.9	100.0	N/A	99.0	98.4	99.9	99.4	97.2	99.4	65.4	10.9
17	99.2	97.3	99.3	99.5	99.7	93.3	99.0	99.8	N/A	99.0	98.3	100.0	99.3	97.3	99.7	65.4	12.9
18	98.9	95.5	99.2	98.0	99.2	87.8	98.9	99.2	N/A	98.3	98.3	99.4	99.2	96.9	98.0	68.0	15.9
19	99.5	97.6	99.5	100.0	99.0	84.8	100.0	100.0	N/A	98.6	97.6	100.0	99.5	97.6	100.0	67.6	16.7
20	100.0	97.8	98.5	99.3	100.0	67.4	100.0	100.0	N/A	98.5	97.8	100.0	99.3	95.6	97.0	63.7	25.9

2.6 I2-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	100.0	100.0	100.0	100.0	100.0	66.7	100.0	100.0	83.3	100.0	100.0	100.0	83.3	100.0	100.0	50.0	66.7
1	94.1	94.1	95.6	92.6	97.1	89.7	100.0	92.6	80.9	97.1	98.5	95.6	82.4	94.1	95.6	63.2	35.3
2	97.4	92.5	97.1	96.4	94.7	89.2	98.8	96.2	85.8	97.6	98.8	97.6	92.3	92.5	97.1	62.5	42.1
3	96.6	94.8	96.7	97.1	97.3	88.9	99.6	97.1	91.9	98.6	97.9	98.8	95.5	91.8	96.8	66.2	44.3
4	96.9	95.4	97.8	98.3	96.9	92.4	99.5	98.3	93.0	99.0	98.6	99.3	96.8	93.9	97.5	66.2	46.9
5	98.2	95.3	98.9	98.8	97.6	93.1	99.3	98.8	95.7	99.1	98.8	99.5	97.9	94.4	98.7	65.2	47.1
6	98.6	95.9	99.4	99.2	97.4	94.8	99.5	98.9	96.9	99.3	98.9	99.6	98.5	95.0	99.0	66.5	49.9
7	99.0	95.5	99.6	99.4	97.7	95.5	99.3	99.3	97.8	99.4	99.0	99.7	98.9	95.2	99.1	66.5	51.3
8	99.3	95.7	99.6	99.4	97.8	96.1	99.5	99.5	98.2	99.5	98.8	99.7	99.2	95.1	99.3	66.0	52.0
9	99.4	95.5	99.8	99.6	98.0	96.8	99.5	99.6	98.8	99.4	98.9	99.7	99.6	95.2	99.3	65.9	54.0
10	99.6	95.7	99.8	99.6	98.1	97.1	99.6	99.7	99.0	99.5	98.9	99.8	99.6	95.6	99.4	65.8	55.7
11	99.7	95.8	99.8	99.7	98.2	97.5	99.7	99.8	99.3	99.6	98.9	99.8	99.7	95.6	99.5	66.2	56.6
12	99.7	95.8	99.8	99.7	98.2	97.6	99.6	99.7	99.4	99.6	98.9	99.8	99.8	95.7	99.5	66.1	57.8
13	99.7	96.1	99.8	99.7	98.4	97.7	99.6	99.7	99.4	99.6	98.8	99.8	99.8	96.0	99.5	66.3	59.0
14	99.7	95.7	99.8	99.8	98.3	97.7	99.7	99.7	99.5	99.6	98.9	99.9	99.7	95.9	99.5	66.6	59.9
15	99.8	95.9	99.8	99.8	98.4	97.7	99.8	99.8	99.6	99.6	98.9	99.9	99.8	96.1	99.6	66.4	61.2
16	99.8	95.9	99.9	99.8	98.3	97.6	99.7	99.8	99.6	99.6	98.9	99.9	99.8	96.0	99.6	66.1	62.1
17	99.9	95.8	99.9	99.9	98.4	97.7	99.7	99.8	99.5	99.7	99.0	99.9	99.8	95.8	99.6	66.3	63.3
18	99.8	95.8	99.9	99.8	98.4	97.2	99.7	99.7	99.5	99.6	98.9	99.9	99.8	96.1	99.6	66.2	62.6
19	99.8	96.2	99.9	99.8	98.5	97.5	99.8	99.8	99.5	99.7	98.9	99.9	99.8	96.3	99.6	66.7	64.6
20	99.8	95.9	99.8	99.8	98.2	97.0	99.7	99.8	99.4	99.5	99.0	99.9	99.8	95.9	99.6	66.0	64.8

2.7 I2-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	66.7	66.7
2	93.8	93.8	93.8	93.8	81.2	93.8	100.0	93.8	93.8	93.8	100.0	93.8	100.0	87.5	93.8	56.2	50.0
3	100.0	90.6	100.0	98.1	84.9	84.9	92.5	100.0	100.0	98.1	94.3	100.0	100.0	86.8	100.0	71.7	52.8
4	97.3	94.1	96.8	99.5	95.1	90.8	98.9	97.8	96.8	99.5	95.7	98.9	97.8	90.8	98.4	68.6	57.8
5	97.9	96.4	98.0	99.5	94.7	91.8	98.9	98.8	98.4	97.9	98.4	99.5	98.0	92.7	96.3	68.6	62.9
6	98.8	95.3	98.5	99.0	96.4	93.4	99.0	98.5	97.5	98.8	98.4	99.6	98.5	96.1	97.9	66.9	61.5
7	99.1	96.3	99.0	99.6	97.2	94.9	99.5	99.0	98.9	99.4	98.6	99.7	98.7	95.9	98.6	67.7	62.9
8	99.4	95.4	99.5	99.8	97.7	96.1	99.5	99.2	99.0	99.4	98.8	99.8	99.1	95.6	99.1	65.0	64.1
9	99.5	95.7	99.6	99.6	97.9	96.2	99.5	99.4	99.0	99.5	98.8	99.8	99.3	95.6	99.2	66.0	66.7
10	99.5	95.4	99.7	99.6	98.2	96.8	99.6	99.5	99.3	99.3	98.9	99.7	99.3	96.0	99.3	65.6	67.4
11	99.6	95.5	99.6	99.7	98.1	97.2	99.6	99.6	99.3	99.4	98.9	99.8	99.5	95.7	99.4	66.2	68.2
12	99.6	96.2	99.8	99.7	98.4	97.5	99.7	99.7	99.4	99.6	98.9	99.8	99.6	96.4	99.4	66.9	69.7
13	99.6	96.0	99.8	99.7	98.4	97.6	99.7	99.7	99.5	99.5	98.8	99.8	99.7	96.1	99.5	66.2	70.7
14	99.7	96.0	99.7	99.7	98.4	97.5	99.7	99.6	99.5	99.5	98.8	99.8	99.7	96.0	99.5	66.4	71.5
15	99.7	95.7	99.8	99.8	98.5	97.7	99.7	99.6	99.5	99.6	98.7	99.8	99.6	96.2	99.5	66.0	72.3
16	99.8	95.8	99.9	99.8	98.5	97.8	99.8	99.7	99.5	99.5	99.0	99.9	99.7	96.0	99.6	66.3	73.2
17	99.8	95.8	99.8	99.8	98.5	97.8	99.8	99.7	99.6	99.6	98.9	99.9	99.8	96.5	99.7	66.6	74.1
18	99.8	95.8	99.8	99.9	98.6	97.8	99.8	99.7	99.5	99.6	99.0	99.9	99.7	96.3	99.6	66.0	74.5
19	99.8	95.8	99.8	99.9	98.7	97.6	99.8	99.7	99.6	99.6	98.9	99.9	99.8	96.4	99.7	66.1	74.5
20	99.8	95.9	99.9	99.9	98.7	97.3	99.8	99.7	99.7	99.6	98.9	99.9	99.8	96.4	99.7	66.3	74.8

2.8 I2-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	100.0	100.0	100.0	100.0	75.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	75.0	100.0
5	96.9	84.4	96.9	100.0	87.5	90.6	100.0	96.9	93.8	93.8	93.8	96.9	96.9	93.8	87.5	46.9	62.5
6	97.6	94.0	96.4	100.0	89.2	92.8	100.0	100.0	98.8	95.2	97.6	97.6	100.0	94.0	90.5	67.5	61.4
7	99.5	97.5	99.5	100.0	95.1	87.3	100.0	98.5	99.0	99.0	97.6	99.5	99.0	95.6	96.6	67.2	73.0
8	99.0	95.5	97.6	99.6	95.1	92.8	99.6	98.8	99.4	99.2	99.2	99.4	98.8	95.5	98.0	67.6	74.1
9	98.8	97.1	98.7	99.7	96.6	94.2	99.9	99.4	98.8	99.8	99.0	99.7	99.5	94.0	98.6	67.0	74.0
10	99.1	96.9	99.7	99.7	96.8	94.0	99.6	99.7	99.4	99.6	98.8	99.6	99.3	96.0	99.0	67.2	74.9
11	99.5	95.3	99.6	99.7	97.4	95.0	99.5	99.5	99.2	99.3	98.8	99.5	99.3	96.0	99.1	65.0	75.7
12	99.7	95.6	99.7	99.7	97.8	95.9	99.7	99.6	99.3	99.4	98.7	99.7	99.5	95.9	99.2	66.6	77.4
13	99.5	95.7	99.7	99.7	98.2	96.5	99.7	99.5	99.2	99.4	98.8	99.6	99.4	96.4	99.3	66.8	78.2
14	99.8	95.6	99.8	99.8	98.1	96.8	99.8	99.7	99.4	99.5	98.9	99.8	99.7	96.5	99.5	66.0	78.2
15	99.6	95.6	99.8	99.7	98.3	96.8	99.6	99.6	99.3	99.4	99.0	99.7	99.5	96.3	99.4	65.9	79.7
16	99.6	95.8	99.8	99.7	98.2	97.3	99.6	99.6	99.3	99.3	98.8	99.7	99.6	96.4	99.4	65.7	80.8
17	99.7	95.8	99.8	99.7	98.4	97.2	99.7	99.6	99.4	99.4	98.9	99.8	99.6	96.6	99.5	66.2	80.6
18	99.7	96.0	99.8	99.8	98.5	97.3	99.7	99.6	99.5	99.5	98.9	99.8	99.6	96.6	99.5	66.3	81.1
19	99.7	96.1	99.9	99.8	98.6	97.3	99.7	99.7	99.5	99.5	98.8	99.8	99.6	96.5	99.5	66.6	81.3
20	99.8	96.0	99.8	99.8	98.5	97.1	99.8	99.7	99.5	99.5	99.0	99.8	99.7	96.7	99.6	66.7	82.2

2.9 I3-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	48.2	61.9	68.9	51.6	36.4	29.9	78.1	54.2	N/A	71.7	82.4	63.2	44.1	49.8	50.6	33.3	24.4
1	63.1	74.9	81.1	65.3	52.6	41.2	90.3	67.8	N/A	83.7	89.1	75.7	54.5	62.9	65.3	44.0	28.4
2	76.0	83.5	89.3	77.2	64.0	53.1	95.7	79.4	N/A	91.5	93.0	84.9	65.4	72.7	77.0	52.0	32.1
3	84.9	88.0	93.8	85.7	69.8	62.7	97.1	88.3	N/A	94.1	94.9	91.4	75.8	79.3	85.6	58.1	35.1
4	90.8	89.5	95.8	90.9	72.5	70.5	97.4	93.8	N/A	95.1	95.6	94.9	84.2	82.9	90.4	61.4	37.5
5	94.0	90.0	96.7	93.8	73.8	75.9	97.6	96.2	N/A	95.4	95.9	96.5	90.0	85.2	92.7	63.3	39.6
6	95.7	90.3	97.1	95.4	75.0	80.0	97.8	97.3	N/A	95.6	96.0	97.3	93.2	87.2	94.2	64.1	41.3
7	96.8	90.4	97.3	96.3	75.8	82.9	97.8	97.7	N/A	95.6	96.2	97.7	94.6	88.1	94.7	64.3	43.6
8	97.4	90.5	97.4	96.9	76.8	85.0	98.0	98.0	N/A	95.8	96.3	97.9	95.4	88.9	95.1	64.3	45.4
9	97.6	90.4	97.4	97.0	76.9	86.2	97.8	98.0	N/A	95.6	96.1	97.9	95.6	89.4	95.1	64.1	46.8
10	98.0	90.4	97.4	97.3	77.3	87.1	97.8	98.1	N/A	95.7	96.3	98.0	95.9	90.1	95.4	64.4	48.1
11	98.0	90.1	97.5	97.4	77.2	87.3	97.9	98.1	N/A	95.8	96.3	98.0	95.8	90.2	95.3	64.3	49.5
12	98.1	90.4	97.2	97.3	76.9	87.3	97.8	98.0	N/A	95.4	95.9	97.9	95.9	90.5	95.0	64.2	51.6
13	98.1	90.0	97.1	97.2	76.6	86.5	97.6	98.1	N/A	95.1	95.9	98.0	95.8	90.7	94.9	63.8	52.4
14	98.2	89.8	97.0	97.0	76.4	85.3	97.7	98.1	N/A	94.9	95.7	98.0	95.8	90.4	94.8	64.3	53.5
15	98.1	89.2	96.3	96.3	75.3	83.9	97.1	97.7	N/A	94.0	95.2	97.7	95.4	90.4	94.2	63.9	54.8
16	98.0	89.6	96.6	96.4	75.0	82.4	97.3	97.7	N/A	94.0	95.2	97.5	95.3	90.0	93.6	64.0	55.9
17	97.9	88.3	95.6	95.8	72.5	79.0	96.6	97.1	N/A	93.3	94.2	97.3	94.8	89.3	92.2	62.8	58.5
18	97.8	87.6	95.1	95.1	71.2	75.8	95.8	97.3	N/A	92.4	93.2	97.6	94.2	89.8	92.1	62.6	61.2
19	97.7	87.3	94.0	94.2	67.9	68.7	95.7	96.7	N/A	90.9	93.2	96.9	93.6	88.1	90.4	61.1	64.0
20	97.0	85.9	92.5	92.7	69.1	64.0	93.9	96.0	N/A	88.2	90.9	95.6	92.5	88.4	88.4	61.9	65.7

2.10 I3-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	49.9	51.4	46.5	52.7	N/A	26.5	80.6	50.7	33.9	59.9	73.3	57.1	44.8	52.4	39.7	29.5	26.1
1	66.2	68.0	63.5	68.9	N/A	37.7	92.0	63.3	45.2	76.5	83.1	73.6	52.8	64.8	55.4	40.4	32.2
2	77.3	77.7	73.0	78.9	N/A	48.7	96.1	73.7	55.5	85.9	87.7	81.1	61.9	74.5	65.5	48.8	36.7
3	87.3	86.5	83.3	87.4	N/A	60.4	97.0	84.7	67.1	92.1	92.7	88.9	74.0	80.3	77.7	57.0	41.8
4	92.4	90.3	90.4	92.7	N/A	69.9	97.5	91.4	77.1	94.8	94.9	93.9	83.5	84.4	85.5	60.8	46.6
5	95.8	92.5	94.5	95.4	N/A	76.8	97.8	95.4	84.9	96.2	95.8	96.2	89.8	87.1	90.5	63.8	51.0
6	97.0	93.2	96.5	96.2	N/A	81.0	97.7	96.7	89.5	96.4	96.3	97.2	92.9	88.3	93.1	64.4	53.3
7	97.8	93.4	97.5	96.9	N/A	84.2	97.9	97.5	92.4	96.6	96.7	97.8	94.5	89.5	94.9	64.6	56.1
8	98.2	93.7	98.2	97.3	N/A	86.0	98.0	97.8	94.1	96.7	96.7	98.1	95.4	90.3	95.6	64.8	57.9
9	98.5	93.8	98.6	97.5	N/A	87.4	98.1	97.9	95.2	96.9	96.9	98.3	95.8	91.0	96.3	65.0	59.8
10	98.7	93.7	98.7	97.6	N/A	88.4	98.1	98.0	95.9	96.9	97.0	98.3	96.0	91.2	96.7	65.1	60.9
11	98.9	93.9	98.9	97.9	N/A	89.3	98.3	98.2	96.4	97.2	97.1	98.4	96.3	91.4	97.1	65.2	62.1
12	98.9	93.9	98.9	97.8	N/A	89.5	98.3	98.2	96.8	97.1	97.0	98.5	96.4	91.8	97.2	65.2	63.2
13	99.0	94.0	98.9	97.9	N/A	90.0	98.3	98.2	97.0	97.2	97.0	98.5	96.4	92.1	97.3	65.2	64.1
14	99.0	94.0	99.0	97.9	N/A	90.2	98.3	98.2	97.1	97.2	97.1	98.5	96.4	92.1	97.3	65.0	65.3
15	99.1	94.0	99.0	98.1	N/A	90.4	98.5	98.4	97.4	97.3	97.1	98.6	96.7	92.3	97.6	65.2	66.2
16	99.1	94.2	99.1	98.1	N/A	90.4	98.5	98.3	97.5	97.4	97.1	98.6	96.7	92.4	97.6	65.2	66.9
17	99.1	94.2	99.2	98.1	N/A	90.2	98.5	98.4	97.5	97.4	97.2	98.7	96.7	92.5	97.6	65.1	67.6
18	99.1	94.1	99.0	98.1	N/A	90.0	98.5	98.3	97.5	97.3	97.1	98.7	96.7	92.5	97.6	65.0	68.2
19	99.1	94.2	99.1	98.0	N/A	89.4	98.4	98.3	97.5	97.3	97.2	98.6	96.7	92.6	97.6	65.0	69.1
20	99.1	93.9	99.0	98.0	N/A	89.0	98.4	98.3	97.4	97.1	97.1	98.6	96.6	92.5	97.5	65.1	69.4

2.11 I3-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	57.7	47.1	44.5	65.6	N/A	33.5	86.3	54.2	36.6	59.5	69.6	61.2	43.6	59.0	39.6	33.5	32.2
1	69.5	53.8	57.5	74.8	N/A	40.9	92.9	58.4	45.4	64.8	78.4	73.2	48.4	64.7	45.4	38.9	35.3
2	78.5	67.5	67.2	83.3	N/A	52.3	95.2	68.2	56.3	79.1	81.9	82.7	56.9	75.8	59.2	50.8	39.4
3	88.3	76.1	76.7	90.4	N/A	60.3	97.2	76.9	65.6	87.3	87.7	88.8	66.8	79.9	67.0	55.6	44.9
4	91.8	83.0	85.4	93.9	N/A	68.4	96.9	84.6	74.2	91.7	91.6	93.1	75.3	83.0	77.4	60.8	47.3
5	94.9	87.9	90.5	95.8	N/A	75.1	97.4	90.9	82.2	94.6	94.2	95.6	83.0	85.2	83.4	62.4	52.6
6	96.9	91.5	94.1	97.2	N/A	80.4	97.8	94.6	88.1	96.1	95.0	97.1	88.7	87.4	88.6	64.3	55.5
7	97.5	92.4	96.0	97.3	N/A	83.1	97.6	96.0	91.5	96.4	95.7	97.2	91.6	87.9	91.5	63.8	58.9
8	98.0	93.2	97.3	97.5	N/A	85.4	97.8	96.9	94.0	96.5	96.3	97.6	93.7	89.2	93.7	64.8	62.7
9	98.3	93.9	98.0	97.7	N/A	86.7	97.7	97.4	95.2	96.7	96.5	97.7	94.7	89.8	94.7	64.7	65.5
10	98.5	94.1	98.4	97.6	N/A	87.9	97.8	97.6	96.0	96.8	96.7	98.0	95.1	90.5	95.7	64.7	67.9
11	98.6	94.1	98.6	97.7	N/A	88.5	97.9	97.8	96.5	96.8	96.8	97.9	95.5	91.0	96.2	64.9	69.8
12	98.7	94.5	98.7	97.8	N/A	89.1	98.1	97.9	96.8	97.0	96.8	98.1	95.7	91.4	96.6	65.2	71.4
13	98.8	94.4	98.9	97.9	N/A	89.8	98.2	97.9	97.0	97.1	97.0	98.2	96.0	91.8	97.0	65.0	72.9
14	98.8	94.4	98.9	98.0	N/A	90.0	98.1	98.0	97.2	97.1	97.0	98.2	96.0	92.0	97.0	65.2	73.9
15	98.8	94.4	98.9	98.1	N/A	90.3	98.3	98.0	97.3	97.2	97.0	98.3	96.2	92.1	97.2	64.8	75.0
16	98.9	94.5	98.9	98.2	N/A	90.4	98.3	98.1	97.5	97.3	97.1	98.3	96.3	92.5	97.4	65.1	75.7
17	99.0	94.5	99.0	98.3	N/A	90.5	98.3	98.1	97.5	97.3	97.1	98.3	96.3	92.4	97.5	64.9	76.3
18	99.0	94.6	99.0	98.3	N/A	90.8	98.4	98.2	97.6	97.4	97.2	98.4	96.4	92.6	97.6	65.0	77.1
19	99.1	94.6	99.1	98.4	N/A	90.6	98.4	98.2	97.7	97.5	97.2	98.5	96.5	92.8	97.7	65.2	77.7
20	99.2	94.7	99.1	98.4	N/A	90.8	98.5	98.2	97.7	97.5	97.2	98.5	96.5	92.9	97.8	65.1	78.0

2.12 I3-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	69.9	43.4	42.2	67.5	N/A	28.9	81.9	N/A	39.8	55.4	65.1	60.2	41.0	65.1	36.1	22.9	34.9
1	76.7	49.8	48.5	78.2	N/A	37.4	95.5	N/A	48.0	64.1	69.1	63.4	45.8	67.6	40.3	33.2	34.9
2	83.9	58.7	54.6	86.3	N/A	46.2	95.6	N/A	56.7	73.8	76.0	72.9	54.3	77.9	47.0	46.0	47.0
3	89.5	67.2	67.8	91.5	N/A	52.4	97.1	N/A	63.3	81.6	83.9	79.8	63.5	82.0	57.7	51.6	45.7
4	93.0	75.1	74.6	94.5	N/A	57.6	96.6	N/A	70.3	86.8	87.6	86.4	69.1	82.5	63.5	54.4	50.2
5	95.2	82.7	82.2	96.1	N/A	66.5	96.9	N/A	79.4	91.1	91.1	90.9	78.2	86.5	72.9	59.7	53.8
6	96.8	86.5	87.2	97.0	N/A	70.7	97.7	N/A	84.7	93.9	93.6	93.8	83.0	87.3	78.8	61.6	54.2
7	97.5	89.5	91.6	97.4	N/A	76.0	97.5	N/A	89.4	95.6	93.9	95.7	88.5	87.6	84.2	63.0	59.6
8	98.0	91.6	94.4	97.8	N/A	79.5	97.6	N/A	92.3	96.5	95.4	96.7	91.6	88.7	88.4	65.0	62.5
9	98.3	92.4	95.9	97.7	N/A	82.0	97.8	N/A	93.7	96.5	96.1	97.1	93.2	88.7	90.4	64.3	65.2
10	98.2	93.6	97.1	97.8	N/A	84.5	97.8	N/A	95.3	96.7	96.6	97.4	94.3	89.8	93.0	65.1	67.2
11	98.3	94.0	97.8	97.5	N/A	85.2	97.7	N/A	95.8	96.5	96.4	97.5	94.6	90.2	94.5	64.7	71.1
12	98.4	94.0	98.4	97.7	N/A	86.1	97.9	N/A	96.3	96.8	96.7	97.6	95.0	90.2	95.3	64.9	72.9
13	98.6	94.6	98.5	97.8	N/A	86.8	97.8	N/A	96.7	96.8	96.6	97.6	95.3	90.8	96.1	64.6	75.3
14	98.6	94.7	98.7	97.7	N/A	87.5	97.9	N/A	96.9	96.9	96.7	97.7	95.5	91.0	96.6	65.0	76.9
15	98.7	94.6	98.8	97.6	N/A	87.9	98.0	N/A	96.9	96.8	96.8	97.7	95.5	91.3	96.8	65.1	78.3
16	98.7	94.8	99.0	97.8	N/A	88.1	98.0	N/A	97.1	96.9	96.9	97.8	95.6	91.6	97.1	65.1	79.5
17	98.8	94.8	98.9	97.8	N/A	88.5	98.0	N/A	97.1	96.9	96.8	97.8	95.6	91.8	97.2	65.3	80.3
18	98.8	94.9	99.0	97.8	N/A	88.7	98.1	N/A	97.3	97.1	96.9	97.9	95.9	92.1	97.5	65.3	81.3
19	98.8	94.8	99.1	97.9	N/A	88.7	98.2	N/A	97.3	97.1	96.9	97.9	95.9	92.0	97.4	65.1	81.8
20	98.9	94.9	99.1	98.1	N/A	88.9	98.3	N/A	97.5	97.3	97.1	98.1	96.1	92.4	97.7	65.0	82.5

2.13 I4-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	82.3	72.0	77.8	83.6	0.0	N/A	63.1	77.0	N/A	75.3	78.7	79.3	65.9	64.9	65.1	43.9	59.0
1	83.2	73.0	78.8	83.7	0.0	N/A	62.9	76.9	N/A	75.3	79.4	79.9	66.6	66.1	65.7	44.9	59.9
2	84.0	73.8	79.5	84.4	0.0	N/A	64.4	77.9	N/A	75.5	80.0	80.7	67.3	67.4	66.0	45.9	60.6
3	84.9	74.7	80.5	84.6	0.0	N/A	64.6	78.2	N/A	75.8	80.3	81.4	67.6	67.6	66.3	46.2	60.9
4	85.8	75.6	81.5	84.6	0.0	N/A	65.2	78.8	N/A	76.2	80.7	82.1	68.3	68.0	66.7	46.8	61.5
5	86.7	76.7	82.9	84.8	0.0	N/A	65.8	79.4	N/A	76.6	81.3	83.0	68.9	68.4	67.6	48.1	62.1
6	87.3	77.8	84.0	84.8	0.0	N/A	67.0	79.8	N/A	77.2	81.9	83.8	69.7	68.7	68.9	49.0	62.4
7	88.1	78.6	85.3	85.0	0.0	N/A	68.1	80.5	N/A	77.7	82.4	84.5	70.4	68.9	70.4	49.5	62.7
8	88.7	79.9	86.5	85.1	0.0	N/A	69.9	81.3	N/A	78.4	83.1	85.2	71.5	69.2	72.2	51.0	63.8
9	89.3	80.7	87.5	85.4	0.0	N/A	71.6	82.0	N/A	79.0	83.7	85.8	72.3	69.6	74.2	51.5	64.8
10	89.8	81.7	88.3	85.6	0.0	N/A	73.2	82.5	N/A	79.4	84.0	86.2	73.1	70.3	76.1	52.4	65.5
11	90.0	82.1	88.8	85.8	0.0	N/A	74.2	83.0	N/A	79.7	84.6	86.6	73.5	69.8	77.5	52.7	66.7
12	89.8	82.3	89.1	86.0	0.0	N/A	74.0	83.2	N/A	79.6	84.4	86.7	73.5	70.4	78.1	53.1	67.3
13	89.9	82.4	88.8	86.1	0.0	N/A	74.3	83.1	N/A	79.6	84.4	86.6	73.3	70.2	79.1	52.8	67.3
14	89.5	81.7	88.7	86.1	0.0	N/A	73.6	82.6	N/A	79.6	83.9	86.3	72.8	69.6	78.5	52.4	67.4
15	89.4	81.4	88.6	86.0	0.0	N/A	72.9	82.6	N/A	79.2	84.2	86.1	72.8	70.6	78.6	52.2	67.6
16	89.2	81.2	88.4	86.2	0.0	N/A	71.7	82.1	N/A	78.9	83.8	86.3	72.0	69.9	78.6	51.8	67.4
17	88.9	80.8	87.9	85.8	0.0	N/A	70.8	81.4	N/A	78.6	83.5	85.6	71.8	69.6	77.9	51.7	67.3
18	88.5	80.3	87.9	86.0	0.0	N/A	70.1	81.2	N/A	78.3	83.0	85.8	71.2	68.8	77.4	50.4	66.9
19	88.7	79.7	87.3	85.5	0.0	N/A	70.0	80.9	N/A	78.1	83.1	85.1	71.1	69.3	77.0	50.3	66.9
20	88.2	79.4	87.0	85.8	0.0	N/A	68.7	80.5	N/A	77.7	82.7	85.1	70.1	69.0	77.0	50.5	66.7

2.14 I4-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	91.8	80.8	87.0	83.6	0.0	N/A	70.5	N/A	69.2	74.7	76.7	78.8	71.9	69.2	75.3	51.4	64.4
1	83.6	77.2	82.4	84.0	0.0	N/A	67.5	N/A	68.5	72.8	78.9	74.8	63.3	65.3	65.8	46.7	58.6
2	85.5	77.3	83.3	85.1	0.0	N/A	67.0	N/A	68.3	75.6	81.2	76.6	62.8	66.1	65.7	45.7	59.2
3	85.8	77.5	83.4	84.7	0.0	N/A	67.2	N/A	70.1	76.2	80.3	75.7	63.0	66.4	67.1	46.4	60.1
4	86.1	78.5	83.9	84.0	0.0	N/A	66.4	N/A	70.1	76.3	80.5	76.5	63.3	66.6	67.9	45.9	59.9
5	86.8	78.3	84.3	84.1	0.0	N/A	66.9	N/A	70.5	76.5	80.8	76.8	63.3	67.1	68.3	46.5	60.6
6	87.1	78.8	84.8	84.1	0.0	N/A	66.9	N/A	71.0	76.7	81.2	77.4	63.6	67.5	68.6	46.7	60.8
7	87.1	79.3	85.2	84.0	0.0	N/A	66.8	N/A	71.3	76.4	80.9	77.7	63.4	67.5	69.0	46.8	60.6
8	87.2	79.8	85.8	83.9	0.0	N/A	66.9	N/A	71.6	76.5	81.2	78.3	63.8	67.6	69.5	47.4	60.9
9	87.3	80.3	86.3	83.8	0.0	N/A	67.0	N/A	71.8	76.5	81.3	78.7	63.8	67.8	70.0	47.5	61.0
10	87.5	80.9	86.9	83.8	0.0	N/A	67.5	N/A	72.5	76.9	81.6	79.1	64.3	68.2	70.7	48.2	61.3
11	87.7	81.5	87.5	83.8	0.0	N/A	68.0	N/A	72.9	77.0	81.8	79.6	64.4	68.2	71.6	48.6	61.4
12	87.9	82.1	88.4	84.0	0.0	N/A	68.6	N/A	73.4	77.4	82.1	80.3	64.9	68.3	72.6	48.8	61.9
13	88.3	82.7	88.9	83.9	0.0	N/A	69.6	N/A	74.3	77.8	82.5	80.9	65.6	68.7	73.6	49.5	62.4
14	88.6	83.4	89.5	84.1	0.0	N/A	70.9	N/A	75.1	78.3	83.0	81.5	66.5	69.1	74.9	50.0	62.8
15	89.0	84.1	90.1	84.1	0.0	N/A	72.4	N/A	76.1	78.6	83.1	82.3	67.4	69.3	76.1	50.9	63.7
16	89.7	85.0	90.8	84.4	0.0	N/A	74.1	N/A	77.3	79.4	83.9	82.9	68.5	69.7	77.5	51.6	64.7
17	90.2	85.6	91.2	84.7	0.0	N/A	76.0	N/A	78.5	79.7	84.4	83.5	69.6	70.3	78.8	52.7	65.7
18	90.5	86.2	91.8	84.8	0.0	N/A	77.1	N/A	79.1	80.1	84.6	84.3	70.3	70.6	80.3	52.9	66.4
19	90.5	86.3	92.0	85.0	0.0	N/A	77.8	N/A	79.6	80.2	84.7	84.7	70.6	70.4	80.8	52.9	66.5
20	90.9	86.7	92.1	85.2	0.0	N/A	78.3	N/A	80.0	80.2	85.0	84.9	70.8	70.8	81.5	53.5	67.2

2.15 I4-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	75.0	50.0	50.0	75.0	N/A	N/A	100.0	N/A	75.0	75.0	75.0	75.0	75.0	75.0	25.0	75.0	50.0
1	76.9	74.4	82.1	82.1	N/A	N/A	71.8	N/A	61.5	79.5	71.8	79.5	69.2	61.5	61.5	25.6	56.4
2	83.3	72.1	81.1	84.2	N/A	N/A	64.4	N/A	59.0	69.8	76.1	73.4	53.2	67.6	62.6	40.1	55.0
3	84.8	76.1	84.5	87.8	N/A	N/A	69.8	N/A	68.5	75.4	79.4	75.9	60.3	66.9	65.8	44.5	60.5
4	86.9	79.1	85.2	87.9	N/A	N/A	69.8	N/A	69.9	77.2	81.7	76.8	63.2	66.0	67.2	47.4	62.7
5	87.1	78.2	86.1	86.4	N/A	N/A	67.9	N/A	68.6	77.2	81.9	76.4	62.3	66.5	69.1	47.5	60.8
6	87.0	77.1	85.9	86.4	N/A	N/A	68.0	N/A	68.7	77.3	81.4	76.6	61.9	67.0	69.1	47.0	60.8
7	87.0	77.7	86.2	86.2	N/A	N/A	68.2	N/A	69.0	77.2	81.2	77.0	61.6	66.5	69.4	47.3	61.3
8	86.5	77.2	86.0	86.2	N/A	N/A	67.3	N/A	68.7	76.9	80.7	76.6	61.2	66.4	69.5	46.8	60.5
9	86.5	77.9	86.3	86.0	N/A	N/A	67.4	N/A	68.8	76.8	81.0	76.8	61.3	66.7	69.7	47.1	60.4
10	86.7	78.0	86.5	86.0	N/A	N/A	67.5	N/A	68.7	76.7	81.0	76.9	61.5	66.8	70.1	47.3	60.3
11	86.7	78.4	86.8	85.8	N/A	N/A	67.2	N/A	68.9	76.5	80.9	77.3	61.4	66.8	70.7	47.4	60.5
12	86.6	78.7	87.2	85.7	N/A	N/A	67.4	N/A	68.9	76.6	81.2	77.6	61.3	67.1	70.9	47.8	60.6
13	86.7	79.0	87.6	85.7	N/A	N/A	67.3	N/A	68.9	76.7	81.5	78.0	61.3	67.2	71.3	48.1	60.6
14	86.7	79.1	88.0	85.5	N/A	N/A	67.4	N/A	69.0	76.6	81.3	78.2	61.3	67.2	71.8	48.1	60.6
15	86.8	79.4	88.5	85.5	N/A	N/A	67.7	N/A	69.2	76.8	81.5	78.5	61.4	67.2	72.3	48.6	60.6
16	86.9	79.6	88.9	85.5	N/A	N/A	68.0	N/A	69.4	76.8	81.7	78.9	61.6	67.4	72.7	48.9	60.8
17	87.1	80.0	89.3	85.5	N/A	N/A	68.5	N/A	69.8	77.2	82.0	79.2	62.1	67.5	73.5	49.1	61.1
18	87.3	80.4	89.7	85.4	N/A	N/A	69.0	N/A	70.4	77.4	82.0	79.5	62.4	67.8	74.2	49.4	61.5
19	87.6	81.0	90.1	85.5	N/A	N/A	70.0	N/A	71.1	77.6	82.4	80.1	63.1	68.2	75.2	49.8	62.0
20	87.9	81.5	90.5	85.4	N/A	N/A	70.9	N/A	72.1	78.1	82.6	80.6	64.0	68.4	76.1	50.7	62.6

2.16 I4-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	100.0	100.0	100.0	100.0	N/A	N/A	100.0	N/A	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	0.0	0.0	0.0	0.0	N/A	N/A	100.0	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	60.0	30.0	50.0	60.0	N/A	N/A	90.0	N/A	40.0	50.0	50.0	50.0	40.0	30.0	30.0	30.0	40.0
3	96.0	68.0	80.0	88.0	N/A	N/A	88.0	N/A	76.0	88.0	76.0	72.0	80.0	56.0	56.0	32.0	84.0
4	91.8	73.3	81.5	90.4	N/A	N/A	78.8	N/A	69.2	82.9	82.2	71.9	70.5	67.8	65.8	47.3	66.4
5	86.7	72.5	84.2	88.1	N/A	N/A	75.7	N/A	69.6	76.4	79.9	75.6	65.3	64.5	64.9	47.8	59.3
6	86.5	76.7	85.5	87.1	N/A	N/A	73.9	N/A	70.8	79.8	81.5	77.5	63.8	65.4	70.1	45.3	63.7
7	85.2	76.3	86.1	86.3	N/A	N/A	69.6	N/A	67.5	77.1	81.3	76.9	60.9	65.7	68.4	47.0	60.0
8	86.4	75.9	86.1	85.7	N/A	N/A	70.4	N/A	67.3	77.5	81.4	75.7	61.0	65.4	68.9	46.9	60.7
9	86.6	76.5	86.6	86.4	N/A	N/A	70.1	N/A	67.6	78.0	81.5	77.0	61.0	66.1	70.0	47.6	60.7
10	86.2	76.4	86.5	86.2	N/A	N/A	69.6	N/A	67.2	78.1	81.5	76.2	60.4	66.5	70.4	47.5	60.6
11	85.9	76.2	86.5	85.9	N/A	N/A	69.3	N/A	66.8	77.6	81.2	75.9	60.3	66.1	70.4	46.7	60.1
12	86.0	77.0	86.8	85.7	N/A	N/A	69.0	N/A	67.0	77.9	81.7	76.5	60.3	66.6	70.9	47.4	60.2
13	85.9	77.3	86.9	85.7	N/A	N/A	68.8	N/A	66.7	77.8	81.5	76.5	60.1	66.4	71.2	47.4	60.1
14	85.7	77.3	87.1	85.4	N/A	N/A	68.6	N/A	66.4	77.4	81.4	76.4	59.7	66.5	71.1	47.4	59.7
15	85.9	77.4	87.3	85.3	N/A	N/A	68.9	N/A	66.7	77.6	81.6	76.9	59.9	66.7	71.5	47.5	59.9
16	85.6	77.6	87.6	85.2	N/A	N/A	68.7	N/A	66.3	77.3	81.4	76.9	59.7	66.8	71.5	47.7	59.8
17	85.8	77.7	87.9	85.1	N/A	N/A	68.5	N/A	66.3	77.4	81.6	77.0	59.6	67.0	71.9	47.8	59.9
18	85.6	77.8	88.2	85.0	N/A	N/A	68.5	N/A	66.3	77.3	81.7	77.2	59.5	66.8	72.1	47.9	59.8
19	85.8	78.1	88.6	85.0	N/A	N/A	68.7	N/A	66.4	77.5	81.9	77.5	59.7	67.1	72.5	48.3	59.9
20	85.6	78.2	89.1	85.0	N/A	N/A	68.6	N/A	66.4	77.4	81.9	77.7	59.6	67.1	73.0	48.2	60.0

2.17 I5-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	51.9	57.8	63.7	47.7	N/A	N/A	78.6	N/A	N/A	71.6	81.6	51.4	32.7	51.2	44.8	30.7	N/A
1	64.8	68.7	75.0	59.5	N/A	N/A	88.5	N/A	N/A	80.6	85.5	62.8	44.0	61.4	57.1	39.7	N/A
2	75.4	75.6	83.2	69.4	N/A	N/A	92.8	N/A	N/A	86.2	87.9	72.0	55.6	69.1	67.6	47.0	N/A
3	83.2	79.3	88.6	77.0	N/A	N/A	93.9	N/A	N/A	88.1	89.0	79.6	66.3	74.3	76.0	52.9	N/A
4	88.3	81.0	91.8	82.0	N/A	N/A	94.3	N/A	N/A	88.9	89.6	85.2	75.2	77.6	81.8	56.7	N/A
5	91.5	81.6	93.5	85.2	N/A	N/A	94.5	N/A	N/A	89.3	89.9	89.1	81.8	79.9	85.6	59.1	N/A
6	93.2	81.9	94.4	87.0	N/A	N/A	94.6	N/A	N/A	89.5	90.1	91.5	85.8	81.5	87.7	60.3	N/A
7	94.2	82.1	94.9	88.0	N/A	N/A	94.7	N/A	N/A	89.6	90.2	92.9	87.8	82.7	89.0	61.0	N/A
8	94.9	82.3	95.1	88.7	N/A	N/A	94.9	N/A	N/A	89.8	90.3	93.7	88.9	83.7	89.7	61.2	N/A
9	95.1	82.3	95.2	88.9	N/A	N/A	94.9	N/A	N/A	89.9	90.4	94.1	89.4	84.3	90.1	61.4	N/A
10	95.4	82.4	95.3	89.2	N/A	N/A	95.0	N/A	N/A	89.9	90.5	94.3	89.6	84.8	90.4	61.4	N/A
11	95.5	82.5	95.3	89.3	N/A	N/A	94.9	N/A	N/A	90.0	90.5	94.4	89.9	85.3	90.5	61.5	N/A
12	95.6	82.6	95.2	89.1	N/A	N/A	94.8	N/A	N/A	89.8	90.3	94.4	89.9	85.3	90.5	61.4	N/A
13	95.7	82.5	95.1	89.2	N/A	N/A	94.8	N/A	N/A	89.7	90.3	94.3	90.0	85.5	90.3	61.5	N/A
14	95.5	82.2	94.7	88.6	N/A	N/A	94.3	N/A	N/A	89.2	89.8	94.1	89.8	85.3	90.0	61.1	N/A
15	95.6	81.8	94.5	88.4	N/A	N/A	94.1	N/A	N/A	88.8	89.5	94.0	89.7	85.1	89.7	61.1	N/A
16	95.2	81.6	94.1	88.1	N/A	N/A	93.7	N/A	N/A	88.2	89.1	93.6	89.4	84.9	89.4	60.6	N/A
17	95.1	80.5	93.5	87.2	N/A	N/A	92.9	N/A	N/A	87.3	88.1	93.2	88.7	84.4	88.4	59.4	N/A
18	94.3	79.2	92.1	86.0	N/A	N/A	91.8	N/A	N/A	85.2	86.8	92.4	87.6	83.3	87.0	58.8	N/A
19	93.6	77.1	91.1	83.8	N/A	N/A	90.4	N/A	N/A	83.3	85.3	91.1	86.3	81.3	85.7	57.5	N/A
20	92.4	75.5	89.2	81.3	N/A	N/A	88.4	N/A	N/A	80.6	83.6	89.2	84.0	79.1	82.5	55.4	N/A

2.18 I5-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	51.3	40.5	45.9	50.6	N/A	N/A	N/A	N/A	28.6	55.2	68.4	51.3	31.4	49.5	33.7	31.7	N/A
1	71.5	60.6	64.4	68.4	N/A	N/A	N/A	N/A	44.1	75.5	81.6	70.1	48.8	65.6	51.6	44.1	N/A
2	84.1	73.6	78.2	79.3	N/A	N/A	N/A	N/A	58.8	84.9	86.9	81.3	64.7	74.7	66.4	52.3	N/A
3	90.4	81.8	85.7	85.0	N/A	N/A	N/A	N/A	70.1	88.6	89.4	87.9	75.7	79.8	76.5	57.8	N/A
4	93.0	85.9	90.0	87.1	N/A	N/A	N/A	N/A	77.5	89.6	90.1	91.1	82.3	82.2	82.4	59.9	N/A
5	94.4	88.4	92.6	88.0	N/A	N/A	N/A	N/A	82.5	89.7	90.2	92.9	85.7	83.6	86.5	60.9	N/A
6	95.2	90.0	94.2	88.4	N/A	N/A	N/A	N/A	85.7	89.9	90.2	93.9	87.5	84.3	89.2	61.5	N/A
7	95.7	90.9	95.2	88.8	N/A	N/A	N/A	N/A	87.9	90.0	90.4	94.4	88.6	85.1	91.3	61.8	N/A
8	96.0	91.5	95.8	89.0	N/A	N/A	N/A	N/A	89.7	90.1	90.5	94.9	89.2	85.6	92.6	62.1	N/A
9	96.3	91.9	96.2	89.2	N/A	N/A	N/A	N/A	90.8	90.3	90.7	95.1	89.7	86.1	93.6	62.2	N/A
10	96.4	92.2	96.4	89.4	N/A	N/A	N/A	N/A	91.7	90.4	90.8	95.3	89.9	86.5	94.3	62.3	N/A
11	96.6	92.3	96.5	89.6	N/A	N/A	N/A	N/A	92.3	90.5	90.8	95.4	90.1	86.8	94.8	62.4	N/A
12	96.7	92.5	96.6	89.7	N/A	N/A	N/A	N/A	92.8	90.7	91.0	95.5	90.3	87.1	95.2	62.4	N/A
13	96.8	92.6	96.7	89.8	N/A	N/A	N/A	N/A	93.3	90.8	91.1	95.6	90.5	87.4	95.4	62.5	N/A
14	96.9	92.6	96.7	90.0	N/A	N/A	N/A	N/A	93.5	91.0	91.2	95.6	90.6	87.7	95.6	62.7	N/A
15	97.0	92.6	96.7	90.0	N/A	N/A	N/A	N/A	93.7	91.0	91.3	95.7	90.7	87.8	95.7	62.6	N/A
16	97.0	92.6	96.8	90.1	N/A	N/A	N/A	N/A	93.8	91.1	91.3	95.7	90.8	88.0	95.7	62.6	N/A
17	97.1	92.6	96.7	90.1	N/A	N/A	N/A	N/A	93.9	91.2	91.3	95.7	90.9	88.1	95.7	62.6	N/A
18	97.1	92.6	96.7	90.2	N/A	N/A	N/A	N/A	94.0	91.2	91.4	95.7	90.9	88.2	95.7	62.7	N/A
19	97.0	92.6	96.6	90.1	N/A	N/A	N/A	N/A	94.0	91.3	91.4	95.6	90.9	88.3	95.6	62.6	N/A
20	97.1	92.5	96.5	90.1	N/A	N/A	N/A	N/A	94.0	91.3	91.5	95.5	91.0	88.4	95.6	62.5	N/A

2.19 I5-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	36.7	29.8	24.1	39.7	N/A	N/A	N/A	N/A	19.0	37.5	38.9	38.4	20.3	37.3	21.9	16.3	N/A
1	58.8	43.5	33.8	60.6	N/A	N/A	N/A	N/A	29.8	53.0	55.6	56.2	29.0	54.6	35.7	26.4	N/A
2	77.7	61.4	52.6	76.9	N/A	N/A	N/A	N/A	46.8	73.1	70.6	73.7	46.2	70.5	53.7	40.5	N/A
3	88.7	75.2	67.4	86.8	N/A	N/A	N/A	N/A	62.8	84.8	80.0	83.5	62.6	79.3	68.6	49.7	N/A
4	92.9	83.6	78.6	90.3	N/A	N/A	N/A	N/A	74.9	89.9	85.9	89.8	75.6	84.0	79.3	56.4	N/A
5	95.3	87.8	86.1	91.2	N/A	N/A	N/A	N/A	83.5	91.1	88.9	92.6	83.7	85.4	86.0	59.8	N/A
6	95.8	90.2	90.4	90.7	N/A	N/A	N/A	N/A	88.0	91.2	90.2	94.0	87.2	86.1	89.9	61.0	N/A
7	95.9	91.3	93.0	90.0	N/A	N/A	N/A	N/A	90.3	90.6	90.4	94.4	88.5	85.9	91.9	61.5	N/A
8	96.2	92.1	94.6	89.6	N/A	N/A	N/A	N/A	91.6	90.3	90.5	94.8	89.0	86.0	93.3	62.0	N/A
9	96.2	92.4	95.7	89.3	N/A	N/A	N/A	N/A	92.2	90.0	90.5	94.8	89.0	86.0	94.0	62.1	N/A
10	96.3	92.7	96.5	89.2	N/A	N/A	N/A	N/A	92.7	90.0	90.6	95.0	89.2	86.3	94.7	62.2	N/A
11	96.4	92.7	96.9	89.1	N/A	N/A	N/A	N/A	93.0	90.0	90.7	95.0	89.4	86.4	95.0	62.1	N/A
12	96.4	92.9	97.2	89.1	N/A	N/A	N/A	N/A	93.3	90.1	90.7	95.0	89.5	86.6	95.3	62.2	N/A
13	96.5	92.9	97.5	89.2	N/A	N/A	N/A	N/A	93.5	90.2	90.8	95.1	89.6	86.8	95.5	62.3	N/A
14	96.6	93.0	97.6	89.3	N/A	N/A	N/A	N/A	93.6	90.3	90.8	95.2	89.8	86.9	95.7	62.4	N/A
15	96.7	93.0	97.7	89.4	N/A	N/A	N/A	N/A	93.7	90.4	91.0	95.2	89.9	87.1	95.8	62.3	N/A
16	96.7	93.1	97.8	89.5	N/A	N/A	N/A	N/A	93.9	90.5	91.1	95.3	90.0	87.3	95.9	62.4	N/A
17	96.8	93.1	97.8	89.6	N/A	N/A	N/A	N/A	94.0	90.7	91.2	95.3	90.2	87.5	96.0	62.4	N/A
18	96.9	93.1	97.9	89.8	N/A	N/A	N/A	N/A	94.1	90.8	91.3	95.3	90.4	87.7	96.0	62.5	N/A
19	97.0	93.2	97.9	89.9	N/A	N/A	N/A	N/A	94.2	90.9	91.3	95.3	90.4	87.8	96.1	62.5	N/A
20	97.0	93.2	97.9	90.0	N/A	N/A	N/A	N/A	94.3	91.0	91.4	95.4	90.6	88.0	96.2	62.6	N/A

2.20 I5-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	39.4	20.1	17.9	41.9	N/A	N/A	N/A	N/A	22.6	21.9	39.1	30.8	18.3	33.7	15.4	14.0	N/A
1	56.0	27.9	28.7	60.3	N/A	N/A	N/A	N/A	29.2	34.3	45.3	43.8	23.8	57.8	21.9	20.4	N/A
2	72.4	36.8	39.4	74.4	N/A	N/A	N/A	N/A	39.7	44.6	56.4	56.1	31.9	66.5	30.2	26.4	N/A
3	84.6	51.5	54.3	85.3	N/A	N/A	N/A	N/A	54.8	62.5	68.1	68.7	46.3	76.6	44.8	38.4	N/A
4	91.9	64.1	66.4	92.1	N/A	N/A	N/A	N/A	67.5	76.1	78.2	78.8	60.9	83.8	56.9	47.9	N/A
5	95.3	74.0	76.9	94.4	N/A	N/A	N/A	N/A	78.9	85.8	84.5	86.1	74.4	86.4	69.9	55.3	N/A
6	96.7	81.4	84.5	94.9	N/A	N/A	N/A	N/A	85.9	90.2	89.0	90.5	83.2	87.9	78.4	59.1	N/A
7	96.9	85.9	89.6	93.8	N/A	N/A	N/A	N/A	90.2	91.8	90.8	93.0	87.8	88.3	84.5	61.3	N/A
8	97.1	89.2	92.6	93.1	N/A	N/A	N/A	N/A	92.4	92.5	91.6	94.1	90.4	88.5	88.5	61.9	N/A
9	96.9	90.9	94.4	91.9	N/A	N/A	N/A	N/A	93.2	91.8	91.8	94.7	90.7	88.0	91.1	62.7	N/A
10	96.7	91.9	95.6	90.9	N/A	N/A	N/A	N/A	93.3	91.1	91.3	94.7	90.2	87.5	92.8	62.1	N/A
11	96.6	92.4	96.3	89.9	N/A	N/A	N/A	N/A	93.3	90.5	90.9	94.8	89.7	86.8	93.6	62.2	N/A
12	96.5	93.0	96.8	89.5	N/A	N/A	N/A	N/A	93.3	90.2	90.7	94.9	89.4	86.7	94.4	62.4	N/A
13	96.5	93.1	97.2	89.3	N/A	N/A	N/A	N/A	93.4	90.1	90.6	95.0	89.4	86.6	94.9	62.2	N/A
14	96.5	93.3	97.4	89.0	N/A	N/A	N/A	N/A	93.5	90.0	90.5	95.0	89.3	86.5	95.2	62.1	N/A
15	96.5	93.3	97.5	88.9	N/A	N/A	N/A	N/A	93.4	90.0	90.5	94.9	89.2	86.5	95.4	62.2	N/A
16	96.5	93.5	97.6	88.9	N/A	N/A	N/A	N/A	93.5	90.1	90.5	94.9	89.3	86.7	95.6	62.2	N/A
17	96.6	93.5	97.6	89.0	N/A	N/A	N/A	N/A	93.6	90.2	90.7	95.0	89.5	86.8	95.8	62.3	N/A
18	96.6	93.6	97.7	89.1	N/A	N/A	N/A	N/A	93.6	90.3	90.7	95.0	89.6	86.9	95.9	62.3	N/A
19	96.7	93.6	97.7	89.2	N/A	N/A	N/A	N/A	93.7	90.4	90.8	95.0	89.7	87.2	95.9	62.3	N/A
20	96.7	93.6	97.7	89.3	N/A	N/A	N/A	N/A	93.8	90.5	90.9	95.1	89.9	87.3	96.0	62.3	N/A

2.21 I6

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	100.0	100.0	100.0	100.0	50.0	0.0	100.0	100.0	50.0	50.0	100.0	100.0	100.0	100.0	100.0	0.0	50.0
4	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	0.0	100.0
5	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	2.5	1.3	2.5	1.3	3.8	5.1	1.3	1.3	1.3	1.3	5.1	17.7	1.3	1.3	1.3	1.3	1.3
7	8.0	8.0	12.0	16.0	4.0	0.0	8.0	4.0	0.0	4.0	8.0	4.0	0.0	4.0	4.0	4.0	4.0
8	16.7	14.6	14.6	18.8	4.2	10.4	16.7	14.6	12.5	14.6	20.8	10.4	10.4	10.4	10.4	12.5	8.3
9	15.4	19.2	26.9	34.6	0.0	15.4	23.1	19.2	23.1	11.5	34.6	32.0	23.1	7.7	7.7	3.8	3.8
10	16.2	16.2	18.8	11.2	2.5	22.5	17.5	11.2	11.2	15.0	23.8	44.3	16.2	8.8	6.2	2.5	3.8
11	24.4	24.4	24.4	30.5	7.3	22.2	26.8	23.2	15.9	22.0	20.7	33.3	19.5	13.4	14.6	12.3	12.2
12	34.6	30.8	33.8	39.8	14.3	30.8	32.3	30.1	24.1	28.6	33.8	30.2	26.3	21.1	18.8	16.5	13.5
13	34.4	34.4	33.9	37.7	24.0	29.0	39.3	36.1	31.7	35.0	22.4	35.6	32.2	23.5	27.3	12.6	13.1
14	86.4	88.2	87.3	86.4	49.1	69.1	89.1	82.7	79.1	80.9	69.1	86.5	78.2	64.5	64.5	41.8	43.6
15	72.6	73.0	72.1	74.4	41.4	67.9	74.0	69.3	67.9	68.4	62.3	74.3	67.0	57.7	59.5	34.9	41.4
16	90.6	92.8	92.2	92.8	58.0	76.5	89.9	89.3	86.0	88.9	66.4	90.2	88.6	71.3	82.7	42.7	47.2
17	78.3	76.4	77.3	77.1	60.2	69.5	78.3	75.0	73.5	72.8	60.4	77.1	76.6	60.6	72.4	42.9	42.7
18	84.8	83.7	84.8	85.2	59.3	77.1	86.0	82.9	82.3	77.2	63.5	84.7	82.1	67.0	78.0	42.7	46.4
19	92.4	94.4	94.6	94.2	69.8	85.3	92.5	91.9	91.7	88.3	70.3	93.5	91.6	78.8	87.4	48.2	57.0
20	91.0	93.8	94.5	93.5	70.4	84.4	92.3	91.2	90.2	87.7	69.5	93.6	90.0	75.7	87.4	45.6	53.5

3. Sensitivity vs Differential Supporting Read Coverage

3.1 I1

Coverage	Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
10	-10	85.7	90.5	100.0	90.5	100.0	71.4	100.0	90.5	N/A	95.2	95.2	90.5	90.5	90.5	90.5	61.9	4.8
	-8	93.0	89.9	96.9	93.0	95.3	83.7	99.2	95.3	N/A	98.4	96.1	93.8	91.5	93.0	94.6	63.6	11.6
	-6	94.1	96.3	98.9	97.6	99.2	84.5	99.5	98.4	N/A	99.2	98.4	99.5	94.4	90.4	97.9	64.2	6.4
	-4	93.8	92.9	97.3	95.5	98.2	83.2	99.0	94.6	N/A	98.7	98.1	97.6	89.7	89.4	96.5	62.8	6.1
	-2	90.1	91.7	97.1	92.1	97.4	79.9	98.3	92.8	N/A	98.0	97.3	96.0	84.9	87.2	93.8	63.1	5.4
	0	70.4	73.4	87.5	72.4	84.2	60.3	93.3	69.8	N/A	89.7	93.2	81.2	56.9	73.8	75.4	48.4	3.2
	2	78.9	84.2	94.0	81.9	95.3	69.2	98.1	81.1	N/A	96.9	95.6	89.8	64.9	81.6	85.8	56.7	2.5
	4	87.6	91.4	97.2	90.5	98.2	79.5	98.8	91.9	N/A	98.3	97.1	96.0	79.7	86.7	93.6	62.3	3.0
	6	93.1	95.0	98.5	95.8	99.1	86.5	98.9	97.6	N/A	98.5	97.7	98.6	90.6	89.4	97.0	65.6	4.3
	8	96.1	95.5	99.0	98.1	99.3	89.8	99.2	99.0	N/A	98.8	98.2	99.5	96.1	90.9	98.1	66.7	5.2
	10	98.0	96.3	99.0	99.2	99.3	91.9	99.1	99.7	N/A	98.7	98.0	99.7	98.5	91.7	99.1	67.0	6.5
20	-10	100.0	96.1	100.0	100.0	98.2	83.8	100.0	99.6	98.2	96.5	99.1	99.6	99.1	95.2	99.1	59.2	72.8
	-8	99.8	97.4	99.5	99.5	96.6	85.4	99.5	99.2	98.0	97.4	98.5	99.7	99.0	95.4	99.5	70.9	71.2
	-6	99.5	96.3	99.7	99.4	96.9	88.8	99.6	99.4	98.0	98.1	98.1	99.8	98.9	94.6	99.6	64.1	69.3
	-4	99.2	96.1	99.4	99.5	97.2	91.3	99.8	99.1	97.6	97.3	98.6	99.7	98.4	94.1	99.3	66.2	64.5
	-2	99.2	95.9	99.4	99.2	96.6	89.1	99.6	98.7	96.0	97.5	98.6	99.7	97.6	95.0	99.0	67.0	63.3
	0	97.0	95.1	97.7	97.0	94.8	88.7	99.2	95.5	91.7	96.9	97.8	98.1	93.8	93.4	97.3	66.9	60.6
	2	95.6	93.5	96.0	94.9	92.0	85.0	99.4	91.9	84.2	97.5	97.0	97.2	87.0	91.7	96.2	63.8	53.8
	4	96.7	94.9	97.7	97.2	93.0	86.8	99.3	95.3	86.5	97.5	97.6	98.6	91.0	92.7	97.5	65.2	49.4
	6	98.2	96.1	99.1	98.5	94.1	91.1	99.6	97.5	90.4	97.9	98.4	99.5	95.1	93.8	98.6	66.5	51.8
	8	98.9	96.3	99.5	99.1	95.4	93.6	99.6	99.0	94.7	98.1	98.3	99.7	97.6	95.0	99.1	66.9	55.4
	10	99.3	96.4	99.8	99.5	96.2	94.9	99.6	99.3	96.7	98.1	98.6	99.9	98.8	94.8	99.2	67.2	58.4
30	-10	99.5	95.8	99.3	99.7	98.3	79.5	99.5	99.5	99.3	99.3	98.8	99.8	99.5	94.8	99.3	68.4	81.3
	-8	100.0	95.9	99.5	100.0	98.3	81.7	99.9	99.5	99.5	99.6	98.6	99.8	99.5	95.8	99.7	66.6	77.1
	-6	99.7	96.4	99.8	99.7	98.1	86.0	99.7	99.8	99.4	99.4	98.9	99.8	99.5	95.8	99.6	66.6	74.4
	-4	99.8	96.5	99.8	99.8	97.7	87.7	99.8	99.6	99.3	99.7	98.8	100.0	99.3	95.8	99.6	66.7	73.6
	-2	99.7	95.9	99.6	99.8	97.1	87.3	99.7	99.3	98.9	99.5	98.8	99.8	99.0	95.8	99.4	66.3	73.2
	0	99.5	96.2	99.5	99.6	97.5	87.6	99.7	98.8	98.3	99.5	98.9	99.8	98.3	95.7	99.1	66.4	71.7
	2	99.2	95.8	99.2	99.0	96.5	86.1	99.8	97.4	96.7	99.1	98.7	99.4	96.6	95.0	98.7	66.0	70.1
	4	98.9	95.7	99.0	99.2	94.5	84.8	99.6	97.5	95.5	99.4	98.7	99.6	95.4	94.5	98.0	65.7	65.2
	6	99.0	95.9	99.4	99.3	94.5	88.4	99.6	97.9	96.2	99.6	98.6	99.6	96.0	95.1	98.6	67.0	59.0
	8	99.4	96.2	99.7	99.5	94.5	91.3	99.7	98.7	97.3	99.4	98.6	99.7	97.5	96.0	99.0	66.1	59.5
	10	99.4	96.4	99.7	99.7	95.7	94.0	99.7	99.3	98.5	99.6	98.9	99.8	98.9	95.9	99.5	67.1	61.8
40	-10	99.8	96.1	99.8	99.9	98.5	79.1	100.0	99.9	99.7	99.7	98.7	99.9	100.0	95.6	99.9	66.7	82.9
	-8	99.8	95.7	99.8	99.8	97.5	83.6	99.9	99.4	99.7	99.7	98.4	99.9	99.8	96.5	99.8	65.3	84.0
	-6	99.9	96.0	99.9	99.9	97.5	84.9	99.9	99.7	99.7	99.6	98.7	99.9	99.7	96.5	99.9	65.7	81.9
	-4	99.9	96.0	99.9	99.9	97.9	86.1	99.8	99.6	99.6	99.5	99.0	99.9	99.6	96.2	99.8	66.3	81.2
	-2	99.9	96.4	99.8	99.9	97.7	86.9	99.9	99.6	99.5	99.6	99.2	100.0	99.5	96.2	99.7	66.9	80.2
	0	99.8	95.9	99.7	99.8	97.9	86.5	99.8	99.4	99.2	99.6	98.7	99.9	99.2	96.4	99.6	66.6	80.6
	2	99.5	95.7	99.5	99.5	97.2	85.6	99.7	98.9	98.7	99.3	98.4	99.7	98.6	96.0	99.1	65.5	80.0
	4	99.6	95.9	99.7	99.5	96.5	85.1	99.6	98.7	98.4	99.5	99.1	99.8	97.9	95.7	99.2	65.7	78.9
	6	99.5	96.1	99.5	99.7	96.3	86.5	99.6	98.5	98.3	99.5	98.7	99.8	97.7	95.1	99.1	66.3	73.2
	8	99.4	96.7	99.6	99.6	95.3	89.7	99.7	98.9	98.5	99.4	98.3	99.8	98.1	96.0	99.0	67.4	69.2
	10	99.7	96.9	99.7	99.7	95.6	92.6	99.7	99.1	98.7	99.5	98.9	99.8	98.5	96.7	99.4	67.9	68.6

3.2 I2

Coverage	Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
10	-10	85.3	91.2	94.1	88.2	94.1	82.4	97.1	85.3	N/A	91.2	97.1	88.2	82.4	88.2	88.2	64.7	14.7
	-8	91.7	92.9	97.6	95.2	97.0	88.7	98.2	91.7	N/A	97.6	97.6	96.4	79.2	95.8	94.0	63.7	5.4
	-6	91.8	91.6	96.4	94.1	97.5	88.0	99.3	92.6	N/A	98.2	97.2	94.9	82.3	91.5	93.6	63.2	4.6
	-4	91.5	92.7	98.0	95.3	97.8	90.1	99.1	94.2	N/A	98.3	98.2	96.9	84.6	94.2	95.9	63.3	3.7
	-2	93.1	93.8	98.1	95.8	97.6	92.3	99.2	95.3	N/A	98.5	98.3	97.3	88.3	93.2	96.5	64.0	4.2
	0	83.4	85.7	94.2	87.1	93.3	82.3	97.0	83.7	N/A	95.2	96.4	90.7	72.2	89.1	88.4	57.6	3.4
	2	87.5	90.3	96.6	91.6	97.4	86.9	98.6	88.9	N/A	97.8	97.7	94.7	75.0	91.3	92.7	60.8	2.8
	4	94.8	94.6	98.6	97.4	98.5	94.3	98.9	97.5	N/A	98.5	98.2	98.9	91.0	94.5	97.7	65.0	3.4
	6	97.2	95.7	99.0	98.7	98.9	96.9	99.1	99.0	N/A	98.7	98.3	99.5	96.9	96.2	98.8	65.8	4.3
	8	97.9	95.9	99.1	99.2	99.1	97.7	99.0	99.4	N/A	98.8	98.5	99.6	97.8	96.7	99.0	66.1	5.8
20	10	98.1	95.6	99.2	99.3	98.9	97.7	99.2	99.5	N/A	98.7	98.7	99.6	98.5	97.4	99.2	65.7	6.5
	-10	99.4	95.2	100.0	99.1	98.8	94.6	100.0	99.7	97.6	100.0	98.5	100.0	99.1	95.2	99.4	68.3	55.0
	-8	99.9	94.8	99.8	99.9	98.1	95.7	99.4	99.4	98.6	99.3	98.3	100.0	99.5	95.1	99.4	67.0	52.8
	-6	99.6	95.3	99.6	99.6	97.8	96.8	99.8	99.5	98.3	99.3	98.6	99.6	99.4	94.6	99.2	67.1	55.0
	-4	99.5	95.5	99.7	99.5	98.1	96.5	99.6	99.6	98.9	99.7	98.9	99.8	99.4	95.2	99.4	66.4	57.0
	-2	99.6	95.4	99.8	99.5	98.1	97.0	99.5	99.5	98.7	99.4	98.8	99.8	99.5	96.2	99.5	66.0	56.2
	0	99.5	96.1	99.7	99.5	97.8	97.4	99.5	99.6	98.8	99.5	98.7	99.7	99.3	96.0	99.3	66.3	58.2
	2	98.9	95.4	99.0	99.0	98.1	95.0	99.5	99.0	97.6	99.3	98.2	99.6	98.6	95.1	98.7	65.9	56.3
	4	98.6	96.0	99.0	98.9	97.9	94.7	99.4	99.0	96.7	99.2	98.7	99.6	98.3	94.8	98.8	66.3	51.3
	6	99.0	95.6	99.6	99.4	97.8	95.5	99.3	99.3	97.6	99.4	98.9	99.6	98.9	95.2	99.2	66.6	52.1
30	8	99.4	95.4	99.8	99.6	97.9	96.7	99.5	99.6	98.7	99.4	99.0	99.7	99.6	95.1	99.3	65.8	53.6
	10	99.7	95.8	99.8	99.7	98.2	97.5	99.7	99.8	99.2	99.6	99.0	99.8	99.7	95.5	99.5	66.0	55.9
	-10	100.0	95.7	99.9	99.9	98.7	96.6	99.4	99.9	99.8	99.6	99.0	100.0	100.0	96.8	99.9	68.9	71.8
	-8	99.8	96.9	100.0	99.8	98.2	97.0	99.8	99.6	99.6	99.8	98.6	99.9	99.7	96.5	99.9	67.7	69.5
	-6	99.9	95.4	99.8	99.8	98.9	97.0	99.6	99.6	99.4	99.5	99.0	99.9	99.7	96.0	99.6	65.6	72.8
	-4	99.7	96.1	99.9	99.8	99.0	97.4	99.8	99.7	99.5	99.5	98.8	99.9	99.8	96.3	99.6	66.7	73.5
	-2	99.8	95.8	99.8	99.8	98.4	97.7	99.8	99.6	99.6	99.5	99.0	99.8	99.7	96.6	99.6	65.9	73.5
	0	99.7	95.8	99.9	99.8	98.8	97.4	99.7	99.8	99.5	99.6	99.0	99.8	99.6	96.5	99.6	66.9	74.4
	2	99.7	95.9	99.7	99.7	98.6	96.9	99.5	99.6	99.4	98.6	99.8	99.6	99.6	96.4	99.6	66.9	74.4
	4	99.7	95.8	99.6	99.7	98.1	96.9	99.7	99.5	99.5	99.4	98.6	99.9	99.5	95.8	99.3	65.9	73.3
40	6	99.5	96.0	99.5	99.8	98.1	95.9	99.6	99.4	99.3	99.5	98.6	99.8	99.3	96.2	99.2	67.3	71.2
	8	99.5	95.6	99.7	99.6	97.9	96.4	99.4	99.3	99.1	99.4	98.8	99.8	99.3	95.7	99.3	65.6	68.7
	10	99.5	95.5	99.6	99.7	98.1	97.1	99.6	99.6	99.3	99.4	98.9	99.7	99.5	95.6	99.3	66.0	68.5
	-10	99.7	95.2	99.7	99.7	98.5	95.5	99.9	99.8	99.7	99.3	98.8	99.7	99.8	96.1	99.8	64.7	82.9
	-8	99.8	96.2	100.0	99.9	97.9	96.5	99.8	99.8	99.8	99.6	99.2	99.9	99.8	96.6	99.6	69.3	82.2
	-6	99.9	95.7	99.8	99.9	98.6	96.6	99.9	99.7	99.7	99.6	98.8	99.8	99.7	97.3	99.7	65.9	81.8
	-4	99.8	96.7	99.8	99.9	98.8	97.2	99.8	99.7	99.6	99.6	98.6	99.9	99.9	97.1	99.7	66.8	81.3
	-2	99.8	95.9	99.8	99.7	98.5	96.3	99.7	99.6	99.4	99.5	98.5	99.8	99.7	96.7	99.5	66.6	83.1
	0	99.8	96.0	99.8	99.8	98.7	96.2	99.7	99.7	99.6	99.6	98.8	99.9	99.8	97.1	99.8	67.0	82.2
	2	99.8	95.8	99.9	99.8	98.6	96.1	99.7	99.7	99.5	99.5	98.7	99.8	99.7	97.0	99.7	66.6	83.5
	4	99.8	96.0	99.9	99.9	98.6	95.3	99.9	99.9	99.6	99.7	98.8	99.9	99.8	97.1	99.7	67.5	83.1
	6	99.7	96.1	99.7	99.8	98.7	94.9	99.8	99.6	99.3	99.5	98.8	99.8	99.6	96.6	99.2	66.4	83.6
	8	99.6	96.7	99.7	99.8	98.6	94.0	99.9	99.5	99.5	99.6	99.2	99.7	99.6	96.4	99.4	66.9	82.4
	10	99.6	95.5	99.7	99.8	98.1	94.9	99.6	99.6	99.4	99.6	99.0	99.8	99.5	96.5	99.4	65.8	79.8

3.3 I3

Coverage	Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
10	-10	89.1	84.2	88.9	87.5	63.1	52.2	94.6	90.1	N/A	85.6	90.1	92.7	81.1	79.9	82.3	57.2	52.0
	-8	89.3	85.3	93.1	88.4	67.0	63.4	95.3	89.5	N/A	91.2	94.1	91.0	80.4	80.2	84.6	56.7	43.3
	-6	90.7	88.4	94.0	89.4	71.7	68.0	96.7	91.3	N/A	92.8	94.0	93.5	84.1	83.4	88.7	60.7	40.8
	-4	91.6	87.5	94.6	91.0	71.8	72.2	96.9	92.6	N/A	94.0	94.9	94.0	84.9	82.9	89.7	59.7	40.3
	-2	91.7	88.7	95.3	91.6	73.8	75.0	97.2	93.3	N/A	94.2	95.3	94.6	86.8	83.8	90.4	61.8	41.3
	0	77.3	81.9	88.0	78.6	62.9	59.8	93.5	81.0	N/A	88.9	92.1	85.3	71.9	73.6	78.1	52.9	35.1
	2	85.5	88.2	93.9	86.3	70.2	64.5	97.1	88.7	N/A	94.1	95.0	91.8	76.9	80.1	86.1	58.6	35.8
	4	93.8	90.0	96.7	93.6	73.8	75.6	97.6	96.1	N/A	95.4	95.9	96.4	89.6	85.2	92.7	63.2	39.4
	6	96.7	90.4	97.3	96.2	75.7	82.6	97.8	97.7	N/A	95.7	96.2	97.6	94.4	87.9	94.6	64.2	43.3
	8	97.5	90.5	97.5	97.0	76.8	86.0	97.8	98.0	N/A	95.7	96.2	97.8	95.5	89.3	95.1	64.1	46.5
20	10	98.0	90.1	97.5	97.4	77.2	87.2	97.9	98.1	N/A	95.8	96.3	98.0	95.8	90.2	95.3	64.3	49.3
	-10	96.9	93.0	96.5	95.2	N/A	77.8	97.4	96.5	92.8	94.8	95.4	97.2	93.0	89.5	93.9	63.3	63.1
	-8	97.9	93.2	97.4	96.2	N/A	82.6	97.5	97.0	93.8	95.8	96.1	97.3	94.0	90.0	94.3	64.9	60.6
	-6	98.4	93.3	97.8	97.1	N/A	85.1	97.8	97.3	94.1	96.2	96.9	97.7	94.8	90.7	95.5	65.9	61.8
	-4	98.2	93.6	97.9	97.1	N/A	86.4	98.2	97.4	94.6	96.9	96.6	97.7	95.3	91.2	95.9	64.6	61.3
	-2	98.2	93.6	98.2	97.5	N/A	87.5	98.2	97.6	95.2	96.9	96.9	98.1	95.6	91.1	96.2	65.5	62.1
	0	95.2	91.4	94.8	94.8	N/A	83.3	97.6	94.4	90.5	95.1	95.6	95.8	91.5	89.0	92.5	62.8	60.1
	2	94.4	91.2	92.8	93.9	N/A	78.8	97.9	92.9	85.4	95.3	95.5	94.7	87.9	87.5	89.7	62.3	56.3
	4	96.5	93.0	95.6	96.2	N/A	80.3	98.0	96.0	87.7	96.6	96.2	96.8	91.2	88.4	92.1	64.0	55.1
	6	97.8	93.3	97.6	97.0	N/A	84.4	98.0	97.5	92.4	96.7	96.8	97.8	94.5	89.6	94.8	64.7	56.8
	8	98.4	93.9	98.5	97.6	N/A	87.4	98.1	97.9	95.1	96.9	96.9	98.3	95.8	90.9	96.3	65.0	59.4
30	10	98.8	93.9	98.9	97.9	N/A	89.2	98.3	98.2	96.4	97.2	97.1	98.5	96.3	91.4	97.1	65.1	61.5
	-10	98.4	93.3	97.9	97.1	N/A	84.9	97.9	97.1	95.8	96.4	96.4	97.4	94.9	91.6	95.3	64.6	73.0
	-8	98.5	93.9	98.5	97.7	N/A	87.2	98.2	97.5	96.5	96.8	96.7	97.9	95.5	92.0	96.1	64.8	74.6
	-6	98.7	94.3	98.7	98.0	N/A	88.6	98.2	97.8	96.6	97.1	96.8	98.2	95.5	91.8	96.8	65.0	74.8
	-4	98.9	94.2	98.8	98.1	N/A	89.4	98.2	97.9	96.9	97.2	96.8	98.2	95.9	92.1	96.8	65.2	75.4
	-2	98.9	94.4	98.6	98.4	N/A	89.7	98.4	97.9	97.0	97.2	96.9	98.3	95.9	92.3	97.0	65.3	75.4
	0	98.2	93.4	97.7	97.6	N/A	88.8	98.3	97.1	96.0	96.5	96.7	97.6	95.0	91.8	96.1	64.3	75.6
	2	97.8	92.3	96.0	97.3	N/A	86.9	98.4	95.7	93.6	96.3	96.0	97.1	93.0	91.2	93.7	64.3	73.4
	4	97.8	92.4	96.2	97.6	N/A	85.7	98.3	95.8	92.6	96.8	96.3	97.6	92.2	90.7	93.0	64.5	70.1
	6	98.1	93.1	97.2	97.8	N/A	86.1	98.1	96.8	93.9	96.9	96.4	97.8	93.5	90.0	93.9	64.4	67.2
	8	98.5	94.1	98.2	97.9	N/A	87.5	97.9	97.6	95.6	96.9	96.7	97.9	95.0	90.5	95.1	64.9	67.8
40	10	98.6	94.2	98.6	97.8	N/A	88.6	98.0	97.8	96.5	96.9	96.8	98.0	95.5	91.1	96.2	65.0	70.1
	-10	98.7	94.2	98.7	97.6	N/A	85.4	97.6	N/A	96.9	96.7	96.5	97.7	94.9	91.1	97.0	64.7	81.6
	-8	99.0	94.6	98.8	97.9	N/A	86.8	98.3	N/A	97.2	97.4	97.0	97.8	96.0	92.2	97.1	65.9	82.5
	-6	99.2	95.1	99.0	98.1	N/A	87.6	98.3	N/A	97.4	97.0	97.1	98.0	95.9	92.6	97.7	65.9	83.0
	-4	99.0	94.7	98.9	98.1	N/A	87.7	98.3	N/A	97.3	97.2	96.9	98.0	95.9	92.6	97.3	65.5	83.0
	-2	99.0	94.9	99.0	98.2	N/A	87.6	98.4	N/A	97.4	97.3	97.0	98.0	96.0	92.6	97.5	65.1	83.6
	0	98.8	94.3	98.5	98.2	N/A	87.2	98.5	N/A	97.1	97.0	96.9	98.0	95.7	92.6	97.1	65.0	83.1
	2	98.6	93.6	97.4	97.8	N/A	86.1	98.5	N/A	95.9	96.6	96.4	97.3	94.8	92.5	95.9	65.0	82.1
	4	98.6	93.0	96.6	98.1	N/A	84.3	98.4	N/A	95.2	96.6	96.4	97.2	93.7	92.4	94.3	64.3	80.2
	6	98.7	93.4	96.9	98.1	N/A	84.0	98.4	N/A	95.4	97.1	96.4	97.7	94.0	91.6	93.9	64.7	78.1
	8	98.8	93.7	97.5	98.1	N/A	84.3	98.3	N/A	95.9	97.1	96.7	97.8	95.1	91.2	94.1	64.9	75.7
	10	98.6	94.3	98.2	97.9	N/A	85.4	98.1	N/A	96.4	97.0	96.8	97.8	95.3	91.3	95.4	64.8	75.3

3.4 I4

Coverage	Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HiTEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
10	-10	86.1	77.5	84.4	84.8	0.0	N/A	67.5	80.0	N/A	76.8	82.0	82.8	69.4	67.6	72.9	49.1	64.2
	-8	87.1	78.3	85.0	85.7	0.0	N/A	69.4	79.9	N/A	77.0	81.5	83.7	69.4	68.4	73.1	49.4	64.0
	-6	87.4	78.6	84.8	85.5	0.0	N/A	70.8	81.3	N/A	77.3	82.1	83.5	71.0	68.7	71.7	50.0	63.8
	-4	88.0	78.7	85.0	85.8	0.0	N/A	72.4	80.9	N/A	78.0	82.0	84.4	71.3	69.0	71.4	50.7	64.2
	-2	88.5	79.2	83.9	85.5	0.0	N/A	74.2	82.2	N/A	77.9	81.8	84.1	72.3	69.4	69.0	51.0	62.2
	0	84.7	74.7	80.2	84.3	0.0	N/A	66.2	78.5	N/A	76.3	80.2	81.2	68.3	67.3	66.3	46.2	60.3
	2	85.1	74.9	80.5	84.6	0.0	N/A	65.7	78.7	N/A	76.0	80.4	81.6	68.0	67.7	65.9	46.4	61.0
	4	86.9	77.0	83.0	84.8	0.0	N/A	66.8	79.9	N/A	77.0	81.6	83.2	69.5	68.5	67.2	48.2	62.2
	6	88.5	79.2	85.6	85.1	0.0	N/A	69.7	81.1	N/A	78.2	82.8	84.8	71.1	69.1	70.2	50.0	62.9
	8	89.6	81.2	87.9	85.5	0.0	N/A	73.0	82.6	N/A	79.4	84.0	86.2	73.0	69.7	74.6	51.9	65.1
20	-10	89.1	82.4	89.1	85.9	0.0	N/A	74.8	83.3	N/A	79.9	84.8	86.9	73.9	70.0	77.7	52.9	66.9
	-8	89.0	82.8	88.7	84.9	0.0	N/A	73.1	N/A	75.4	78.2	82.3	80.9	67.1	68.3	75.9	50.1	64.9
	-6	89.4	83.0	88.6	85.2	0.0	N/A	74.1	N/A	76.3	78.0	82.9	81.6	68.0	69.3	76.4	50.9	65.4
	-4	89.9	83.6	88.7	84.7	0.0	N/A	74.6	N/A	76.5	78.3	83.0	81.7	68.2	69.2	76.0	50.7	65.5
	-2	90.1	84.0	89.6	85.3	0.0	N/A	75.8	N/A	77.9	78.6	83.4	82.2	69.4	70.1	76.3	51.7	65.9
	0	90.9	83.8	88.7	85.7	0.0	N/A	77.0	N/A	78.8	80.0	84.1	82.6	70.7	70.0	75.6	51.8	65.3
	2	90.5	83.3	88.3	85.7	0.0	N/A	76.4	N/A	78.1	79.1	83.4	82.4	70.6	70.0	73.6	52.1	65.1
	4	87.9	80.0	85.6	85.1	0.0	N/A	71.5	N/A	73.8	78.1	81.8	78.9	66.4	68.0	69.8	48.7	62.1
	6	87.3	78.8	84.7	84.4	0.0	N/A	68.1	N/A	71.6	77.2	81.4	77.4	64.2	67.6	68.6	47.1	61.5
	8	87.4	79.3	85.2	84.0	0.0	N/A	67.3	N/A	71.7	76.6	81.1	77.9	63.9	67.6	68.9	46.9	60.8
30	-10	87.6	80.4	86.3	83.9	0.0	N/A	67.4	N/A	72.2	76.8	81.6	78.9	64.2	68.0	69.9	47.7	61.1
	-8	88.1	81.7	87.7	84.0	0.0	N/A	68.8	N/A	73.6	77.4	82.2	80.0	65.0	68.6	71.7	49.0	61.9
	-6	89.4	83.1	90.3	86.5	N/A	N/A	74.2	N/A	74.4	78.1	82.5	81.3	65.4	68.3	77.9	50.9	64.7
	-4	89.5	83.4	90.3	87.1	N/A	N/A	75.8	N/A	75.2	78.7	82.9	81.6	66.8	69.2	78.0	52.2	66.1
	-2	90.7	84.0	90.1	86.5	N/A	N/A	76.5	N/A	76.2	78.8	83.0	81.8	67.7	69.0	78.4	52.1	66.2
	0	90.3	84.2	90.7	86.2	N/A	N/A	76.9	N/A	76.2	79.3	83.4	82.0	68.2	69.3	77.9	52.3	66.4
	2	90.9	84.3	90.9	87.2	N/A	N/A	77.7	N/A	77.5	80.2	84.6	83.0	69.6	70.4	78.1	53.2	67.0
	4	90.8	84.4	90.8	87.5	N/A	N/A	77.8	N/A	77.8	80.3	83.9	82.8	69.7	70.1	77.9	53.8	67.0
	6	91.4	84.5	90.8	87.4	N/A	N/A	78.3	N/A	78.7	80.9	84.5	82.9	70.0	71.2	77.8	53.8	66.9
	8	89.3	81.6	88.7	86.8	N/A	N/A	74.0	N/A	73.9	79.0	83.0	80.1	66.6	68.9	73.8	50.7	64.0
40	-10	87.8	78.9	87.1	86.4	N/A	N/A	69.8	N/A	70.5	77.8	81.7	78.0	63.0	67.3	70.8	48.3	62.4
	-8	86.9	78.3	86.5	86.1	N/A	N/A	68.0	N/A	69.4	77.2	81.4	77.3	62.0	67.1	70.0	47.3	60.9
	-6	86.9	78.5	86.9	85.8	N/A	N/A	67.5	N/A	69.2	76.8	81.2	77.4	61.7	67.2	70.8	47.6	60.8
	-4	89.4	82.5	91.0	86.2	N/A	N/A	76.8	N/A	73.3	79.4	83.2	81.3	65.7	68.7	78.6	51.7	65.4
	-2	89.5	82.9	90.9	85.6	N/A	N/A	76.1	N/A	73.6	79.0	83.3	81.1	65.7	68.9	79.1	51.4	66.1
	0	90.0	82.7	91.3	86.2	N/A	N/A	77.2	N/A	74.6	79.5	83.6	82.2	66.8	68.9	79.1	51.8	66.3
	2	90.2	83.5	91.6	86.7	N/A	N/A	78.2	N/A	76.2	80.5	84.5	82.1	68.1	70.0	79.4	52.9	67.1
	4	90.4	83.7	91.8	86.6	N/A	N/A	79.1	N/A	76.4	81.4	84.8	82.6	69.2	70.8	79.9	53.8	67.7
	6	90.5	83.9	91.9	86.5	N/A	N/A	79.7	N/A	77.0	81.3	84.6	82.9	68.9	71.1	79.9	54.2	67.6
	8	91.0	84.2	92.2	86.9	N/A	N/A	79.6	N/A	77.0	81.8	84.9	83.4	69.5	71.3	80.0	53.4	67.9
40	-10	91.4	83.4	91.6	86.8	N/A	N/A	79.1	N/A	77.0	81.0	84.6	82.9	68.8	70.2	79.1	52.7	67.6
	-8	89.5	82.0	90.1	86.9	N/A	N/A	76.6	N/A	74.5	80.5	84.4	81.3	67.5	69.2	76.2	52.0	65.2
	-6	88.2	79.3	88.6	86.4	N/A	N/A	73.2	N/A	70.7	79.0	82.7	78.9	64.0	67.5	73.2	50.1	63.1
	-4	86.5	76.9	87.0	86.0	N/A	N/A	70.5	N/A	67.8	77.9	81.5	76.7	61.4	66.9	71.2	47.4	60.7

3.5 I5

Coverage	Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
10	-10	84.4	76.0	86.9	76.2	N/A	N/A	90.8	N/A	N/A	83.1	86.8	81.3	71.0	74.3	75.9	52.5	N/A
	-8	83.9	77.5	87.1	76.9	N/A	N/A	92.4	N/A	N/A	85.7	87.7	80.4	69.3	74.2	76.7	53.4	N/A
	-6	85.3	78.3	88.6	78.5	N/A	N/A	92.8	N/A	N/A	86.7	88.0	82.0	70.6	74.9	77.9	53.9	N/A
	-4	87.1	79.7	90.4	80.6	N/A	N/A	93.6	N/A	N/A	87.9	89.1	84.6	74.3	76.8	80.3	55.7	N/A
	-2	89.4	80.8	92.1	83.4	N/A	N/A	94.2	N/A	N/A	88.5	89.6	87.1	78.8	79.0	83.3	57.8	N/A
	0	78.2	74.9	83.9	72.4	N/A	N/A	91.3	N/A	N/A	84.5	87.4	76.4	64.0	71.0	71.5	49.3	N/A
	2	83.9	79.5	88.9	77.8	N/A	N/A	94.0	N/A	N/A	88.2	89.1	80.5	67.8	75.0	76.8	53.4	N/A
	4	91.4	81.6	93.4	85.0	N/A	N/A	94.5	N/A	N/A	89.3	89.9	88.9	81.4	79.8	85.4	59.0	N/A
	6	94.1	82.1	94.9	87.9	N/A	N/A	94.7	N/A	N/A	89.7	90.2	92.8	87.6	82.6	88.9	61.0	N/A
	8	95.1	82.3	95.2	88.9	N/A	N/A	94.9	N/A	N/A	90.0	90.4	94.0	89.3	84.2	90.1	61.4	N/A
20	-10	95.5	82.5	95.3	89.3	N/A	N/A	94.9	N/A	N/A	90.1	90.6	94.4	89.8	85.2	90.5	61.5	N/A
	-8	94.9	89.9	93.6	87.5	N/A	N/A	N/A	N/A	87.3	88.8	89.6	93.5	87.0	84.2	90.3	61.2	N/A
	-6	95.4	90.5	94.6	88.1	N/A	N/A	N/A	N/A	88.7	89.5	90.0	94.0	88.0	85.0	91.5	61.6	N/A
	-4	95.9	91.1	95.3	88.8	N/A	N/A	N/A	N/A	89.6	89.8	90.2	94.5	88.6	85.5	92.5	61.8	N/A
	-2	96.1	91.4	95.6	89.1	N/A	N/A	N/A	N/A	90.5	90.2	90.6	94.8	89.1	86.0	93.2	62.2	N/A
	0	96.4	92.0	96.1	89.4	N/A	N/A	N/A	N/A	91.4	90.4	90.7	95.0	89.6	86.3	93.9	62.6	N/A
	2	95.6	90.8	95.1	88.8	N/A	N/A	N/A	N/A	90.2	90.0	90.5	94.3	88.4	86.2	92.8	61.9	N/A
	4	94.9	89.4	93.3	88.5	N/A	N/A	N/A	N/A	86.4	90.3	90.6	93.2	86.1	85.3	89.7	61.3	N/A
	6	95.1	89.4	93.4	88.6	N/A	N/A	N/A	N/A	85.5	90.2	90.6	93.6	87.0	84.8	88.8	61.4	N/A
	8	95.7	91.0	95.1	89.0	N/A	N/A	N/A	N/A	88.0	90.1	90.5	94.5	88.7	85.4	91.3	61.9	N/A
30	-10	96.3	91.9	96.2	89.3	N/A	N/A	N/A	N/A	90.7	90.4	90.7	95.2	89.7	86.1	93.5	62.2	N/A
	-8	96.6	92.3	96.5	89.6	N/A	N/A	N/A	N/A	92.2	90.6	90.9	95.4	90.1	86.8	94.7	62.3	N/A
	-6	96.2	92.0	96.3	88.5	N/A	N/A	N/A	N/A	92.5	89.4	89.9	94.6	88.6	85.9	94.4	61.7	N/A
	-4	96.4	92.4	96.9	89.1	N/A	N/A	N/A	N/A	92.9	90.0	90.3	94.8	89.3	86.6	94.9	62.1	N/A
	-2	96.5	92.8	97.2	89.2	N/A	N/A	N/A	N/A	93.3	90.1	90.7	95.0	89.5	86.9	95.2	62.5	N/A
	0	96.6	92.8	97.3	89.3	N/A	N/A	N/A	N/A	93.5	90.4	90.9	95.0	89.7	87.0	95.5	62.5	N/A
	2	96.9	93.1	97.5	89.7	N/A	N/A	N/A	N/A	93.8	90.6	91.1	95.2	90.1	87.4	95.8	62.7	N/A
	4	96.7	92.7	97.1	89.6	N/A	N/A	N/A	N/A	93.5	90.5	90.9	95.0	89.9	87.4	95.5	62.4	N/A
	6	96.7	92.4	96.4	89.9	N/A	N/A	N/A	N/A	92.8	90.6	90.8	94.8	89.2	87.5	94.9	62.2	N/A
	8	96.7	92.1	95.7	90.3	N/A	N/A	N/A	N/A	92.3	91.1	90.9	94.8	89.2	87.6	94.2	62.2	N/A
40	-10	96.6	92.4	95.3	90.3	N/A	N/A	N/A	N/A	92.3	91.1	91.0	95.0	89.7	87.2	94.0	62.4	N/A
	-8	96.5	92.7	96.0	89.7	N/A	N/A	N/A	N/A	92.7	90.5	90.9	95.0	89.5	86.7	94.4	62.4	N/A
	-6	96.4	92.7	96.9	89.4	N/A	N/A	N/A	N/A	93.1	90.3	90.8	95.1	89.6	86.6	95.0	62.1	N/A
	-4	96.4	92.9	97.1	88.4	N/A	N/A	N/A	N/A	93.0	89.7	90.2	94.5	89.0	86.3	95.2	62.3	N/A
	-2	96.6	93.4	97.5	89.0	N/A	N/A	N/A	N/A	93.4	90.1	90.5	94.8	89.4	86.8	95.6	62.3	N/A
	0	96.7	93.4	97.5	89.2	N/A	N/A	N/A	N/A	93.6	90.3	90.7	94.9	89.6	87.1	95.7	62.5	N/A
	2	96.9	93.5	97.6	89.5	N/A	N/A	N/A	N/A	93.9	90.7	91.0	95.0	90.0	87.5	95.9	62.7	N/A
	4	97.0	93.6	97.6	89.6	N/A	N/A	N/A	N/A	94.0	90.7	91.1	95.1	90.1	87.6	96.0	62.7	N/A
	6	96.9	93.4	97.5	89.8	N/A	N/A	N/A	N/A	94.0	90.7	91.0	95.1	90.0	87.8	96.0	62.5	N/A
	8	97.0	93.2	97.1	90.0	N/A	N/A	N/A	N/A	93.7	90.7	91.0	94.9	89.9	87.8	95.5	62.5	N/A
40	-10	97.1	92.9	96.8	90.3	N/A	N/A	N/A	N/A	93.7	91.0	91.2	94.9	90.0	88.1	95.1	62.6	N/A
	-8	97.2	92.7	96.7	90.8	N/A	N/A	N/A	N/A	94.0	91.5	91.5	95.1	90.4	88.4	94.8	62.9	N/A
	-6	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	-4	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	-2	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	0	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	2	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	4	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	6	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A
	8	97.2	92.8	96.6	91.0	N/A	N/A	N/A	N/A	94.1	91.8	91.7	95.2	90.9	88.5	94.6	62.9	N/A

3.6 I6

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
-10	4.8	9.5	4.8	4.8	0.0	0.0	4.8	0.0	0.0	0.0	4.8	50.0	0.0	0.0	0.0	4.8	0.0
-8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-6	0.0	0.0	6.2	0.0	0.0	18.8	0.0	6.2	0.0	0.0	6.2	25.0	12.5	12.5	0.0	0.0	0.0
-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0	41.7	41.7	33.3	16.7	0.0	50.0	41.7	0.0	25.0	25.0	41.7	25.0	25.0	8.3	0.0	0.0	0.0
2	18.2	9.1	13.6	9.1	4.5	9.1	9.1	9.1	4.5	4.5	18.2	19.0	13.6	9.1	9.1	0.0	4.5
4	14.3	14.3	42.9	14.3	0.0	0.0	14.3	0.0	0.0	0.0	42.9	0.0	0.0	0.0	0.0	14.3	0.0
6	20.0	60.0	60.0	100.0	20.0	40.0	60.0	40.0	40.0	60.0	60.0	40.0	20.0	20.0	20.0	40.0	20.0
8	46.2	69.2	84.6	69.2	0.0	61.5	69.2	69.2	53.8	61.5	84.6	61.5	46.2	30.8	46.2	15.4	7.7
10	63.6	65.9	63.6	77.3	18.2	65.9	65.9	56.8	43.2	45.5	47.7	55.8	38.6	25.0	27.3	25.0	29.5

4. Sensitivity vs Positions in Reads

4.1 I1-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	83.4	94.9	96.5	96.1	95.8	66.1	99.3	91.5	N/A	97.9	93.5	95.8	84.3	91.0	93.8	0.0	0.0
4	88.6	94.5	97.3	96.0	98.3	72.0	99.6	94.5	N/A	98.3	96.2	96.2	87.8	85.5	94.5	0.0	4.0
6	88.0	95.1	96.2	97.6	98.0	73.7	98.9	93.8	N/A	97.8	95.8	96.4	86.6	84.2	94.2	0.0	6.9
8	89.8	94.5	96.9	96.6	96.6	70.4	99.0	92.1	N/A	97.6	95.5	96.8	85.3	81.9	95.0	0.0	5.5
10	89.2	94.6	97.2	97.4	96.9	74.6	99.5	92.7	N/A	99.1	95.8	96.5	85.4	85.9	94.4	90.8	4.2
12	89.1	93.0	95.5	92.7	96.1	77.0	98.4	91.8	N/A	98.0	93.0	94.8	85.0	85.7	92.0	87.7	5.2
14	90.9	95.3	96.6	94.5	96.6	80.4	99.4	93.3	N/A	98.6	93.7	96.0	87.2	86.8	94.5	88.9	5.1
16	92.4	94.8	95.7	95.5	98.4	80.9	99.1	94.6	N/A	98.2	94.6	97.1	86.3	86.3	94.2	89.4	6.1
18	87.8	92.7	95.3	94.4	97.6	79.7	98.7	91.9	N/A	98.1	94.4	95.7	85.3	84.0	91.7	89.3	5.6
20	89.2	93.6	96.1	94.3	97.7	80.3	99.5	94.3	N/A	98.4	94.3	95.4	86.3	85.1	92.4	90.1	8.5
22	91.0	94.6	99.0	96.3	98.5	81.6	99.8	96.4	N/A	98.5	93.4	96.6	88.9	87.6	92.7	90.3	7.0
24	89.2	93.3	99.0	94.9	98.0	81.5	99.8	95.1	N/A	97.8	93.8	95.8	87.7	93.6	94.1	88.9	8.6
26	92.2	94.8	98.6	96.7	98.3	82.2	99.2	95.6	N/A	98.9	93.6	96.9	90.8	90.9	94.8	89.5	6.7
28	91.7	95.0	98.8	97.3	98.5	88.0	99.4	95.3	N/A	98.2	93.9	96.3	90.4	93.5	95.6	91.9	7.0
30	90.9	94.7	98.5	97.1	98.2	86.3	98.8	95.8	N/A	98.0	95.1	96.8	91.3	93.0	95.2	92.6	6.7
32	91.8	93.3	98.8	97.0	98.0	85.7	99.3	95.1	N/A	98.1	93.8	97.0	91.2	92.8	95.2	90.1	8.8
34	90.4	94.3	98.4	96.9	98.5	86.2	99.1	96.2	N/A	98.0	94.7	96.2	90.9	93.2	95.2	92.6	11.1
36	93.7	96.7	98.3	98.1	98.9	87.3	99.6	97.1	N/A	98.2	93.6	97.0	91.0	93.0	95.4	93.0	8.9
38	91.9	95.2	99.3	97.0	98.6	85.1	99.4	96.2	N/A	98.9	95.2	96.5	90.9	93.6	96.0	92.2	9.3
40	91.1	94.9	98.4	97.1	98.5	87.5	99.1	95.5	N/A	98.4	93.2	97.0	90.4	93.2	95.8	92.4	10.6
42	91.7	95.5	98.6	96.6	98.1	87.1	98.9	96.2	N/A	98.9	93.3	96.2	90.1	91.3	96.1	91.5	8.4
44	92.0	94.6	96.9	96.3	98.3	88.2	98.6	96.8	N/A	97.8	91.6	96.2	90.1	93.0	95.3	93.2	9.5
46	92.8	94.5	98.7	96.6	97.8	86.3	99.0	94.3	N/A	98.9	92.7	95.7	89.2	94.4	95.2	91.0	8.9
48	92.3	95.1	98.4	92.8	98.7	86.6	98.9	95.1	N/A	98.7	96.9	96.3	90.0	92.4	95.9	92.5	8.9
50	92.0	95.7	97.9	93.0	98.4	86.7	99.2	95.9	N/A	98.9	96.8	96.4	90.4	91.3	96.0	92.9	9.9
52	92.2	94.7	98.1	92.8	98.2	87.2	99.4	95.7	N/A	98.3	97.6	96.4	91.4	92.1	96.7	92.1	7.7
54	91.5	94.4	97.9	94.4	98.1	84.4	99.0	95.7	N/A	98.3	97.5	96.7	91.0	91.5	95.0	91.5	7.4
56	91.4	94.8	97.8	92.3	98.0	83.8	98.5	94.9	N/A	98.0	97.1	96.2	89.9	92.3	95.4	91.1	8.1
58	91.4	93.9	98.1	92.9	98.3	86.0	99.2	95.8	N/A	98.4	97.5	96.5	90.4	89.8	95.3	89.6	7.4
60	92.2	92.9	98.7	93.5	98.0	86.5	98.9	95.9	N/A	98.5	97.3	96.3	91.4	91.6	96.2	90.2	7.0
62	92.1	93.2	98.1	92.6	98.0	85.7	99.2	94.1	N/A	98.2	97.4	95.4	89.1	89.7	95.6	89.2	7.1
64	92.9	92.9	98.6	92.7	98.3	86.7	99.3	96.1	N/A	98.6	98.2	95.9	91.9	90.4	96.0	89.4	8.1
66	92.4	93.8	98.5	93.0	98.1	87.3	98.7	96.1	N/A	98.5	97.6	97.4	91.1	91.7	96.1	90.5	7.5
68	92.5	93.5	97.6	92.8	98.2	85.7	98.8	94.9	N/A	97.7	97.2	96.3	90.4	91.0	95.1	88.6	7.8
70	92.0	93.2	98.0	93.1	98.0	87.0	98.3	95.6	N/A	98.1	97.9	96.2	91.2	90.1	96.1	88.8	7.0
72	91.9	93.8	98.5	93.5	98.0	88.3	99.5	95.6	N/A	98.3	98.0	97.1	91.1	90.9	96.2	88.9	7.7
74	91.6	92.9	97.8	92.8	97.8	88.1	99.0	95.0	N/A	98.2	98.2	96.8	89.6	90.2	95.7	88.1	8.4
76	91.2	91.9	98.2	92.6	98.0	85.8	98.7	95.3	N/A	97.9	98.0	95.9	89.5	89.5	95.2	85.9	8.5
78	91.7	92.4	97.9	93.0	98.1	86.1	98.6	95.4	N/A	97.8	98.4	96.4	89.9	91.8	96.0	86.3	8.6
80	91.7	92.5	96.0	93.0	97.8	85.5	98.7	95.0	N/A	97.5	98.2	96.2	89.6	89.7	94.2	85.8	7.2
82	91.9	92.0	96.4	93.1	97.3	84.7	98.5	92.8	N/A	98.1	98.4	96.3	85.8	87.5	94.0	84.7	6.4
84	92.8	91.4	96.5	93.1	97.6	84.3	98.4	93.3	N/A	97.6	98.8	96.7	86.0	88.0	94.1	82.6	8.3
86	91.9	91.5	95.7	92.7	97.2	83.4	98.4	92.1	N/A	97.1	98.4	96.2	84.9	88.1	93.3	81.6	7.9
88	91.9	90.6	96.5	92.9	97.5	82.3	97.8	92.8	N/A	98.1	98.7	97.0	85.8	89.1	94.2	81.5	7.2
90	91.4	91.4	96.5	93.2	97.4	82.3	97.8	93.0	N/A	97.3	98.8	96.7	86.1	87.3	94.0	80.4	7.8
92	92.6	90.9	96.9	93.8	97.8	82.5	98.0	93.0	N/A	97.4	98.7	96.9	86.9	86.1	94.9	80.3	7.6
94	91.8	90.2	96.6	92.8	97.3	80.0	98.2	92.3	N/A	96.9	98.1	96.5	85.1	86.7	94.3	0.0	7.0
96	91.6	89.9	96.9	92.3	97.4	78.3	98.2	91.8	N/A	97.4	98.2	96.6	84.7	85.3	93.9	0.0	7.1
98	91.3	90.5	96.7	92.9	96.9	76.7	98.5	92.6	N/A	97.1	98.0	97.1	84.7	85.7	94.2	0.0	6.6
100	91.5	91.7	96.3	92.0	96.8	76.4	98.4	92.0	N/A	96.9	96.1	96.4	85.3	70.4	93.7	0.0	0.0

4.2 I1-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	98.3	98.4	99.2	97.7	95.9	90.2	100.0	98.8	95.9	98.6	95.2	99.5	98.3	89.5	98.4	0.0	33.2
4	98.6	98.8	99.7	98.9	95.9	90.4	100.0	99.1	97.0	98.5	96.0	99.8	97.8	86.1	98.7	0.0	45.6
6	99.5	99.3	99.6	99.0	96.6	89.3	99.8	99.4	97.3	98.7	97.7	99.8	97.7	85.0	98.8	0.0	49.6
8	98.4	99.0	99.0	99.1	96.2	90.9	100.0	98.6	96.6	98.5	97.5	99.7	97.5	83.5	99.0	0.0	53.2
10	99.3	98.8	99.4	99.5	97.7	90.8	99.8	98.9	96.4	98.5	98.3	99.9	98.2	87.1	99.3	94.3	53.6
12	98.9	97.9	99.1	98.7	96.2	91.0	99.5	98.2	97.2	98.5	96.7	99.3	97.1	90.5	98.4	93.1	52.1
14	99.2	98.4	99.0	98.2	97.3	91.2	99.9	98.2	96.6	98.0	97.2	99.6	97.8	89.8	98.5	94.3	55.3
16	99.1	98.6	99.2	98.4	96.6	90.9	99.8	98.8	97.2	97.7	96.9	99.6	97.9	85.9	97.9	93.5	59.0
18	99.3	98.5	99.1	98.9	97.8	92.5	99.8	98.7	97.1	98.3	96.7	99.5	98.1	89.6	99.1	94.8	53.1
20	99.4	98.1	99.1	99.1	97.6	90.5	99.8	99.1	97.6	98.6	97.4	99.7	98.5	90.1	99.3	95.5	56.8
22	99.2	98.5	99.7	99.0	98.0	91.9	99.7	99.3	96.7	98.2	97.4	99.7	98.5	91.8	98.9	94.9	58.8
24	98.9	98.8	99.8	99.0	97.8	90.7	99.8	99.6	97.8	97.7	97.8	99.7	98.8	97.5	98.8	95.5	59.7
26	99.0	98.5	99.8	99.5	97.6	87.5	100.0	99.0	96.6	97.7	96.8	99.8	98.4	96.8	99.3	94.1	58.6
28	99.2	98.5	99.8	99.2	98.1	88.1	99.9	99.4	97.5	97.7	97.2	99.9	99.0	96.6	99.5	96.0	62.0
30	99.4	98.7	99.7	99.5	97.7	86.1	100.0	99.1	97.1	97.6	96.7	99.4	98.6	97.3	98.9	95.9	59.7
32	99.4	98.5	99.9	99.5	97.7	85.0	99.9	99.8	98.1	97.3	96.2	99.8	99.6	96.6	99.4	95.9	85.4
34	99.2	98.2	99.7	99.2	97.6	84.6	99.7	99.5	97.4	97.8	96.2	99.5	98.9	98.0	99.0	95.8	77.4
36	99.3	97.9	99.9	99.7	98.2	83.8	99.8	99.7	98.2	97.5	96.5	99.8	99.3	97.6	99.1	95.6	76.9
38	99.5	98.2	99.8	99.5	98.0	83.0	99.9	99.2	98.0	97.6	96.4	99.7	98.9	96.4	98.9	95.7	73.3
40	99.6	98.6	99.9	99.7	98.4	84.5	99.9	99.8	98.2	97.6	96.5	99.8	98.8	97.0	99.1	96.2	77.7
42	99.2	98.2	99.8	99.8	97.2	84.7	99.8	99.3	97.6	98.0	95.8	99.6	98.9	96.6	99.2	96.0	79.4
44	99.5	98.3	99.8	99.7	97.6	84.6	99.9	99.7	98.2	97.6	95.3	99.6	99.2	96.9	99.0	96.6	76.6
46	99.3	97.9	99.6	99.6	98.1	84.7	99.9	99.5	98.2	97.2	96.1	99.8	98.9	96.3	98.8	96.6	77.3
48	99.4	98.2	99.9	99.5	98.4	84.1	99.9	99.7	98.2	98.1	98.6	99.9	99.2	97.0	99.5	95.9	77.3
50	99.1	98.6	99.5	99.3	97.5	84.8	99.8	99.4	97.8	97.5	97.9	99.4	98.8	96.2	98.9	95.8	75.2
52	99.2	98.4	99.6	99.5	97.6	83.7	99.9	99.5	98.0	97.9	98.9	99.6	98.9	96.1	99.2	95.7	63.2
54	99.2	98.0	99.7	99.4	98.2	84.2	99.9	99.6	98.4	97.3	98.4	99.6	99.4	95.7	99.1	95.3	63.0
56	99.4	97.7	99.7	99.3	97.7	83.7	99.9	99.5	98.4	98.2	98.3	99.8	98.9	96.9	99.3	94.9	61.8
58	99.3	97.3	99.8	99.2	97.7	85.0	99.8	99.6	98.0	97.3	98.7	99.6	99.1	96.4	99.2	95.0	61.7
60	99.2	97.4	99.8	99.4	97.7	84.2	99.8	99.5	97.7	97.6	98.5	99.6	98.9	95.4	99.2	94.1	62.7
62	99.5	97.5	99.5	99.5	97.5	83.9	99.9	99.5	97.7	97.9	98.9	99.7	99.0	95.9	99.3	93.7	65.3
64	99.5	97.8	99.5	99.5	97.7	85.2	99.9	99.6	97.7	97.2	98.6	99.6	99.2	95.5	99.4	94.5	64.5
66	99.3	97.5	99.7	99.4	97.6	83.4	99.9	99.6	97.9	97.7	98.7	99.6	98.8	96.4	99.3	93.3	65.5
68	99.3	97.1	99.5	99.4	97.7	86.7	99.8	99.5	97.6	97.3	98.5	99.8	99.1	96.5	99.2	92.9	65.6
70	98.9	96.5	99.3	99.0	97.7	86.6	99.7	99.2	97.3	96.9	98.6	99.6	98.8	95.2	99.0	92.7	64.7
72	99.4	96.5	99.6	99.4	98.0	87.3	99.8	99.6	97.5	97.8	99.0	99.7	99.0	94.6	99.3	91.7	66.9
74	99.4	96.8	99.7	99.4	97.9	88.5	99.7	99.4	97.1	97.4	99.2	99.7	98.7	95.4	99.3	92.0	66.0
76	99.2	96.6	99.6	99.3	97.7	89.3	99.6	99.3	96.4	97.0	99.2	99.6	98.9	95.6	99.0	90.5	65.9
78	99.3	96.7	99.6	99.3	97.2	90.0	99.9	99.3	96.9	98.1	99.3	99.8	98.8	96.4	99.2	90.3	65.2
80	99.4	96.0	99.5	99.5	97.6	90.6	99.6	99.2	97.0	98.0	99.6	99.7	98.7	95.1	99.1	90.0	66.9
82	99.3	95.9	99.4	99.4	97.4	91.5	99.6	99.1	97.1	97.6	99.5	99.7	97.9	94.5	99.2	89.0	64.8
84	99.2	95.5	99.2	99.2	96.4	92.5	99.4	98.7	96.4	97.7	99.2	99.6	97.7	94.0	98.9	87.7	64.3
86	99.3	95.6	99.3	99.5	96.2	92.1	99.4	98.8	97.2	97.8	99.5	99.7	98.1	94.5	99.2	86.8	66.9
88	99.3	94.8	99.2	99.3	96.2	92.2	99.3	98.7	96.8	97.7	99.5	99.7	97.7	94.5	99.2	85.5	66.2
90	99.1	95.2	99.2	99.3	96.1	92.1	99.4	98.4	96.6	97.8	99.6	99.8	97.8	94.7	99.2	84.8	64.8
92	99.2	94.6	99.4	99.4	96.2	92.3	99.3	98.6	96.7	97.6	99.6	99.7	97.9	93.3	99.2	84.4	65.3
94	99.1	94.1	99.3	99.3	96.4	91.8	99.4	98.4	96.1	97.7	99.5	99.7	97.5	93.1	99.1	0.0	64.9
96	99.3	94.2	99.5	99.4	96.4	91.9	99.5	98.5	96.2	97.5	99.2	99.8	97.8	93.0	99.3	0.0	65.9
98	99.0	94.4	99.4	99.2	96.1	92.0	99.7	98.6	96.2	97.7	98.9	99.7	97.9	92.9	99.2	0.0	64.9
100	99.2	96.2	99.2	99.2	95.9	91.9	99.7	98.4	96.7	97.7	97.7	99.6	97.8	84.9	99.1	0.0	54.2

4.3 I1-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	99.5	99.5	99.7	98.8	97.5	91.7	100.0	99.4	99.0	99.8	95.0	99.8	99.0	88.9	99.5	0.0	36.6
4	99.4	98.6	99.5	99.5	97.1	92.6	99.6	99.5	98.8	99.3	95.9	99.6	99.3	87.0	99.0	0.0	50.4
6	99.8	98.9	100.0	99.8	97.5	89.2	99.7	99.8	99.8	99.9	97.4	99.9	99.8	83.6	99.8	0.0	58.1
8	99.9	99.1	99.7	100.0	97.6	91.6	100.0	99.9	99.4	100.0	97.5	99.9	99.5	85.5	99.9	0.0	60.7
10	99.8	99.0	99.9	99.9	98.3	90.4	99.9	99.6	99.4	99.9	97.6	100.0	99.5	87.8	99.8	94.7	63.4
12	99.8	98.0	99.7	99.8	97.6	92.5	99.8	99.5	99.3	99.8	97.0	99.9	99.5	92.7	99.6	95.3	64.0
14	99.7	98.6	99.7	99.7	97.7	88.9	99.8	99.5	99.5	99.7	97.7	99.7	99.3	90.8	99.6	94.6	66.7
16	99.6	99.0	99.8	99.8	97.2	89.2	99.8	99.5	99.3	99.6	97.6	99.8	99.4	88.3	99.3	94.1	66.8
18	99.7	98.7	99.7	100.0	98.3	88.4	99.9	99.7	99.7	100.0	97.3	99.9	99.9	89.5	99.7	95.0	66.4
20	99.7	98.2	99.9	99.8	97.3	86.5	99.9	99.6	99.4	99.8	97.4	99.8	99.5	89.6	99.5	95.8	71.2
22	99.7	98.2	99.7	99.8	98.3	84.9	99.7	99.8	99.2	99.5	97.6	99.7	99.6	91.6	99.5	95.1	69.2
24	99.7	98.6	99.9	99.9	97.9	85.7	99.9	99.9	99.2	99.8	97.1	99.8	99.7	98.1	99.5	95.5	68.7
26	99.6	98.5	99.8	99.9	98.2	81.3	99.8	99.7	99.0	99.6	97.3	99.8	99.5	97.5	99.4	95.1	71.3
28	99.8	98.3	100.0	100.0	98.7	78.9	100.0	100.0	99.5	99.9	97.5	100.0	99.8	97.0	99.9	95.3	71.7
30	99.8	98.5	100.0	100.0	98.4	78.0	100.0	99.9	99.4	99.7	97.3	99.8	99.7	97.3	99.6	96.0	68.6
32	99.8	98.7	100.0	99.8	98.0	75.3	99.8	99.9	99.7	99.8	97.4	99.9	99.8	97.5	99.8	96.8	88.1
34	99.7	98.6	99.7	99.9	98.4	72.1	99.8	99.7	99.2	99.6	96.4	99.8	99.6	98.4	99.5	96.4	82.4
36	99.8	98.1	99.9	99.9	98.3	73.1	99.8	99.9	99.3	99.8	97.4	99.9	99.7	97.9	99.6	96.6	83.5
38	99.8	98.1	99.8	99.9	98.4	72.8	99.8	99.8	99.4	99.7	95.9	99.9	99.7	96.8	99.5	95.1	81.1
40	99.8	98.7	99.9	100.0	98.6	72.5	99.9	99.8	99.4	99.7	96.2	99.9	99.4	97.5	99.8	97.0	81.2
42	99.9	98.2	99.8	99.9	97.9	73.2	100.0	99.8	99.4	99.8	96.3	99.9	99.8	97.0	99.6	96.2	83.1
44	99.8	98.6	99.8	99.8	97.9	73.1	99.9	99.8	99.4	99.7	95.6	99.8	99.7	97.2	99.7	97.0	83.0
46	99.7	98.5	99.9	99.9	98.3	73.5	100.0	99.9	99.6	99.8	96.7	100.0	99.8	97.9	99.6	97.3	83.1
48	99.6	98.7	99.7	99.8	98.0	72.6	99.9	99.8	99.4	99.8	98.3	99.9	99.5	97.1	99.7	96.4	84.2
50	99.7	98.8	99.7	99.6	97.9	72.8	99.8	99.8	99.5	99.6	98.5	99.8	99.5	97.3	99.7	96.7	82.9
52	99.8	98.9	99.7	99.9	98.2	74.2	99.9	99.9	99.4	99.8	98.7	99.9	99.6	97.2	99.6	96.2	72.7
54	99.7	98.3	99.7	99.9	98.1	73.6	99.9	99.8	99.3	99.8	98.5	99.8	99.7	96.7	99.5	95.7	71.7
56	99.8	97.5	99.8	99.7	97.7	72.8	99.9	99.8	99.4	99.6	98.2	99.8	99.5	97.6	99.6	95.0	74.2
58	99.8	97.5	99.9	99.8	98.5	73.4	99.9	99.9	99.5	99.8	98.6	99.8	99.7	96.9	99.6	94.7	72.4
60	99.7	97.7	99.8	99.9	98.4	72.4	99.9	99.9	99.3	99.6	98.6	99.9	99.6	96.9	99.6	94.9	72.6
62	99.8	97.5	99.9	99.8	97.7	73.7	99.9	99.7	99.4	99.7	98.8	99.9	99.5	96.4	99.7	94.2	74.3
64	99.8	97.6	99.9	99.8	98.2	73.6	100.0	99.8	99.2	99.7	98.9	99.9	99.6	96.8	99.6	94.6	74.4
66	99.7	97.5	99.8	99.7	98.1	72.4	99.7	99.7	99.3	99.6	99.0	99.8	99.7	97.1	99.5	93.8	73.9
68	99.8	97.3	99.7	99.9	98.1	75.8	99.8	99.8	99.2	99.5	98.8	99.8	99.7	97.3	99.6	93.8	75.2
70	99.8	96.9	99.8	99.8	98.3	77.1	99.9	99.7	99.3	99.6	99.1	99.9	99.5	96.6	99.6	93.3	75.4
72	99.7	96.7	99.7	99.7	98.0	78.7	99.8	99.8	99.3	99.3	99.0	99.8	99.5	96.0	99.4	92.0	76.0
74	99.7	97.2	99.7	99.7	98.0	80.1	99.8	99.7	99.1	99.5	99.1	99.8	99.6	96.0	99.6	92.2	74.7
76	99.7	96.7	99.7	99.8	98.1	83.6	99.8	99.7	99.3	99.3	99.3	99.8	99.5	96.3	99.4	91.0	76.5
78	99.8	96.6	99.6	99.8	98.0	84.1	99.9	99.7	99.3	99.6	99.6	99.9	99.7	96.9	99.6	90.7	75.2
80	99.9	96.6	99.7	99.8	97.8	85.9	99.7	99.6	99.2	99.5	99.6	99.8	99.2	96.3	99.5	90.6	74.8
82	99.7	96.4	99.6	99.8	98.0	86.9	99.7	99.5	99.1	99.2	99.6	99.9	99.2	95.6	99.5	88.6	75.9
84	99.7	95.8	99.6	99.7	97.2	88.0	99.6	99.4	99.2	99.3	99.4	99.8	99.0	95.3	99.4	88.6	76.2
86	99.8	95.9	99.7	99.9	97.3	89.5	99.6	99.6	99.4	99.4	99.7	99.9	99.3	95.7	99.6	87.2	76.6
88	99.8	95.3	99.8	99.9	97.2	90.1	99.7	99.6	99.4	99.4	99.6	99.9	99.4	96.1	99.7	86.1	76.2
90	99.7	95.4	99.8	99.8	97.1	90.9	99.6	99.4	99.2	99.4	99.6	99.9	99.3	95.6	99.6	85.6	74.8
92	99.7	94.8	99.8	99.8	97.2	91.4	99.6	99.3	99.2	99.4	99.6	99.8	99.2	94.8	99.5	83.8	75.9
94	99.7	94.0	99.8	99.8	97.6	91.9	99.6	99.3	99.1	99.4	99.5	99.9	99.1	94.4	99.5	0.0	75.6
96	99.8	94.3	99.8	99.8	97.3	92.7	99.7	99.3	99.1	99.5	99.4	99.9	99.3	94.7	99.6	0.0	75.8
98	99.8	94.3	99.8	99.7	97.1	92.9	99.7	99.3	99.1	99.5	99.1	99.8	99.2	94.5	99.6	0.0	74.1
100	99.8	96.1	99.8	99.8	96.9	93.8	99.8	99.0	99.0	99.6	97.8	99.8	99.2	88.7	99.5	0.0	54.8

4.4 I1-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	99.9	99.8	99.6	98.4	97.4	95.0	99.9	99.8	99.1	99.8	96.7	99.8	99.5	88.4	99.7	0.0	38.9
4	99.9	99.3	99.8	99.8	98.3	93.9	99.8	99.8	99.6	99.9	98.4	100.0	99.9	86.4	99.8	0.0	56.2
6	99.8	98.7	99.8	99.9	97.5	93.4	99.9	99.7	99.5	99.7	97.9	99.9	99.6	84.2	99.7	0.0	65.3
8	99.6	98.4	99.6	99.8	98.0	90.9	99.8	99.5	99.3	99.4	97.3	99.8	99.6	82.7	99.6	0.0	67.7
10	99.9	98.9	99.7	99.9	97.1	92.1	100.0	99.6	99.6	99.8	97.9	100.0	99.8	86.8	99.6	95.6	68.2
12	99.9	98.9	99.8	100.0	97.3	90.5	100.0	99.8	99.7	99.8	97.4	99.8	99.7	92.0	99.7	95.5	70.9
14	100.0	99.1	99.7	100.0	97.5	88.1	100.0	99.8	99.5	99.9	97.3	99.8	99.8	89.3	99.8	95.1	74.1
16	99.9	99.0	99.8	99.9	97.6	87.3	99.9	99.8	99.5	99.8	97.0	99.9	99.6	88.6	99.6	95.6	73.8
18	99.6	98.4	99.6	99.8	98.2	86.5	99.8	99.6	99.3	99.5	96.8	99.6	99.4	88.6	99.5	94.9	74.7
20	99.7	98.6	99.6	99.9	98.5	83.7	100.0	99.8	99.6	99.9	97.4	99.7	99.7	90.2	99.6	95.2	76.8
22	99.8	98.4	99.7	100.0	98.8	82.6	100.0	99.8	99.4	99.8	97.3	99.8	99.6	92.2	99.7	96.2	76.0
24	99.7	98.1	99.7	99.8	98.5	79.8	99.9	99.9	99.3	99.7	98.2	99.7	99.8	97.9	99.7	95.8	76.2
26	99.6	98.0	99.8	99.9	98.5	76.5	99.9	99.9	99.6	99.7	97.1	99.6	99.7	97.5	99.7	95.2	77.0
28	99.7	98.3	99.9	99.9	98.4	75.8	99.8	99.9	99.5	99.8	96.9	99.9	99.8	97.6	99.5	95.6	76.6
30	99.8	98.7	99.8	99.8	98.3	74.5	99.9	99.9	99.4	99.8	97.0	99.9	99.8	97.6	99.6	95.7	77.2
32	99.9	98.6	99.9	99.9	98.3	71.4	100.0	99.8	99.5	99.8	97.8	99.9	99.6	97.8	99.7	95.7	92.5
34	99.8	98.4	99.8	99.8	98.2	69.2	99.8	99.9	99.6	99.7	97.4	99.8	99.7	98.4	99.5	96.4	86.3
36	99.8	98.7	99.9	99.9	98.3	67.7	99.9	99.9	99.5	99.9	97.1	99.9	99.8	98.0	99.8	96.0	87.2
38	99.8	98.5	99.9	99.9	98.2	68.3	100.0	100.0	99.7	100.0	96.9	99.9	99.8	97.4	99.6	95.6	86.5
40	99.8	98.4	99.8	99.9	98.2	68.2	99.9	99.9	99.7	99.8	96.1	99.9	99.8	97.8	99.6	96.0	86.3
42	99.8	98.4	99.9	99.9	98.3	68.3	99.9	99.7	99.5	99.8	96.2	99.8	99.7	97.3	99.6	95.7	86.9
44	99.9	98.7	99.9	99.9	98.5	68.6	99.9	100.0	99.7	99.9	96.0	99.9	99.8	98.3	99.8	97.3	86.7
46	99.8	98.4	99.8	99.9	98.0	69.0	100.0	100.0	99.6	99.9	96.3	99.9	99.8	98.2	99.7	96.9	87.6
48	99.8	98.2	99.9	99.8	98.4	69.5	99.9	99.9	99.5	99.8	98.2	99.9	99.7	97.3	99.5	96.4	87.4
50	99.8	98.7	99.9	99.9	98.5	68.4	99.9	99.9	99.6	99.8	98.3	99.9	99.8	97.8	99.7	96.4	87.2
52	99.9	98.5	99.8	99.9	98.5	68.0	100.0	99.9	99.8	99.8	98.3	99.9	99.9	97.3	99.7	96.3	79.7
54	99.9	98.1	99.8	99.9	98.3	68.9	99.9	99.8	99.6	99.7	98.2	99.9	99.9	97.1	99.8	95.8	80.0
56	99.8	98.0	99.9	99.9	98.5	68.4	99.9	99.9	99.5	99.8	98.3	99.9	99.7	98.0	99.5	95.8	82.4
58	99.8	97.6	99.9	99.9	98.5	69.1	100.0	99.9	99.7	99.8	98.1	99.9	99.8	97.4	99.7	95.1	80.8
60	99.9	97.9	99.8	99.9	98.2	68.3	99.9	99.8	99.4	99.8	98.6	99.9	99.8	97.1	99.6	95.4	81.9
62	99.9	97.6	99.8	99.9	98.5	68.8	99.9	99.8	99.6	99.7	98.6	99.8	99.8	97.0	99.7	94.9	82.5
64	99.8	97.7	99.9	99.9	98.1	69.6	99.9	99.9	99.6	99.8	98.6	99.9	99.9	97.2	99.8	94.7	82.4
66	99.8	97.8	99.8	99.9	98.2	67.7	99.9	99.8	99.3	99.7	98.8	99.9	99.7	97.5	99.6	94.4	83.1
68	99.8	97.6	99.7	99.8	98.2	71.0	99.9	99.8	99.6	99.7	98.8	99.9	99.7	97.5	99.6	93.7	82.9
70	99.8	97.2	99.8	99.8	98.3	73.5	99.9	99.8	99.5	99.7	98.9	99.9	99.7	97.2	99.7	92.8	83.0
72	99.8	96.7	99.7	99.8	98.2	75.3	99.9	99.9	99.5	99.5	98.9	99.9	99.8	96.5	99.5	92.2	83.7
74	99.9	97.1	99.8	99.8	98.2	78.1	99.9	99.8	99.4	99.6	99.1	99.8	99.8	96.8	99.5	92.4	83.9
76	99.8	96.8	99.7	99.9	98.3	80.1	99.8	99.9	99.5	99.5	99.2	99.9	99.8	96.8	99.5	90.9	83.7
78	99.8	96.5	99.8	99.9	98.4	82.0	99.8	99.8	99.5	99.5	99.3	99.9	99.6	97.6	99.6	90.6	84.5
80	99.8	96.7	99.8	99.9	98.0	83.8	99.8	99.8	99.5	99.4	99.4	99.9	99.6	96.9	99.5	89.6	83.4
82	99.9	95.9	99.8	99.9	98.0	85.3	99.7	99.6	99.6	99.5	99.6	99.9	99.4	96.1	99.7	88.3	84.3
84	99.8	96.1	99.8	99.9	97.7	87.2	99.7	99.6	99.5	99.6	99.6	99.9	99.4	95.9	99.6	88.2	84.5
86	99.9	95.6	99.8	99.9	97.3	88.8	99.7	99.6	99.5	99.5	99.5	99.9	99.6	96.1	99.6	86.6	84.7
88	99.8	95.2	99.8	99.9	97.3	89.7	99.7	99.6	99.5	99.5	99.5	99.9	99.6	96.2	99.6	86.2	84.7
90	99.9	95.6	99.8	99.9	97.8	90.8	99.7	99.6	99.5	99.6	99.7	99.9	99.4	96.2	99.7	86.1	84.6
92	99.8	94.8	99.8	99.8	97.5	91.5	99.7	99.6	99.4	99.4	99.5	99.9	99.5	95.4	99.5	84.0	85.1
94	99.8	94.7	99.8	99.9	97.7	92.5	99.7	99.4	99.4	99.6	99.4	99.9	99.4	95.5	99.7	0.0	84.7
96	99.7	94.4	99.8	99.9	97.7	93.2	99.7	99.5	99.4	99.6	99.5	99.9	99.4	95.2	99.6	0.0	84.7
98	99.8	94.8	99.8	99.8	97.2	94.2	99.7	99.4	99.5	99.6	99.4	99.9	99.6	95.4	99.6	0.0	82.9
100	99.8	96.4	99.7	99.8	97.2	95.2	99.8	99.1	99.5	99.7	99.0	99.9	99.5	90.6	99.7	0.0	55.0

4.5 I2-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	86.9	95.6	97.4	94.7	97.2	77.9	99.6	93.9	N/A	98.0	93.2	96.9	86.0	87.7	96.5	0.0	0.0
4	88.7	96.7	98.7	98.4	97.8	84.9	99.3	96.0	N/A	98.9	96.5	98.0	89.8	84.7	96.7	0.0	5.3
6	91.3	96.6	97.2	96.0	97.0	83.2	99.1	94.4	N/A	98.3	96.0	97.7	88.1	80.0	95.9	0.0	5.5
8	93.8	96.5	96.9	96.5	98.6	83.7	99.4	94.4	N/A	99.0	96.9	96.9	87.8	82.0	96.5	0.0	3.9
10	92.2	95.8	97.6	96.5	96.9	84.9	99.3	95.1	N/A	97.8	95.5	97.5	85.3	84.2	95.8	92.2	4.0
12	92.1	95.8	97.2	96.6	97.4	86.4	99.2	95.1	N/A	98.7	95.5	97.0	88.1	89.2	96.8	89.1	6.6
14	93.0	95.4	97.0	96.6	96.6	89.4	99.1	93.7	N/A	98.5	96.1	96.9	88.5	89.7	95.7	90.3	4.8
16	93.9	95.4	96.5	97.4	98.5	86.4	98.9	94.6	N/A	98.0	95.0	96.8	87.7	86.1	95.9	90.9	4.8
18	95.0	97.3	97.6	98.3	98.8	92.8	99.5	95.5	N/A	98.8	96.4	97.8	89.7	89.7	96.4	93.5	4.3
20	94.2	95.4	97.6	97.5	98.8	93.1	99.7	97.0	N/A	98.7	97.0	96.7	87.9	90.5	96.0	92.2	4.6
22	94.9	97.1	99.1	99.0	99.4	93.1	99.9	98.0	N/A	98.7	94.5	99.0	94.3	96.4	98.0	92.7	5.2
24	94.6	97.7	99.4	98.4	99.2	94.6	99.7	98.3	N/A	99.0	94.9	98.7	95.1	97.5	98.0	92.9	4.2
26	93.8	97.0	98.8	98.9	98.2	93.6	99.8	97.3	N/A	99.0	95.7	97.7	93.8	96.7	98.3	93.3	4.6
28	95.2	97.0	99.0	98.9	99.0	95.9	99.4	98.4	N/A	99.1	95.8	98.9	95.5	96.8	97.6	94.4	4.5
30	93.8	95.6	98.8	99.4	98.4	94.7	99.4	98.0	N/A	98.8	94.9	97.8	93.9	97.0	97.7	93.7	6.4
32	95.4	96.8	98.9	98.5	98.8	95.1	99.5	97.8	N/A	98.0	96.1	97.7	93.9	97.3	97.8	93.5	4.3
34	94.7	96.7	99.1	98.8	98.8	95.8	99.3	98.0	N/A	98.0	96.3	97.9	94.8	97.2	97.8	95.2	5.5
36	95.6	96.2	99.2	98.6	98.7	96.0	99.2	98.3	N/A	99.0	94.4	97.8	95.0	96.3	98.4	93.8	6.0
38	95.6	96.3	98.8	99.1	98.8	95.7	99.4	98.1	N/A	98.8	95.3	98.1	94.4	96.7	97.6	92.5	4.4
40	94.9	97.1	99.5	98.9	98.7	96.2	99.4	97.7	N/A	98.5	96.3	98.2	94.3	97.3	97.7	94.2	5.3
42	95.3	96.4	98.9	98.7	99.1	96.2	99.3	97.7	N/A	98.3	94.7	98.1	93.4	97.8	97.9	92.8	6.3
44	95.4	96.1	98.8	98.4	98.5	96.7	99.5	98.2	N/A	98.5	94.3	97.2	94.0	97.5	97.7	93.3	7.1
46	94.6	96.6	99.5	98.9	98.9	96.3	99.4	98.7	N/A	99.1	97.7	98.7	95.0	96.8	98.0	94.2	6.2
48	95.6	97.3	98.9	96.9	98.5	96.6	99.3	98.4	N/A	98.4	97.7	98.1	94.6	97.1	97.3	95.4	6.0
50	94.2	97.0	98.8	95.6	98.2	96.8	99.7	97.7	N/A	98.8	97.7	97.1	94.1	97.2	97.5	93.4	7.4
52	95.0	96.2	98.1	96.3	99.0	96.1	99.2	98.3	N/A	98.3	98.0	97.4	94.0	96.8	97.9	93.5	6.2
54	93.6	95.6	98.6	95.6	98.6	95.8	99.3	97.8	N/A	98.1	97.7	97.4	93.6	95.7	97.1	92.2	4.8
56	94.6	95.5	99.0	96.8	98.7	96.9	99.1	98.2	N/A	98.2	96.9	98.4	94.0	94.9	97.2	91.3	4.8
58	95.1	95.3	98.6	96.3	98.8	97.0	99.7	97.7	N/A	98.8	98.6	97.5	93.3	96.7	97.9	91.1	5.0
60	95.0	94.8	98.7	95.8	98.4	96.0	99.6	97.8	N/A	98.6	98.1	97.5	94.0	97.5	97.3	91.8	5.2
62	94.5	95.6	98.7	96.5	98.5	97.0	99.1	98.1	N/A	98.4	98.0	98.3	94.1	96.6	97.8	91.3	5.0
64	95.6	95.4	99.0	96.9	99.0	96.6	99.4	98.9	N/A	98.7	99.0	98.3	94.3	96.4	98.0	92.1	5.6
66	95.0	95.0	98.9	97.1	98.6	95.9	99.1	97.9	N/A	98.4	98.7	97.9	94.2	95.4	98.0	91.7	5.8
68	94.7	95.2	98.5	96.4	99.2	95.9	99.2	97.9	N/A	98.4	97.7	98.4	93.8	95.4	98.1	89.7	5.1
70	94.3	95.2	99.1	96.3	98.9	96.4	99.2	98.0	N/A	98.4	98.8	98.0	93.6	96.7	98.2	90.4	4.9
72	95.5	94.3	98.8	96.9	98.7	96.0	99.0	97.8	N/A	98.5	98.9	98.3	93.8	95.8	98.1	89.8	5.9
74	95.1	94.4	98.9	96.8	98.8	95.9	98.9	97.9	N/A	98.4	98.9	98.0	94.1	95.3	98.1	89.5	5.1
76	94.7	95.1	99.2	96.9	98.8	95.6	99.2	98.1	N/A	99.1	99.3	98.2	93.0	95.4	98.1	87.5	4.2
78	94.4	94.6	98.9	96.7	98.8	95.3	99.1	97.1	N/A	98.2	99.1	97.9	92.9	95.7	98.1	87.2	6.0
80	94.4	94.1	98.5	96.6	98.5	94.4	98.9	96.9	N/A	98.5	99.1	98.2	92.0	95.8	96.1	86.2	5.1
82	94.9	93.1	97.3	96.3	98.4	94.3	98.7	95.4	N/A	98.4	99.0	97.9	89.5	95.0	96.4	85.4	5.1
84	94.5	93.3	97.6	96.7	97.7	94.0	98.3	94.7	N/A	98.0	99.0	98.2	88.3	95.2	96.3	84.3	4.9
86	94.7	93.8	98.1	96.7	97.8	94.0	97.9	95.4	N/A	98.0	99.1	98.4	88.9	94.6	96.5	83.3	5.3
88	94.8	93.2	98.1	96.5	97.8	93.5	98.3	94.6	N/A	98.4	99.3	98.0	88.0	94.8	96.5	81.7	4.5
90	94.1	93.2	97.4	96.6	98.1	93.0	98.1	95.5	N/A	97.9	99.0	98.1	88.8	95.4	96.8	82.3	5.2
92	94.6	92.7	98.0	96.6	98.2	92.7	98.3	95.4	N/A	98.2	99.3	98.2	88.5	94.9	96.4	79.9	5.3
94	94.7	91.5	97.9	96.7	97.7	92.2	98.0	95.1	N/A	97.9	99.0	98.3	88.6	93.9	96.6	0.0	5.1
96	94.7	91.6	97.9	96.4	98.4	91.0	98.4	94.9	N/A	97.9	98.5	98.2	88.5	93.8	96.8	0.0	4.9
98	94.3	91.7	97.8	95.9	97.6	90.3	98.7	94.9	N/A	97.9	98.5	98.1	88.3	93.4	96.5	0.0	4.7
100	94.4	92.9	98.1	96.0	97.3	89.2	98.8	95.2	N/A	98.0	97.1	98.0	87.9	94.7	96.7	0.0	0.0

4.6 I2-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	99.4	99.4	99.8	96.9	97.5	95.4	99.8	99.7	98.2	99.8	94.8	99.8	99.2	91.4	98.8	0.0	33.5
4	99.3	99.1	99.8	99.2	97.8	96.2	99.9	99.8	99.1	99.8	96.1	99.8	99.6	87.7	99.1	0.0	44.5
6	99.4	98.5	99.9	99.3	98.9	95.5	100.0	99.8	98.3	100.0	96.9	99.8	99.6	85.3	99.8	0.0	47.5
8	99.4	98.1	99.7	98.6	97.8	96.2	99.8	99.9	99.2	99.8	97.4	99.7	99.4	86.2	99.1	0.0	49.1
10	99.6	98.5	99.7	99.2	98.5	96.9	100.0	99.6	98.8	100.0	97.2	99.8	99.4	87.6	99.1	92.8	52.6
12	99.3	98.4	99.5	99.1	97.9	96.1	99.6	99.3	98.6	99.6	96.9	99.7	99.5	90.5	99.5	93.9	53.8
14	99.4	98.5	99.8	99.5	98.7	96.7	99.8	99.7	98.5	99.8	97.0	99.9	99.6	88.8	99.2	93.6	50.8
16	99.5	97.9	99.1	98.9	98.2	97.9	99.8	99.8	99.1	99.7	96.9	99.7	99.7	85.6	99.0	92.7	54.6
18	99.3	98.4	100.0	99.5	98.9	97.2	100.0	99.7	99.3	99.7	97.4	99.8	99.5	86.1	99.4	95.5	54.9
20	99.6	98.2	99.6	98.8	98.6	97.8	99.7	99.6	98.9	99.7	97.2	99.7	99.6	88.4	99.3	95.6	57.9
22	99.6	98.5	99.8	99.5	99.0	97.6	99.9	99.8	99.3	99.9	98.0	99.9	99.8	91.0	99.4	94.0	56.3
24	99.8	98.4	99.9	99.3	98.9	98.0	99.9	99.9	98.9	99.8	97.9	99.7	99.9	97.9	99.3	95.0	55.1
26	99.4	98.3	99.9	99.4	98.6	97.3	99.9	99.8	99.3	99.8	97.7	99.9	99.6	97.2	99.3	94.2	54.8
28	99.6	98.1	99.8	99.8	98.8	97.3	99.9	99.8	99.2	99.7	96.6	99.8	99.7	97.8	99.1	94.8	56.6
30	99.6	98.8	99.9	99.7	98.7	98.2	99.9	99.8	99.2	99.9	97.2	99.8	99.8	97.7	99.6	95.8	55.5
32	99.6	98.5	100.0	99.9	98.2	97.9	100.0	100.0	99.1	99.9	97.8	99.8	99.7	97.9	99.5	95.3	80.8
34	99.9	98.4	99.9	99.9	98.5	97.2	99.9	99.8	99.6	99.6	97.7	99.8	99.7	98.7	99.2	97.0	74.6
36	99.8	98.1	99.9	99.8	99.2	97.2	99.8	100.0	99.3	99.9	96.8	99.9	99.9	98.1	99.4	94.9	75.9
38	99.8	98.2	99.9	99.8	98.6	96.6	99.8	99.9	99.4	99.8	97.3	99.9	99.8	98.1	99.7	95.6	72.5
40	99.6	97.6	99.9	99.6	98.4	96.6	99.7	100.0	99.1	99.6	97.0	99.6	99.6	97.4	99.5	94.6	73.2
42	99.5	97.9	99.9	99.6	98.9	96.6	100.0	100.0	99.2	99.7	96.7	99.9	99.9	97.7	99.6	96.1	75.3
44	99.6	98.2	99.9	99.7	98.4	95.4	100.0	99.9	99.2	99.7	96.0	99.9	99.8	98.3	99.6	96.0	73.8
46	99.6	98.1	99.7	99.6	98.2	95.0	99.7	99.8	99.3	99.6	98.4	99.6	99.6	98.3	99.3	95.7	73.4
48	99.9	98.5	99.8	99.8	98.9	94.0	100.0	100.0	99.5	99.8	98.7	99.9	99.8	97.4	99.5	96.4	74.8
50	99.6	98.4	99.8	99.7	98.6	93.8	99.8	99.8	99.1	99.7	98.5	99.8	99.7	97.4	99.2	95.6	72.9
52	99.5	97.8	99.6	99.5	98.5	94.0	99.7	99.7	99.2	99.4	98.4	99.7	99.6	96.8	99.0	95.1	56.7
54	99.5	97.9	99.7	99.7	98.4	94.5	99.8	99.9	99.1	99.7	98.3	99.8	99.8	96.9	99.0	94.9	56.1
56	99.5	97.8	99.9	99.8	98.3	94.0	99.8	99.9	99.4	99.6	98.0	99.8	99.7	97.5	99.5	94.2	57.0
58	99.8	97.2	99.8	99.8	98.7	95.5	99.9	99.9	99.5	99.8	98.9	99.9	99.8	97.1	99.4	94.0	55.9
60	99.6	97.3	99.7	99.6	98.4	96.3	99.9	99.8	99.3	99.7	98.8	99.8	99.8	97.2	99.5	94.5	57.9
62	99.6	97.1	99.8	99.8	98.5	96.5	99.9	99.9	99.4	99.6	99.1	99.9	99.8	97.3	99.5	93.1	56.7
64	99.5	97.2	99.8	99.7	98.6	96.8	99.9	99.8	99.1	99.6	98.9	99.8	99.7	97.1	99.4	93.3	58.2
66	99.7	97.4	99.8	99.8	98.9	97.5	99.9	99.9	99.1	99.6	99.2	99.8	99.8	97.5	99.4	93.3	57.7
68	99.5	97.0	99.8	99.7	98.5	96.8	99.9	99.9	99.2	99.6	99.1	99.9	99.8	97.4	99.5	92.7	58.4
70	99.5	96.6	99.8	99.8	98.7	97.0	99.8	99.8	99.3	99.6	99.3	99.8	99.7	97.0	99.3	92.4	58.6
72	99.6	96.8	99.7	99.6	98.5	97.2	99.7	99.8	99.2	99.4	99.4	99.8	99.8	96.5	99.4	92.0	58.1
74	99.7	96.5	99.8	99.8	98.3	97.4	99.8	99.9	99.1	99.6	99.4	99.8	99.8	96.8	99.6	92.1	57.8
76	99.7	96.2	99.8	99.7	98.8	97.1	99.7	99.9	98.9	99.4	99.7	99.9	99.8	96.7	99.3	90.8	59.4
78	99.6	96.0	99.8	99.8	98.4	97.0	99.7	99.9	99.0	99.6	99.5	99.8	99.8	97.5	99.4	89.5	60.0
80	99.5	95.9	99.6	99.6	98.1	97.4	99.7	99.7	99.0	99.5	99.6	99.8	99.6	96.5	99.4	89.1	58.9
82	99.6	95.3	99.5	99.8	98.4	97.0	99.5	99.6	99.1	99.4	99.6	99.8	99.4	96.4	99.4	88.1	58.7
84	99.6	95.5	99.7	99.7	98.3	96.9	99.4	99.5	98.9	99.4	99.7	99.8	99.3	95.6	99.4	87.6	58.3
86	99.4	95.1	99.8	99.8	98.0	96.5	99.4	99.7	99.0	99.4	99.7	99.9	99.5	95.7	99.6	85.3	58.6
88	99.6	94.3	99.7	99.7	97.8	96.4	99.3	99.5	98.9	99.4	99.6	99.9	99.4	96.2	99.4	84.2	57.9
90	99.6	94.8	99.7	99.7	98.0	96.4	99.4	99.6	99.0	99.3	99.7	99.9	99.5	96.2	99.4	84.2	58.1
92	99.7	94.1	99.8	99.8	98.0	96.3	99.3	99.5	98.8	99.4	99.8	99.8	99.4	95.3	99.4	82.4	58.2
94	99.6	94.2	99.7	99.7	97.9	95.7	99.3	99.4	99.0	99.5	99.7	99.8	99.3	95.0	99.5	0.0	58.0
96	99.6	93.8	99.8	99.7	98.0	95.8	99.5	99.5	98.9	99.5	99.5	99.8	99.4	95.1	99.5	0.0	57.7
98	99.5	93.7	99.7	99.5	97.4	95.8	99.6	99.2	98.8	99.5	99.1	99.9	99.4	94.8	99.5	0.0	56.6
100	99.5	95.4	99.6	99.6	97.5	96.4	99.6	99.2	98.7	99.6	98.0	99.7	99.4	89.3	99.4	0.0	49.9

4.7 I2-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	99.9	99.4	99.6	98.7	98.3	98.5	99.8	99.8	99.4	99.9	96.6	99.9	99.7	91.5	99.4	0.0	39.7
4	99.8	98.9	99.8	99.7	98.3	97.9	100.0	99.8	99.6	99.7	97.7	99.8	99.7	86.8	99.6	0.0	55.3
6	99.7	98.4	99.6	99.7	99.0	98.4	99.5	99.5	99.3	99.6	96.8	99.6	99.3	84.4	99.5	0.0	63.8
8	99.8	98.4	99.9	99.9	98.4	98.0	99.9	99.9	99.5	99.9	98.1	99.9	99.8	87.2	99.7	0.0	62.8
10	99.9	98.4	99.9	99.9	98.4	98.3	99.7	99.7	99.6	99.9	97.8	100.0	99.6	87.1	99.7	95.2	63.0
12	99.8	98.5	99.9	100.0	99.2	98.2	99.9	99.8	99.8	99.9	97.3	100.0	99.9	90.7	99.8	94.8	64.3
14	99.8	98.7	99.6	99.9	98.7	97.9	99.9	99.8	99.8	99.8	97.7	99.8	99.8	88.9	99.7	94.8	69.2
16	99.6	98.1	99.7	99.9	98.4	98.0	99.8	99.5	99.6	99.7	97.3	99.7	99.4	86.5	99.6	95.1	68.5
18	99.7	98.3	99.8	99.9	99.0	98.2	99.8	99.8	99.8	99.8	97.7	99.8	99.8	87.2	99.7	94.6	68.9
20	99.9	98.2	99.6	99.9	99.0	98.2	99.9	99.7	99.5	99.8	97.8	99.8	99.5	88.1	99.8	95.8	72.2
22	99.9	97.8	99.7	99.9	99.1	98.1	99.8	99.9	99.4	99.8	97.8	99.7	99.8	91.2	99.5	94.4	71.0
24	99.9	98.2	99.9	100.0	98.9	97.3	100.0	100.0	99.5	99.8	97.8	99.8	99.9	98.4	99.6	94.9	70.4
26	99.9	97.7	99.5	99.8	98.5	97.0	99.9	100.0	99.5	99.7	96.9	99.6	99.8	98.6	99.5	94.4	71.6
28	99.7	97.9	99.6	99.7	98.9	97.2	99.8	99.8	99.6	99.6	97.6	99.7	99.7	98.5	99.5	95.6	71.3
30	99.7	98.3	99.9	99.9	99.0	97.1	99.9	99.9	99.2	99.8	97.5	100.0	99.8	97.8	99.5	95.7	72.7
32	99.8	97.7	99.8	99.8	98.8	96.5	99.9	99.9	99.4	99.8	97.3	99.8	99.7	98.1	99.4	94.9	89.7
34	99.8	98.2	99.9	99.9	98.8	96.3	99.9	100.0	99.7	99.9	96.7	99.9	99.9	99.1	99.8	96.2	84.6
36	99.8	98.1	99.9	99.9	99.0	95.7	99.9	99.9	99.4	99.8	96.6	99.8	99.9	98.6	99.4	95.4	84.7
38	100.0	98.0	99.9	99.9	98.8	95.3	100.0	100.0	99.7	99.9	96.2	99.9	99.9	98.6	99.7	95.1	84.0
40	99.7	98.4	99.8	99.9	99.2	94.6	99.9	100.0	99.5	99.9	96.5	99.9	99.8	98.1	99.6	96.0	84.9
42	99.8	98.3	99.8	99.8	98.9	92.3	99.9	99.9	99.5	99.7	96.1	99.8	99.7	98.1	99.6	96.4	86.4
44	99.8	97.9	99.8	99.8	98.7	92.8	99.9	99.9	99.5	99.8	95.9	99.8	99.8	98.3	99.5	96.7	85.2
46	99.8	97.8	99.8	99.8	98.9	90.3	99.9	99.9	99.6	99.7	95.9	99.8	99.8	98.4	99.6	96.5	85.3
48	99.8	98.2	99.8	99.8	98.8	89.0	99.8	99.8	99.5	99.7	98.5	99.8	99.8	97.9	99.5	96.5	86.3
50	99.9	98.6	99.8	99.8	98.8	89.4	99.9	99.9	99.6	99.7	98.3	99.7	99.8	98.0	99.6	97.0	84.2
52	99.8	98.4	99.8	99.8	98.7	89.8	99.9	99.8	99.6	99.8	98.5	99.8	99.8	97.5	99.5	96.1	72.6
54	99.8	97.9	99.8	99.8	98.8	90.2	99.9	99.9	99.6	99.8	98.4	99.8	99.8	97.5	99.6	95.5	73.5
56	99.7	97.0	99.7	99.8	98.8	91.0	99.8	99.9	99.5	99.6	98.4	99.8	99.7	98.3	99.6	94.0	73.4
58	99.9	97.6	99.9	99.9	99.0	92.2	99.9	99.9	99.6	99.9	98.4	99.9	99.9	98.4	99.7	95.2	73.2
60	99.7	97.4	99.9	99.8	99.0	93.0	99.8	99.8	99.6	99.8	98.6	99.8	99.8	97.6	99.7	94.9	72.8
62	99.9	97.2	99.9	99.9	99.0	94.6	99.9	99.8	99.4	99.8	98.5	99.8	99.7	97.2	99.6	93.3	73.7
64	99.8	97.1	99.7	99.9	99.0	95.4	99.9	99.8	99.5	99.7	98.5	99.9	99.8	97.7	99.6	93.5	74.9
66	99.9	97.1	99.8	99.9	98.8	96.1	99.9	99.9	99.5	99.8	98.7	99.9	99.8	97.8	99.6	92.9	76.7
68	99.8	96.8	99.9	99.9	98.7	96.6	99.9	99.9	99.5	99.5	98.9	99.9	99.9	97.8	99.6	92.4	75.7
70	99.9	96.7	99.8	99.9	98.7	96.9	99.9	99.9	99.6	99.6	99.1	100.0	99.9	97.6	99.6	92.3	76.3
72	99.8	96.6	99.8	99.9	99.0	97.2	99.9	99.9	99.6	99.5	99.2	99.9	99.8	97.2	99.6	91.8	75.7
74	99.8	96.6	99.8	99.9	98.9	97.2	99.8	99.9	99.6	99.5	99.2	99.8	99.8	97.2	99.6	91.4	75.4
76	99.8	96.6	99.7	99.9	98.8	97.2	99.9	100.0	99.7	99.6	99.4	100.0	100.0	97.6	99.7	90.5	77.0
78	99.7	96.1	99.7	99.9	98.8	97.3	99.8	99.8	99.6	99.3	99.4	99.9	99.8	97.7	99.6	88.9	75.1
80	99.8	96.0	99.7	99.8	98.8	97.4	99.7	99.8	99.6	99.3	99.5	99.8	99.8	97.0	99.6	88.1	75.3
82	99.8	95.2	99.8	99.8	98.8	97.3	99.7	99.7	99.5	99.3	99.5	99.8	99.6	96.6	99.6	86.6	76.1
84	99.9	95.2	99.8	99.9	98.8	97.4	99.7	99.6	99.5	99.2	99.6	99.9	99.6	96.4	99.6	86.5	75.7
86	99.8	95.5	99.8	99.9	98.3	97.2	99.6	99.7	99.5	99.4	99.6	99.9	99.7	96.6	99.5	85.5	75.8
88	99.8	95.2	99.8	99.8	98.4	97.3	99.5	99.6	99.5	99.4	99.6	99.9	99.6	96.8	99.6	84.9	75.9
90	99.8	95.0	99.8	99.9	98.4	97.5	99.6	99.5	99.5	99.4	99.6	99.8	99.5	96.7	99.6	84.4	75.1
92	99.8	93.9	99.8	99.9	98.5	97.3	99.6	99.6	99.5	99.4	99.6	99.9	99.6	96.1	99.5	82.1	76.1
94	99.8	93.7	99.8	99.9	98.3	97.4	99.5	99.5	99.4	99.4	99.6	99.9	99.6	96.0	99.6	0.0	75.9
96	99.8	93.4	99.8	99.9	98.4	97.0	99.6	99.5	99.6	99.5	99.6	99.9	99.7	96.2	99.6	0.0	75.7
98	99.8	93.8	99.8	99.8	98.2	97.3	99.7	99.3	99.5	99.5	99.6	99.9	99.7	95.8	99.7	0.0	74.5
100	99.8	95.8	99.7	99.8	98.2	97.9	99.8	99.1	99.6	99.6	99.2	99.8	99.6	92.1	99.7	0.0	58.4

4.8 I2-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	99.7	99.2	99.8	98.1	98.9	98.2	99.7	99.7	99.5	99.7	94.5	99.7	99.6	91.8	99.5	0.0	43.1
4	99.8	99.1	99.7	99.5	99.0	98.7	99.8	99.9	99.4	99.9	97.0	99.8	99.9	88.8	99.6	0.0	60.8
6	99.7	98.3	99.7	99.8	98.2	98.0	99.8	99.6	99.3	99.4	96.9	99.7	99.6	84.6	99.5	0.0	69.5
8	99.8	98.7	99.7	99.8	98.3	98.5	99.9	99.7	99.5	99.7	97.1	99.6	99.7	86.5	99.6	0.0	71.2
10	99.9	99.1	99.7	100.0	98.4	98.0	99.9	99.8	99.5	99.8	97.6	99.8	99.9	86.7	99.8	95.5	72.9
12	99.9	98.3	99.9	99.9	99.0	97.2	99.9	99.9	99.5	99.6	97.1	99.9	99.8	91.2	99.6	94.3	74.4
14	99.8	98.6	99.7	99.8	98.6	98.2	99.7	99.8	99.5	99.7	96.9	99.7	99.7	89.1	99.6	94.9	76.3
16	99.9	98.6	99.5	100.0	98.1	98.2	99.9	99.9	99.7	99.9	97.8	99.8	99.8	88.6	99.8	94.9	78.6
18	99.8	98.1	99.6	99.9	99.0	97.8	99.8	99.7	99.3	99.8	97.6	99.8	99.5	87.0	99.4	93.9	76.9
20	99.7	98.1	99.4	99.9	98.8	97.3	99.6	99.6	99.5	99.8	97.6	99.7	99.5	87.7	99.6	94.1	81.6
22	99.9	98.3	99.6	100.0	99.0	97.5	99.8	99.9	99.5	99.8	97.3	99.7	99.8	90.6	99.7	94.5	77.6
24	99.9	98.3	99.7	99.9	99.0	97.0	99.9	99.9	99.5	99.9	97.4	99.8	99.8	98.4	99.6	95.5	79.2
26	99.8	98.1	99.7	99.9	98.9	96.7	99.8	99.8	99.5	99.8	97.4	99.7	99.8	98.5	99.7	94.5	81.0
28	99.8	98.3	99.8	99.9	99.1	96.3	99.9	99.9	99.7	99.8	97.7	99.9	99.9	98.3	99.6	95.4	81.0
30	99.6	98.4	99.7	99.7	99.1	95.6	99.8	99.8	99.4	99.5	97.4	99.6	99.6	98.4	99.6	95.4	80.0
32	99.8	98.3	100.0	99.9	98.7	94.7	99.9	99.9	99.6	99.9	97.7	99.9	99.7	98.1	99.6	95.4	93.2
34	99.8	98.7	100.0	99.8	98.8	93.5	99.9	99.9	99.7	99.8	98.1	99.9	99.9	99.0	99.6	96.2	88.6
36	99.8	98.4	99.8	99.8	99.0	92.0	99.8	99.9	99.6	99.8	96.9	99.8	99.8	98.8	99.7	95.6	88.7
38	99.9	98.4	100.0	99.9	99.0	90.3	99.9	99.9	99.6	99.8	97.0	99.9	99.8	98.3	99.7	95.6	87.8
40	99.9	98.7	99.8	99.9	99.2	88.5	99.9	99.9	99.5	99.9	97.2	99.8	99.9	98.4	99.6	96.5	89.3
42	99.8	98.3	99.9	99.8	99.0	85.2	99.9	99.9	99.6	99.8	96.5	99.9	99.8	98.6	99.7	96.0	89.5
44	99.9	98.4	99.8	100.0	98.8	83.9	100.0	100.0	99.6	99.9	96.2	100.0	99.9	98.4	99.7	96.8	89.2
46	99.8	98.3	99.6	99.8	99.0	84.0	99.8	99.9	99.5	99.7	98.2	99.8	99.8	98.5	99.6	96.6	90.1
48	99.8	98.6	99.9	99.8	99.1	85.2	99.9	99.9	99.5	99.8	98.5	99.9	99.8	98.4	99.6	96.8	89.6
50	99.9	98.8	99.7	99.9	98.8	83.4	99.9	99.9	99.5	99.8	98.7	99.9	99.8	98.2	99.6	96.8	88.2
52	99.9	98.3	99.8	100.0	99.0	84.2	99.9	99.9	99.7	99.7	98.9	99.9	99.8	98.0	99.8	95.7	82.7
54	99.9	98.0	99.9	99.9	98.9	83.9	100.0	99.9	99.7	99.7	98.9	99.8	99.7	98.2	99.7	95.5	82.6
56	99.9	97.4	99.8	99.8	99.0	83.6	99.9	99.9	99.5	99.6	98.6	99.9	99.7	98.5	99.4	95.1	84.0
58	99.8	97.5	99.8	99.8	98.9	84.9	99.9	99.9	99.5	99.7	98.8	99.8	99.8	98.2	99.7	95.1	83.2
60	99.8	97.5	99.8	99.9	99.1	87.0	99.9	99.9	99.6	99.7	98.8	99.8	99.7	97.7	99.6	94.4	84.0
62	99.8	97.3	99.7	99.8	99.0	88.7	99.9	99.9	99.5	99.7	99.0	99.8	99.8	98.1	99.5	93.9	84.1
64	99.8	97.4	99.9	99.9	98.9	91.2	99.9	99.9	99.5	99.7	98.9	99.9	99.8	98.1	99.6	93.9	83.8
66	99.8	97.0	99.8	99.9	98.9	93.0	99.9	99.8	99.5	99.7	99.0	99.9	99.8	98.2	99.5	93.1	84.3
68	99.8	96.8	99.8	99.8	98.9	94.3	99.9	99.9	99.5	99.4	99.2	99.8	99.8	98.2	99.6	92.9	85.0
70	99.8	97.1	99.8	99.8	98.9	95.1	99.8	99.8	99.6	99.5	99.2	99.9	99.8	98.1	99.6	93.0	84.8
72	99.8	96.8	99.8	99.8	98.8	96.0	99.9	99.9	99.5	99.5	99.2	99.8	99.7	97.6	99.6	91.2	85.5
74	99.9	96.9	99.9	99.9	99.0	96.5	99.9	99.9	99.7	99.5	99.5	99.9	99.8	97.7	99.6	91.4	85.6
76	99.8	96.6	99.8	99.9	98.9	96.8	99.9	99.9	99.5	99.4	99.6	99.8	99.8	97.7	99.5	90.3	86.1
78	99.8	96.2	99.8	99.9	99.0	97.2	99.9	99.8	99.6	99.4	99.6	99.9	99.8	98.1	99.6	89.8	85.0
80	99.8	96.1	99.8	99.9	98.8	97.4	99.9	99.8	99.6	99.5	99.7	99.9	99.8	97.8	99.6	88.5	85.7
82	99.8	95.5	99.9	99.9	98.9	97.3	99.8	99.7	99.6	99.3	99.6	99.9	99.6	97.4	99.6	86.9	85.5
84	99.8	95.7	99.8	99.9	98.7	97.3	99.8	99.7	99.6	99.4	99.7	99.9	99.7	97.1	99.7	86.4	85.5
86	99.7	95.2	99.8	99.8	98.4	97.5	99.7	99.7	99.5	99.4	99.7	99.8	99.6	97.1	99.6	85.6	85.3
88	99.9	94.8	99.9	99.9	98.4	97.3	99.8	99.7	99.7	99.4	99.8	99.9	99.7	97.1	99.7	84.8	86.0
90	99.8	94.8	99.8	99.9	98.6	97.3	99.7	99.6	99.5	99.4	99.7	99.9	99.6	97.4	99.6	84.2	85.4
92	99.8	94.2	99.9	99.9	98.6	97.1	99.7	99.6	99.6	99.4	99.7	99.9	99.7	96.8	99.7	82.6	86.1
94	99.9	94.0	99.9	99.8	98.7	97.3	99.7	99.5	99.5	99.4	99.6	99.9	99.6	96.5	99.6	0.0	86.0
96	99.8	93.7	99.9	99.9	98.4	97.4	99.7	99.5	99.6	99.5	99.6	99.9	99.7	96.4	99.6	0.0	86.2
98	99.8	93.9	99.9	99.8	98.3	97.6	99.7	99.5	99.6	99.6	99.2	99.8	99.7	96.4	99.7	0.0	84.8
100	99.8	95.8	99.8	99.8	98.3	97.8	99.8	99.2	99.6	99.7	98.3	99.9	99.7	92.9	99.7	0.0	59.6

4.9 I3-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	88.0	88.2	94.4	92.7	71.5	56.5	96.9	93.4	N/A	95.1	87.3	95.3	88.2	71.1	91.0	0.0	25.4
4	89.9	92.2	95.1	94.1	72.4	58.9	97.1	93.1	N/A	95.1	89.7	94.9	87.4	69.6	92.2	0.0	31.1
6	91.3	93.1	94.6	95.0	71.7	61.3	97.0	93.2	N/A	94.8	90.6	95.1	87.3	67.9	92.5	0.0	35.5
8	91.1	92.4	94.0	94.4	72.5	62.8	96.6	93.0	N/A	94.5	89.7	94.8	87.4	66.8	90.4	0.0	37.7
10	91.4	92.8	95.3	94.2	71.6	64.7	97.2	93.4	N/A	95.4	91.1	94.1	87.1	69.5	91.1	86.9	37.2
12	92.4	92.8	95.2	94.9	73.1	70.4	97.5	94.0	N/A	95.3	91.6	94.9	87.7	71.2	91.2	87.8	37.8
14	92.9	92.9	94.3	92.5	73.5	70.1	96.9	92.9	N/A	95.3	91.4	94.5	87.9	84.5	91.1	86.9	39.1
16	93.6	93.2	95.3	93.8	73.7	74.6	97.3	94.0	N/A	95.8	92.2	94.6	89.0	82.5	91.4	88.6	39.4
18	93.2	91.5	94.1	93.5	74.6	73.8	97.9	92.9	N/A	95.6	91.7	93.5	86.9	80.7	90.1	88.5	39.1
20	92.3	91.6	93.9	93.8	75.6	75.0	98.0	93.0	N/A	95.5	91.8	93.8	87.1	81.8	90.0	89.6	40.1
22	93.7	91.5	94.7	94.3	75.7	77.3	98.4	95.5	N/A	95.8	91.8	94.0	91.9	81.9	90.4	89.5	40.5
24	93.0	91.7	94.3	94.8	75.6	79.5	98.5	96.7	N/A	95.2	91.6	93.9	91.9	86.2	90.1	89.5	40.4
26	93.5	91.5	97.1	94.9	76.3	80.4	98.5	96.7	N/A	95.5	92.0	93.7	92.5	92.5	89.7	89.4	40.5
28	94.0	91.7	97.0	95.2	76.2	81.6	98.2	97.0	N/A	93.8	91.5	95.8	92.3	91.8	92.3	89.8	40.4
30	93.9	91.7	96.5	95.6	76.5	82.1	98.4	97.1	N/A	94.1	91.7	95.2	92.5	91.7	92.6	90.8	41.1
32	93.9	91.7	96.9	96.0	75.3	82.5	98.4	97.2	N/A	93.8	92.7	95.8	93.0	91.3	92.8	90.6	63.0
34	93.9	91.4	96.4	95.5	76.7	83.4	98.3	96.8	N/A	94.1	92.3	95.6	93.2	91.2	92.3	90.5	58.6
36	93.2	91.2	96.7	95.8	75.9	83.5	98.2	96.8	N/A	94.1	92.3	95.4	92.2	91.0	91.9	90.2	59.3
38	93.7	91.0	96.5	95.7	76.8	83.0	98.3	97.2	N/A	94.4	91.8	95.5	92.9	92.5	92.3	90.6	58.9
40	93.5	91.0	96.4	95.7	75.8	83.4	98.4	97.0	N/A	94.0	92.0	95.5	92.4	91.3	92.6	90.5	58.4
42	93.4	91.2	96.7	96.2	75.1	84.2	98.6	97.2	N/A	94.2	92.0	95.9	92.8	91.2	92.6	90.8	59.4
44	93.9	91.4	96.0	95.8	75.9	84.1	98.1	97.2	N/A	93.8	90.9	95.7	93.4	91.5	92.8	91.5	59.2
46	94.0	91.7	96.5	95.5	76.5	83.9	98.5	97.2	N/A	94.5	92.0	95.4	93.1	90.5	92.6	91.7	58.5
48	93.4	91.8	96.0	93.4	75.6	83.7	98.4	97.1	N/A	94.4	95.1	95.6	93.1	89.8	92.6	91.2	57.1
50	94.0	92.0	96.0	93.6	76.5	85.3	98.7	97.5	N/A	94.5	95.7	95.9	93.6	92.2	92.8	91.7	58.1
52	93.9	90.9	96.2	93.2	75.7	84.6	98.4	97.3	N/A	94.7	95.8	95.5	93.0	90.8	92.6	91.1	40.2
54	93.8	90.2	96.6	93.3	76.3	83.8	98.2	97.1	N/A	94.4	95.8	95.6	92.9	89.7	92.8	90.0	41.5
56	93.7	90.6	96.4	92.9	75.6	82.9	98.1	96.8	N/A	93.6	95.3	95.7	92.8	89.6	92.3	89.3	41.7
58	94.4	91.0	96.7	93.3	76.5	83.7	98.3	97.4	N/A	94.3	95.9	95.8	93.0	89.6	92.5	89.8	42.4
60	93.7	90.2	96.8	93.4	75.9	84.2	98.2	97.0	N/A	94.5	96.3	95.6	93.2	89.0	93.0	89.5	41.6
62	93.8	90.7	97.1	93.4	76.0	84.6	98.5	97.3	N/A	94.8	96.6	96.0	93.4	90.5	93.4	89.3	41.8
64	94.1	90.8	96.9	93.2	75.7	84.7	98.3	96.9	N/A	94.3	96.5	95.5	93.1	89.5	92.7	88.7	42.3
66	94.1	90.5	96.9	93.3	75.2	84.7	98.2	96.9	N/A	94.1	96.5	95.9	93.0	89.4	93.1	88.6	41.1
68	93.8	90.4	97.2	93.3	76.6	84.6	98.3	96.7	N/A	94.7	96.6	95.6	92.5	89.3	92.8	88.0	40.9
70	94.0	90.1	96.6	93.2	76.1	84.2	98.2	96.7	N/A	93.9	96.7	95.7	92.6	89.2	92.6	87.7	41.7
72	93.9	90.3	97.2	93.5	75.9	84.6	98.1	97.1	N/A	94.2	97.2	96.2	92.9	88.5	93.1	87.0	41.9
74	93.8	90.2	96.9	93.5	74.6	84.0	97.9	96.7	N/A	95.3	97.1	95.8	92.7	89.4	92.9	86.4	42.0
76	93.9	90.0	96.9	93.4	75.3	82.9	97.9	96.5	N/A	95.5	97.1	95.9	92.1	88.1	91.3	85.1	42.6
78	93.4	89.5	95.7	93.3	74.2	82.4	97.9	96.5	N/A	95.6	97.3	95.8	91.8	87.2	91.2	84.3	41.8
80	93.3	89.7	95.9	93.4	74.4	81.9	97.6	95.5	N/A	95.3	97.4	95.9	90.2	87.4	91.0	83.7	42.6
82	93.5	88.9	95.5	93.0	74.1	80.2	97.3	93.7	N/A	95.1	97.6	95.7	87.0	86.7	91.0	81.5	42.2
84	93.3	89.0	95.6	92.8	72.5	79.6	97.1	93.8	N/A	95.2	97.4	95.8	87.1	86.9	91.1	80.7	42.1
86	93.5	89.5	95.7	93.0	72.3	78.1	96.1	93.9	N/A	95.0	97.2	95.9	87.2	86.9	91.4	79.7	42.3
88	93.6	88.9	95.7	92.9	71.8	77.1	96.1	93.9	N/A	95.0	97.2	96.0	86.8	85.9	91.3	78.3	41.8
90	93.4	89.3	95.6	92.6	72.4	75.9	96.1	93.6	N/A	95.0	96.8	95.9	87.0	86.1	91.5	78.4	40.7
92	93.3	88.7	95.8	92.5	72.4	73.7	96.2	93.3	N/A	95.0	96.8	95.8	86.9	85.2	91.5	76.2	41.8
94	93.4	88.1	95.5	92.3	72.1	71.6	96.1	93.4	N/A	94.6	96.3	95.9	86.9	85.0	91.4	0.0	41.6
96	93.4	87.8	95.6	92.5	72.0	70.7	96.5	93.2	N/A	94.7	96.0	95.8	87.0	85.6	91.7	0.0	41.0
98	93.6	86.2	95.5	92.0	71.3	69.6	97.0	93.5	N/A	94.6	95.4	96.0	87.5	78.1	91.9	0.0	40.5
100	93.5	83.7	94.8	91.6	72.0	67.2	97.2	91.7	N/A	94.7	93.9	95.7	87.5	72.5	91.7	0.0	36.5

4.10 I3-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	98.0	96.2	97.1	93.9	N/A	82.6	97.3	95.7	94.2	96.7	89.2	97.7	94.3	72.5	95.3	0.0	35.1
4	98.2	96.6	97.7	96.0	N/A	82.7	97.9	96.7	95.0	96.9	91.5	98.2	95.5	70.5	96.2	0.0	45.9
6	98.0	96.5	97.7	96.3	N/A	85.4	97.8	96.6	94.9	96.8	92.1	97.7	95.1	68.7	96.6	0.0	52.3
8	98.1	96.3	97.5	96.4	N/A	85.5	97.6	96.4	95.0	96.7	91.7	97.8	94.8	67.9	95.8	0.0	55.2
10	98.0	96.9	98.0	96.9	N/A	85.8	97.9	96.8	95.4	97.5	92.9	97.9	95.5	70.5	96.5	92.5	56.6
12	98.1	96.4	98.0	96.6	N/A	86.5	97.6	97.0	95.6	97.0	93.4	97.7	95.1	71.9	96.2	92.3	57.2
14	98.7	96.8	97.8	96.9	N/A	88.7	98.0	97.0	96.3	97.3	93.5	97.7	95.6	86.7	96.7	93.1	58.2
16	98.6	96.6	97.9	96.8	N/A	87.7	97.8	97.2	95.8	97.5	93.5	97.6	95.4	83.6	96.5	92.6	58.7
18	98.5	95.8	97.7	96.9	N/A	88.1	98.0	96.9	95.5	97.2	93.3	97.1	94.9	83.2	95.4	92.1	58.2
20	98.4	95.8	97.3	96.6	N/A	87.2	98.5	96.6	95.6	97.1	93.6	96.8	95.1	84.2	95.7	92.8	60.3
22	98.2	95.3	97.4	96.8	N/A	87.6	98.6	97.3	95.4	97.2	93.5	96.7	96.4	83.7	95.8	92.0	60.3
24	98.7	95.9	97.9	97.2	N/A	88.2	98.8	98.8	95.7	97.3	93.8	96.9	97.1	88.0	96.2	92.8	59.5
26	98.5	95.6	97.7	97.1	N/A	88.1	98.8	98.6	95.7	97.2	94.2	96.9	97.1	95.1	95.9	92.9	61.8
28	98.4	95.0	97.5	96.9	N/A	87.1	98.7	98.6	95.5	95.9	93.6	96.5	96.9	94.5	95.4	92.6	61.1
30	98.5	95.1	97.5	97.2	N/A	86.5	99.0	98.6	96.1	96.1	93.9	96.4	97.1	94.8	95.5	92.8	61.2
32	98.5	95.5	98.9	98.0	N/A	86.6	99.0	98.8	96.3	96.4	94.7	96.2	97.2	94.5	95.7	92.9	82.1
34	98.7	95.7	98.7	98.0	N/A	85.9	99.1	98.8	96.6	96.5	94.9	95.7	97.3	94.6	95.7	93.0	76.9
36	98.5	95.8	98.7	98.0	N/A	85.0	98.8	98.7	96.7	96.5	94.5	98.0	97.1	93.4	95.3	92.6	78.1
38	98.6	95.6	98.7	97.8	N/A	84.7	99.1	98.8	96.6	96.4	93.9	98.3	97.4	95.5	95.1	94.5	77.5
40	98.6	95.6	98.7	98.0	N/A	84.9	98.9	98.7	96.4	96.2	94.0	98.0	97.0	94.5	94.9	94.9	76.8
42	98.5	95.6	98.4	97.7	N/A	84.1	98.9	99.0	96.5	96.3	94.0	98.1	97.0	94.2	96.4	95.0	77.1
44	98.6	95.4	98.4	97.7	N/A	84.8	98.9	98.7	96.6	96.3	93.1	98.0	97.2	94.2	96.5	94.9	77.9
46	98.5	95.7	98.4	97.7	N/A	85.1	99.1	98.7	96.6	96.6	93.6	98.1	97.3	94.0	96.8	95.5	77.8
48	98.8	96.0	98.4	97.7	N/A	85.1	99.1	98.9	96.8	96.5	96.7	98.1	97.2	93.3	96.5	95.3	77.6
50	98.6	96.2	98.2	97.8	N/A	85.2	99.1	98.9	96.7	96.5	96.7	98.0	97.4	94.8	96.5	95.1	76.2
52	98.5	95.3	98.3	97.6	N/A	84.9	98.9	98.8	96.4	96.3	96.8	97.8	97.1	94.0	96.4	94.4	60.9
54	98.5	95.2	98.7	97.7	N/A	84.6	98.8	98.6	96.5	96.3	96.7	98.0	96.9	93.7	96.5	94.1	61.6
56	98.6	94.8	98.6	97.8	N/A	84.3	99.0	98.9	96.5	96.3	96.9	98.0	97.2	93.6	96.5	93.8	62.8
58	98.6	95.0	98.7	97.7	N/A	85.0	99.1	98.8	96.8	96.5	96.9	98.0	97.3	93.6	96.5	93.3	62.3
60	98.3	94.7	98.5	97.8	N/A	84.5	98.9	98.7	96.4	96.3	97.2	98.0	97.1	92.5	96.3	92.5	62.6
62	98.5	94.8	98.8	97.9	N/A	84.9	99.1	98.7	96.6	96.7	97.4	98.1	97.2	94.0	95.9	92.5	62.7
64	98.7	94.4	98.7	97.8	N/A	84.8	99.0	98.8	96.3	96.2	97.4	98.0	97.1	93.9	95.9	91.8	63.4
66	98.5	94.6	98.7	97.8	N/A	85.6	99.0	98.6	96.1	96.5	97.6	98.2	97.2	93.6	96.0	90.9	63.8
68	98.6	94.6	98.9	97.9	N/A	86.6	99.0	98.8	96.3	96.5	97.7	98.1	97.3	93.5	96.2	90.6	63.4
70	98.5	94.3	98.7	97.9	N/A	86.8	98.8	98.8	95.9	96.3	97.7	98.0	96.9	93.1	95.9	90.1	63.3
72	98.5	94.2	98.3	97.8	N/A	87.4	98.9	98.8	95.6	96.2	97.8	98.2	97.0	92.8	96.2	89.5	64.2
74	98.5	94.3	98.2	97.9	N/A	87.6	98.7	98.8	95.5	97.0	98.1	98.2	97.0	93.9	96.1	89.1	63.7
76	98.5	94.0	98.2	97.9	N/A	87.7	98.6	98.5	95.7	97.1	98.0	98.2	96.7	93.1	96.1	87.5	64.8
78	98.4	94.0	98.2	97.8	N/A	88.1	98.5	98.6	95.7	97.2	98.1	98.3	95.2	92.6	96.1	87.1	63.8
80	98.4	93.8	98.4	97.8	N/A	88.5	98.3	97.6	95.6	97.2	98.3	98.5	93.7	92.4	96.3	86.5	64.0
82	98.5	93.4	98.3	97.7	N/A	87.9	98.1	97.2	95.3	97.1	98.4	98.3	93.8	91.9	96.3	85.2	64.2
84	98.6	93.4	98.3	97.7	N/A	88.2	97.7	97.3	95.4	97.1	98.2	98.4	94.0	91.8	96.3	84.9	64.3
86	98.4	93.1	98.4	97.5	N/A	88.3	97.2	97.2	95.2	96.9	98.1	98.2	94.0	92.5	96.2	83.3	64.7
88	98.6	93.0	98.4	97.6	N/A	88.7	97.4	97.3	95.3	97.0	98.1	98.5	94.3	92.2	96.5	82.9	63.9
90	98.3	93.0	98.3	97.5	N/A	88.7	97.5	97.1	95.2	97.1	97.9	98.4	94.3	92.1	96.5	82.5	63.9
92	98.3	92.0	98.3	97.3	N/A	88.0	97.4	97.1	95.0	97.0	97.7	98.4	94.3	91.3	96.4	80.2	64.2
94	98.3	91.8	98.2	97.2	N/A	87.9	97.5	97.0	94.8	96.9	97.4	98.3	94.3	91.1	96.4	0.0	63.7
96	98.4	91.6	98.3	97.2	N/A	87.6	97.5	96.9	94.6	96.9	97.2	98.3	94.4	90.9	96.4	0.0	63.6
98	98.5	91.8	98.2	96.6	N/A	87.3	97.7	97.0	94.7	96.9	96.8	98.4	94.7	90.0	96.5	0.0	63.0
100	98.5	93.2	97.9	96.4	N/A	86.9	97.8	95.0	94.4	97.2	95.8	98.3	94.7	85.4	96.5	0.0	53.0

4.11 I3-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	98.8	97.7	98.2	95.7	N/A	90.3	97.9	96.8	96.7	97.8	90.3	98.4	95.9	73.6	96.5	0.0	39.4
4	98.8	97.3	98.3	97.4	N/A	91.4	97.7	96.7	96.7	97.0	91.5	98.2	95.7	70.3	97.2	0.0	53.7
6	98.5	96.8	98.3	97.6	N/A	90.7	97.7	97.0	96.8	97.3	92.1	98.2	95.8	68.6	96.7	0.0	62.3
8	98.9	96.7	98.3	97.8	N/A	90.9	97.5	97.0	97.0	97.3	92.7	98.2	95.9	69.5	96.6	0.0	66.2
10	98.6	96.9	98.2	97.4	N/A	90.4	97.7	96.9	96.8	97.1	93.0	97.6	95.5	70.0	96.6	92.7	66.7
12	98.5	96.9	98.4	97.8	N/A	90.6	97.9	97.0	97.2	97.5	93.0	97.8	95.9	71.8	96.8	92.3	68.0
14	99.2	97.4	98.5	98.0	N/A	90.9	98.0	97.4	97.4	97.7	94.2	97.9	96.4	86.0	97.2	93.5	69.7
16	99.0	96.6	98.3	98.1	N/A	89.8	97.8	97.2	97.3	97.4	93.7	97.5	95.2	83.3	96.9	92.3	70.0
18	98.8	96.9	98.4	97.9	N/A	89.6	98.2	97.2	97.3	97.4	93.7	97.5	95.6	83.3	96.8	92.5	70.8
20	98.9	97.0	98.3	98.3	N/A	89.5	98.8	97.5	97.4	97.6	94.8	97.5	95.8	84.6	96.9	93.3	73.7
22	98.7	96.4	98.1	98.1	N/A	88.8	98.5	97.4	97.1	97.3	94.1	96.9	96.9	83.8	96.4	92.1	71.5
24	99.0	96.5	98.2	98.1	N/A	88.9	98.9	99.1	97.2	97.4	94.5	96.8	97.3	86.7	96.6	92.5	71.9
26	98.9	96.4	98.1	97.9	N/A	88.0	98.8	98.7	96.9	97.1	94.4	96.4	97.2	95.3	96.2	92.5	73.4
28	99.1	96.5	98.1	98.2	N/A	87.4	98.9	98.9	97.3	96.8	94.4	96.6	97.6	95.6	96.4	93.3	73.6
30	98.9	96.3	97.8	98.0	N/A	86.5	99.0	98.8	97.0	96.6	94.2	96.1	97.4	95.5	96.1	93.1	73.3
32	98.9	96.4	97.8	98.4	N/A	85.9	98.9	99.0	97.5	96.8	95.2	95.7	97.5	95.0	96.2	92.8	89.4
34	98.9	96.3	97.9	98.4	N/A	84.3	98.8	98.7	97.5	96.7	94.8	94.8	97.4	94.5	96.0	92.7	84.9
36	99.1	96.3	99.0	98.3	N/A	83.3	99.0	98.9	97.6	96.7	94.7	98.2	97.6	94.0	95.8	92.4	84.8
38	99.0	96.5	99.0	98.5	N/A	82.7	99.0	99.0	97.8	96.9	94.6	98.3	97.6	95.4	95.9	94.8	83.9
40	99.0	96.4	99.0	98.5	N/A	82.6	99.1	99.0	97.6	96.8	94.2	98.5	97.5	95.5	96.1	94.9	84.7
42	99.0	96.3	98.9	98.4	N/A	83.1	98.9	99.0	97.7	96.6	94.4	98.4	97.4	95.1	95.8	95.0	85.1
44	99.0	96.4	98.7	98.3	N/A	82.8	99.1	99.0	97.6	96.7	94.1	98.1	97.5	95.0	95.5	95.3	85.0
46	99.0	96.6	98.9	98.4	N/A	82.3	99.0	99.1	97.4	96.8	94.2	98.3	97.5	94.9	95.7	95.4	85.5
48	99.0	96.6	98.9	98.5	N/A	83.1	98.9	98.9	97.4	96.8	96.8	98.2	97.7	94.0	95.5	95.1	85.4
50	99.0	97.2	98.6	98.5	N/A	82.9	99.1	99.1	97.4	97.1	97.0	98.2	97.7	95.2	97.1	95.3	84.5
52	99.0	96.8	98.9	98.4	N/A	83.1	99.0	99.0	97.6	97.0	97.3	98.4	97.7	94.8	97.4	94.3	75.3
54	99.0	96.0	99.0	98.5	N/A	82.8	99.1	99.0	97.6	96.9	97.4	98.3	97.6	94.7	96.8	94.2	75.7
56	99.0	95.7	99.1	98.5	N/A	82.9	99.1	99.0	97.4	96.9	97.3	98.2	97.6	94.5	96.8	93.3	76.6
58	98.9	95.5	99.0	98.4	N/A	82.8	99.0	98.9	97.5	96.9	97.1	98.1	97.5	93.9	96.7	93.1	75.6
60	99.1	95.6	99.0	98.4	N/A	82.8	99.0	99.0	97.5	96.9	97.4	98.3	97.6	93.4	96.9	92.7	76.9
62	98.9	95.6	99.0	98.4	N/A	83.0	99.1	98.9	97.5	96.7	97.4	98.3	97.5	95.0	96.8	92.5	77.0
64	99.0	95.7	99.1	98.5	N/A	82.8	99.1	98.9	97.7	97.0	97.7	98.3	97.5	94.7	97.1	92.4	77.6
66	98.9	95.5	98.8	98.4	N/A	84.6	99.0	98.9	97.6	96.8	97.6	97.7	97.5	94.5	96.9	91.0	77.6
68	99.0	95.5	98.8	98.3	N/A	85.3	98.9	98.9	97.6	96.7	97.9	98.0	97.4	94.2	97.0	90.8	78.1
70	99.0	95.6	98.8	98.6	N/A	86.5	98.9	98.9	97.5	96.9	98.0	98.3	97.5	93.8	97.1	90.7	77.8
72	98.9	95.0	98.8	98.4	N/A	87.2	98.8	98.8	97.2	96.5	97.9	98.3	97.2	93.3	97.0	89.7	78.7
74	98.9	95.3	98.9	98.4	N/A	87.8	99.0	98.9	97.4	97.4	98.2	98.4	97.3	94.5	97.1	89.3	78.6
76	98.9	94.9	98.9	98.4	N/A	88.3	98.8	98.9	97.3	97.6	98.2	98.4	97.2	94.1	97.1	88.0	78.7
78	98.8	94.8	98.8	98.3	N/A	88.8	98.7	98.8	97.2	97.3	98.3	98.4	95.5	93.6	97.1	87.3	77.9
80	98.9	94.6	98.9	98.3	N/A	89.6	98.5	97.8	97.3	97.5	98.3	98.4	94.4	93.4	97.1	86.7	78.3
82	98.9	94.0	98.9	98.2	N/A	89.4	98.4	97.5	97.2	97.4	98.5	98.4	94.3	92.7	97.2	85.4	78.3
84	98.9	94.1	98.8	98.2	N/A	89.8	97.9	97.5	97.1	97.4	98.2	98.4	94.5	92.5	97.2	84.9	78.7
86	99.0	94.0	98.9	98.2	N/A	90.0	97.5	97.5	97.1	97.4	98.2	98.5	94.7	93.7	97.3	84.0	78.7
88	99.0	93.5	98.8	98.2	N/A	90.4	97.7	97.5	97.0	97.3	98.1	98.4	94.8	93.2	97.3	82.9	78.7
90	98.7	93.5	98.8	98.1	N/A	90.6	97.5	97.2	96.9	97.3	97.9	98.5	94.7	93.1	97.4	82.3	78.3
92	98.8	92.6	98.8	98.1	N/A	90.8	97.6	97.4	96.9	97.2	97.9	98.5	94.9	92.7	97.4	80.8	79.1
94	98.8	92.5	98.8	98.0	N/A	91.0	97.6	97.3	96.7	97.3	97.8	98.6	94.9	92.1	97.3	0.0	78.5
96	98.9	92.2	98.7	97.9	N/A	91.3	97.7	97.2	96.6	97.3	97.3	98.5	95.0	92.0	97.4	0.0	78.6
98	98.8	92.1	98.7	97.5	N/A	91.5	97.8	97.2	96.4	97.3	97.1	98.5	95.1	91.8	97.3	0.0	77.6
100	99.0	93.8	98.5	97.4	N/A	91.7	97.9	95.4	96.4	97.6	96.1	98.5	95.4	88.6	97.5	0.0	56.3

4.12 I3-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	98.9	98.3	98.5	95.5	N/A	90.6	97.8	N/A	97.1	97.8	90.4	98.3	96.0	73.0	97.6	0.0	46.0
4	98.9	97.8	98.5	97.3	N/A	91.0	97.6	N/A	97.1	97.0	91.5	98.1	95.7	70.3	97.7	0.0	60.3
6	98.6	97.4	98.6	97.5	N/A	90.6	97.9	N/A	97.5	97.3	92.2	98.1	96.0	68.0	97.6	0.0	69.0
8	98.9	97.3	98.5	97.7	N/A	90.4	97.6	N/A	97.5	97.3	92.8	98.0	95.9	68.8	97.5	0.0	72.4
10	98.7	97.7	98.5	97.7	N/A	90.1	97.9	N/A	97.5	97.3	93.3	97.7	95.9	69.6	97.6	93.1	73.1
12	98.7	97.4	98.7	97.8	N/A	90.0	98.0	N/A	97.7	97.6	93.3	97.6	96.0	71.7	97.7	92.8	74.7
14	99.2	97.7	98.6	98.1	N/A	90.0	98.0	N/A	97.6	97.7	94.2	97.6	96.2	85.5	97.6	93.7	76.0
16	99.1	97.2	98.5	98.2	N/A	89.2	97.7	N/A	97.4	97.5	93.8	97.3	95.6	83.0	97.5	92.7	77.0
18	98.9	97.5	98.5	98.0	N/A	88.7	98.3	N/A	97.4	97.5	93.9	97.0	95.7	83.5	97.4	92.9	77.6
20	99.0	97.5	98.4	98.1	N/A	87.9	98.7	N/A	97.5	97.6	94.7	97.1	95.9	84.3	97.3	93.4	80.4
22	99.0	96.7	98.3	98.1	N/A	87.7	98.6	N/A	97.3	97.4	94.2	96.6	97.1	83.5	97.1	92.4	78.1
24	99.1	96.9	98.6	98.0	N/A	86.8	98.9	N/A	97.5	97.5	94.6	96.6	97.5	86.7	97.4	92.9	78.9
26	99.1	96.9	98.5	97.8	N/A	85.2	98.9	N/A	97.3	97.3	94.7	96.3	97.4	95.6	96.9	92.9	80.0
28	99.1	96.8	98.3	98.0	N/A	83.2	98.9	N/A	97.4	96.7	94.5	96.1	97.6	95.7	97.0	93.3	79.7
30	98.9	96.8	98.2	98.1	N/A	81.3	99.0	N/A	97.3	96.8	94.2	95.5	97.5	95.4	96.7	93.3	79.7
32	99.1	96.7	98.2	98.5	N/A	79.7	98.9	N/A	97.1	96.8	95.1	94.9	97.6	95.2	96.9	92.9	91.9
34	99.1	96.6	98.2	98.3	N/A	76.4	98.9	N/A	97.8	96.9	95.2	94.0	97.6	94.8	96.8	93.2	88.2
36	99.2	96.8	99.2	98.3	N/A	75.1	99.0	N/A	97.8	96.9	94.9	92.9	97.6	94.0	96.8	93.0	88.1
38	99.2	96.6	99.1	98.5	N/A	75.2	99.0	N/A	97.9	97.0	94.7	98.0	97.7	95.4	96.6	94.7	87.1
40	99.2	96.3	99.1	98.4	N/A	75.5	99.2	N/A	97.9	96.9	94.3	98.2	97.7	95.6	96.6	95.1	88.3
42	99.1	96.6	99.2	98.5	N/A	75.6	99.0	N/A	97.8	96.9	94.2	98.3	97.6	95.3	96.4	95.2	88.6
44	99.0	96.8	99.0	98.3	N/A	75.6	99.1	N/A	97.6	96.8	94.2	98.1	97.5	95.1	96.3	95.3	88.3
46	99.1	97.0	99.1	98.4	N/A	75.2	99.1	N/A	97.7	96.9	94.1	98.2	97.7	95.1	96.4	95.5	88.8
48	99.1	97.2	99.0	98.5	N/A	75.8	99.1	N/A	97.6	96.9	96.9	98.2	97.7	94.2	96.3	95.3	88.9
50	99.1	97.7	98.9	98.6	N/A	75.7	99.1	N/A	97.5	97.2	97.1	98.2	97.7	95.4	97.7	95.4	88.2
52	99.1	97.1	99.0	98.4	N/A	75.5	99.1	N/A	97.6	97.0	97.2	98.2	97.7	94.9	97.9	94.3	81.9
54	99.0	96.4	99.1	98.5	N/A	75.2	99.1	N/A	97.6	97.0	97.3	98.1	97.6	94.8	97.4	94.3	82.6
56	99.1	96.1	99.1	98.3	N/A	75.7	99.1	N/A	97.6	97.0	97.3	97.9	97.7	94.6	97.2	93.3	83.4
58	99.1	96.0	99.1	98.3	N/A	75.2	99.0	N/A	97.7	97.0	97.2	98.1	97.6	94.1	97.3	93.2	82.9
60	99.1	96.1	99.2	98.4	N/A	75.2	99.0	N/A	97.7	97.0	97.5	98.0	97.6	93.6	97.3	92.8	83.7
62	99.0	96.1	99.2	98.4	N/A	75.7	99.2	N/A	97.8	96.9	97.5	98.1	97.5	95.0	97.4	92.7	84.6
64	99.1	96.3	99.1	98.6	N/A	75.8	99.1	N/A	97.9	97.1	97.7	98.0	97.5	94.8	97.4	92.5	84.6
66	99.0	96.2	99.0	98.4	N/A	75.6	99.0	N/A	97.8	97.0	97.8	97.3	97.5	94.7	97.4	91.4	85.0
68	99.1	95.9	98.9	98.4	N/A	78.6	99.0	N/A	97.9	96.8	97.8	97.6	97.4	94.3	97.5	90.9	85.3
70	99.1	96.1	98.9	98.5	N/A	80.9	99.0	N/A	97.7	97.0	97.9	97.9	97.5	94.0	97.5	90.8	84.9
72	99.0	95.6	99.0	98.4	N/A	82.9	98.9	N/A	97.6	96.6	98.0	98.2	97.3	93.4	97.5	90.1	85.6
74	99.0	95.8	99.1	98.4	N/A	84.6	99.0	N/A	97.7	97.4	98.2	98.3	97.4	94.9	97.7	89.3	85.5
76	99.0	95.4	99.1	98.5	N/A	85.9	98.9	N/A	97.6	97.6	98.2	98.3	97.3	94.3	97.5	88.1	85.9
78	98.9	95.3	99.1	98.3	N/A	87.1	98.7	N/A	97.5	97.4	98.3	98.3	95.6	94.0	97.6	87.5	85.1
80	98.9	95.1	99.0	98.3	N/A	88.0	98.6	N/A	97.6	97.5	98.5	98.4	94.5	93.9	97.6	86.9	85.5
82	99.0	94.5	99.1	98.3	N/A	88.3	98.5	N/A	97.6	97.4	98.5	98.4	94.4	93.3	97.7	85.4	85.8
84	99.0	94.5	99.0	98.2	N/A	88.9	98.0	N/A	97.5	97.5	98.3	98.4	94.6	92.9	97.6	85.1	85.8
86	99.0	94.3	99.1	98.2	N/A	89.2	97.7	N/A	97.5	97.4	98.2	98.4	94.7	94.1	97.7	83.9	86.0
88	99.1	94.0	99.0	98.2	N/A	89.9	97.8	N/A	97.4	97.4	98.1	98.4	94.9	93.6	97.7	83.1	86.0
90	98.8	93.9	99.0	98.1	N/A	90.1	97.7	N/A	97.4	97.4	98.0	98.5	94.8	93.5	97.7	82.5	85.8
92	98.9	93.1	99.1	98.0	N/A	90.3	97.8	N/A	97.3	97.3	97.9	98.5	95.0	93.1	97.7	80.8	86.5
94	98.9	92.9	99.1	98.0	N/A	90.8	97.8	N/A	97.2	97.4	97.8	98.5	95.0	92.7	97.7	0.0	86.1
96	98.9	92.7	99.0	97.9	N/A	91.0	97.8	N/A	97.1	97.4	97.5	98.5	95.1	92.3	97.7	0.0	86.1
98	99.0	92.7	98.9	97.5	N/A	91.4	97.8	N/A	97.0	97.4	97.2	98.5	95.3	92.6	97.8	0.0	85.0
100	99.1	94.5	98.7	97.3	N/A	91.8	97.9	N/A	96.9	97.7	96.2	98.5	95.5	89.8	97.8	0.0	54.8

4.13 I4-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	81.7	79.9	76.7	73.1	0.0	N/A	55.5	69.7	N/A	78.1	50.8	84.3	65.1	10.3	70.0	0.0	26.0
4	83.4	81.3	78.5	77.4	0.0	N/A	56.6	70.8	N/A	73.2	55.7	81.8	66.0	10.7	71.3	0.0	45.4
6	83.4	80.8	79.7	79.1	0.0	N/A	53.7	72.1	N/A	73.2	57.4	80.9	65.9	11.0	70.7	0.0	51.9
8	83.4	81.5	79.3	80.0	0.0	N/A	53.9	72.1	N/A	74.5	59.4	80.0	66.3	11.1	71.6	0.0	56.4
10	83.0	81.1	79.6	80.3	0.0	N/A	53.5	72.5	N/A	75.0	60.8	79.4	66.9	10.8	70.9	65.8	56.0
12	82.7	80.6	79.5	79.8	0.0	N/A	53.9	72.3	N/A	74.8	61.9	78.4	66.0	11.7	70.1	64.9	56.4
14	87.3	79.3	78.3	79.9	0.0	N/A	52.3	71.9	N/A	74.7	62.0	76.6	65.5	58.7	70.2	64.5	56.5
16	87.3	79.7	79.4	80.4	0.0	N/A	52.7	72.9	N/A	75.4	63.7	76.3	65.7	56.8	70.6	64.9	58.3
18	87.1	79.8	79.3	80.9	0.0	N/A	60.9	73.4	N/A	75.7	64.9	76.0	66.5	58.1	70.4	66.0	57.7
20	86.8	80.0	79.7	81.2	0.0	N/A	67.1	73.6	N/A	76.2	66.9	75.3	67.2	59.0	70.3	66.8	58.6
22	86.9	79.2	80.0	81.1	0.0	N/A	69.0	76.4	N/A	76.8	67.3	74.2	74.0	58.9	70.8	67.1	59.0
24	85.6	78.1	78.6	80.5	0.0	N/A	68.8	84.8	N/A	75.4	65.9	72.0	74.2	59.4	69.7	66.0	58.2
26	88.6	78.1	79.4	80.8	0.0	N/A	68.6	85.5	N/A	75.7	66.3	71.6	75.5	75.7	70.5	67.2	59.5
28	88.9	77.9	79.1	80.3	0.0	N/A	66.5	85.2	N/A	70.1	66.4	70.7	75.0	75.6	69.7	67.7	59.3
30	89.6	77.5	79.2	80.7	0.0	N/A	67.1	85.5	N/A	71.0	67.0	69.7	75.9	75.5	70.4	68.1	60.4
32	89.6	77.7	79.3	88.8	0.0	N/A	67.2	85.7	N/A	71.8	77.1	69.3	76.2	74.6	70.3	68.5	74.3
34	89.0	75.4	78.3	87.8	0.0	N/A	66.4	84.8	N/A	71.1	77.6	67.0	74.9	73.5	69.5	67.5	70.4
36	89.1	74.5	78.1	88.0	0.0	N/A	66.7	84.8	N/A	70.9	77.1	65.7	75.0	70.7	68.8	67.0	69.9
38	89.3	73.5	77.6	88.5	0.0	N/A	67.0	85.2	N/A	72.1	77.5	64.4	76.1	76.6	68.3	74.2	70.0
40	89.0	72.4	84.9	88.1	0.0	N/A	66.3	84.4	N/A	71.0	77.6	62.6	75.1	76.1	68.1	74.5	70.4
42	89.4	71.4	84.7	88.2	0.0	N/A	67.1	85.3	N/A	72.0	78.2	61.2	75.9	74.7	68.1	74.4	70.9
44	89.4	72.3	84.2	87.4	0.0	N/A	67.1	85.0	N/A	71.0	78.1	58.2	75.1	74.0	67.8	74.6	70.2
46	89.0	72.1	84.9	87.5	0.0	N/A	66.9	84.6	N/A	71.5	79.0	84.1	75.0	73.3	67.1	74.5	71.0
48	89.1	73.3	83.6	88.4	0.0	N/A	67.3	85.2	N/A	71.5	84.0	84.9	75.2	70.0	67.1	74.5	71.2
50	89.4	73.5	82.7	88.3	0.0	N/A	67.1	85.1	N/A	72.2	84.9	85.1	75.4	75.9	65.9	74.5	70.3
52	89.2	73.4	84.9	88.4	0.0	N/A	67.7	85.1	N/A	72.5	85.5	84.4	75.5	74.9	68.5	73.9	62.4
54	88.8	72.6	85.5	87.8	0.0	N/A	67.2	85.1	N/A	72.1	85.4	84.6	75.2	73.5	68.9	73.2	62.6
56	88.7	72.6	87.3	88.2	0.0	N/A	67.9	85.4	N/A	72.2	85.9	84.6	75.8	72.9	69.5	72.7	62.8
58	88.9	72.4	86.4	88.0	0.0	N/A	68.3	85.3	N/A	72.6	85.2	82.2	75.6	71.9	69.0	72.6	62.4
60	89.0	73.8	86.6	87.9	0.0	N/A	68.1	85.4	N/A	72.4	85.9	82.4	75.7	70.0	69.7	72.2	63.7
62	89.0	74.5	85.9	88.3	0.0	N/A	68.6	85.2	N/A	72.5	86.1	82.6	76.1	74.9	69.7	71.8	63.3
64	89.0	75.6	84.7	88.6	0.0	N/A	68.5	85.6	N/A	72.8	86.6	82.8	75.7	74.3	70.3	71.7	64.0
66	88.8	76.4	85.7	88.4	0.0	N/A	68.4	85.3	N/A	72.7	86.4	83.2	75.6	73.5	70.4	67.5	64.1
68	88.6	76.7	85.0	88.3	0.0	N/A	68.9	85.9	N/A	72.6	86.8	83.1	75.5	72.3	69.9	67.0	63.8
70	88.7	77.6	85.2	89.0	0.0	N/A	69.2	85.7	N/A	73.0	87.1	83.8	75.7	71.7	70.4	66.7	64.0
72	87.8	77.3	85.8	88.5	0.0	N/A	69.5	85.5	N/A	72.2	87.0	84.1	75.2	69.1	70.5	66.0	64.4
74	87.8	77.9	85.3	88.3	0.0	N/A	71.2	85.8	N/A	78.2	87.1	84.3	75.0	74.4	70.8	65.5	64.7
76	86.9	77.6	85.4	88.2	0.0	N/A	71.2	85.3	N/A	78.9	87.1	84.2	74.6	72.9	70.5	64.3	64.4
78	84.9	78.0	84.9	87.8	0.0	N/A	70.9	78.5	N/A	79.1	87.0	84.8	67.1	71.4	70.6	63.5	64.1
80	84.9	78.0	85.0	87.3	0.0	N/A	68.6	74.9	N/A	79.1	87.1	84.9	59.5	70.7	70.5	62.7	64.1
82	85.6	78.1	85.3	87.3	0.0	N/A	63.8	75.3	N/A	78.9	87.4	85.6	60.5	69.6	70.7	61.9	64.4
84	86.0	77.9	84.8	86.5	0.0	N/A	55.0	74.7	N/A	79.1	85.4	85.8	60.7	67.7	70.9	60.5	64.2
86	86.2	78.0	85.3	86.3	0.0	N/A	54.7	74.9	N/A	79.1	85.2	86.1	61.5	71.6	71.1	59.4	64.4
88	86.8	77.7	84.7	85.5	0.0	N/A	55.7	74.7	N/A	78.9	84.7	86.6	61.9	70.0	71.1	58.2	64.1
90	83.3	78.0	84.2	84.9	0.0	N/A	56.1	74.6	N/A	79.1	83.8	86.6	62.6	71.5	71.4	57.7	64.4
92	83.8	77.2	84.2	84.2	0.0	N/A	56.8	74.5	N/A	78.5	83.1	86.7	62.9	70.3	71.1	55.6	64.2
94	84.5	76.9	83.4	83.0	0.0	N/A	57.5	74.5	N/A	78.7	82.3	86.7	63.5	69.0	71.2	0.0	63.8
96	84.8	76.4	83.3	81.9	0.0	N/A	57.7	74.3	N/A	78.3	80.9	86.8	63.8	67.1	71.3	0.0	63.7
98	85.4	76.0	81.9	79.3	0.0	N/A	62.2	74.3	N/A	77.8	79.4	86.6	64.5	65.5	71.4	0.0	62.9
100	86.0	76.4	79.2	75.6	0.0	N/A	63.2	62.5	N/A	79.9	74.7	86.7	65.0	60.6	71.1	0.0	30.2

4.14 I4-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	82.7	83.0	83.2	72.0	0.0	N/A	55.6	N/A	68.1	79.1	50.4	84.2	59.3	10.0	73.2	0.0	36.4
4	83.2	84.5	84.0	75.4	0.0	N/A	57.5	N/A	69.2	72.6	53.8	75.7	60.3	10.3	74.4	0.0	45.6
6	83.7	83.9	84.1	76.8	0.0	N/A	56.8	N/A	70.2	73.3	55.5	74.5	60.5	10.6	73.5	0.0	52.0
8	83.1	84.4	84.2	78.4	0.0	N/A	56.1	N/A	71.1	73.8	58.3	73.5	61.1	10.7	74.1	0.0	55.0
10	83.4	84.7	84.3	78.8	0.0	N/A	55.8	N/A	71.1	74.3	59.8	72.4	60.7	10.8	74.0	64.1	54.8
12	82.7	84.5	84.5	78.9	0.0	N/A	56.8	N/A	71.6	74.6	61.0	71.3	61.4	11.7	74.2	64.8	55.5
14	88.0	84.4	84.7	79.4	0.0	N/A	55.9	N/A	72.1	75.0	62.4	69.8	60.7	59.7	73.7	65.4	56.3
16	87.7	84.5	84.7	79.2	0.0	N/A	56.4	N/A	72.6	75.1	63.5	68.9	61.3	58.4	73.8	65.6	56.6
18	87.1	84.4	84.2	79.7	0.0	N/A	60.9	N/A	72.3	75.1	64.4	68.0	61.1	58.9	74.1	66.2	56.8
20	87.0	84.9	84.3	79.0	0.0	N/A	67.0	N/A	72.4	75.3	65.7	66.2	61.1	58.9	73.6	66.1	57.0
22	86.9	84.5	84.3	79.4	0.0	N/A	68.6	N/A	72.8	75.3	66.7	65.5	68.9	58.5	73.3	66.4	60.4
24	86.1	84.0	83.6	78.5	0.0	N/A	69.4	N/A	72.8	75.0	66.2	63.7	69.8	58.4	73.1	66.5	57.8
26	89.4	83.7	84.4	79.0	0.0	N/A	70.4	N/A	73.0	74.8	66.0	62.8	70.2	75.4	73.2	66.9	59.1
28	89.7	83.4	83.7	78.4	0.0	N/A	68.7	N/A	73.3	71.1	66.1	62.0	69.9	75.2	73.0	67.3	58.8
30	89.4	83.3	83.9	77.5	0.0	N/A	69.2	N/A	73.1	71.1	65.7	60.1	70.1	74.7	73.3	66.9	59.2
32	89.8	83.2	83.8	87.6	0.0	N/A	69.5	N/A	73.4	71.5	77.2	59.3	70.6	73.5	73.4	67.0	70.1
34	89.7	82.8	83.6	87.1	0.0	N/A	68.8	N/A	73.9	71.5	78.5	57.9	70.1	72.0	73.3	67.2	68.2
36	89.6	81.8	83.0	87.3	0.0	N/A	69.3	N/A	73.3	71.2	78.0	56.5	70.3	69.4	72.2	66.6	67.9
38	89.8	81.5	82.5	87.6	0.0	N/A	69.5	N/A	73.2	71.6	78.6	55.3	70.7	75.7	72.1	73.2	68.2
40	89.5	81.1	82.7	87.2	0.0	N/A	68.8	N/A	73.1	71.6	78.8	53.3	70.6	75.1	72.1	73.3	68.2
42	90.1	79.9	88.4	87.8	0.0	N/A	70.0	N/A	73.0	72.4	79.1	52.2	70.8	74.4	71.1	73.7	68.2
44	89.6	79.1	87.8	87.3	0.0	N/A	69.5	N/A	72.0	71.3	79.2	49.8	70.2	73.1	62.9	73.3	68.3
46	89.8	78.4	88.4	87.2	0.0	N/A	69.5	N/A	72.0	71.6	80.2	48.1	70.1	72.3	61.4	73.8	68.0
48	89.8	76.9	87.7	87.7	0.0	N/A	70.0	N/A	71.6	71.9	84.4	44.3	70.5	69.2	60.1	73.8	69.0
50	89.8	78.1	86.4	87.5	0.0	N/A	69.8	N/A	70.2	72.1	84.9	82.0	70.2	75.0	60.1	73.2	68.2
52	89.8	78.0	88.6	87.6	0.0	N/A	70.4	N/A	71.5	72.5	85.6	82.4	70.5	73.8	58.6	72.9	60.5
54	89.6	78.9	89.0	87.5	0.0	N/A	70.2	N/A	71.7	72.3	85.7	79.5	70.1	72.9	58.6	72.1	60.4
56	89.6	79.6	90.5	87.7	0.0	N/A	71.0	N/A	72.5	72.5	85.8	80.1	70.8	72.2	59.0	72.2	61.2
58	89.5	80.2	89.6	87.8	0.0	N/A	71.1	N/A	72.7	73.1	85.6	80.2	70.8	71.0	71.8	71.7	60.6
60	89.6	81.3	89.0	87.4	0.0	N/A	70.9	N/A	73.2	72.9	86.1	80.8	70.9	68.8	73.1	71.3	61.6
62	89.3	81.3	88.9	87.6	0.0	N/A	71.0	N/A	72.9	72.6	86.3	81.1	70.7	74.3	72.9	70.5	61.0
64	89.2	81.8	88.4	87.8	0.0	N/A	71.2	N/A	73.4	72.8	86.3	81.1	70.9	73.5	73.3	70.6	61.9
66	89.4	82.6	89.1	87.9	0.0	N/A	71.5	N/A	73.7	72.5	86.7	81.6	70.8	72.8	73.7	67.1	61.5
68	89.2	82.7	88.9	88.1	0.0	N/A	71.6	N/A	73.7	72.8	86.9	81.6	71.1	72.1	73.4	66.7	62.3
70	88.9	82.6	88.5	88.1	0.0	N/A	71.8	N/A	73.3	72.8	86.8	81.7	70.7	70.6	73.2	66.2	62.3
72	88.7	82.7	89.1	88.1	0.0	N/A	72.3	N/A	73.1	72.3	87.1	82.0	71.0	68.4	73.6	65.9	62.3
74	88.5	83.2	89.1	87.6	0.0	N/A	72.5	N/A	73.1	77.8	87.2	82.2	70.5	73.8	73.8	65.1	62.3
76	87.5	82.8	89.3	87.4	0.0	N/A	73.0	N/A	72.5	78.6	87.2	82.4	70.3	72.6	73.3	63.9	62.2
78	85.3	82.8	88.8	87.3	0.0	N/A	72.3	N/A	72.3	79.1	87.3	82.7	61.1	70.9	73.4	63.1	62.2
80	85.5	82.7	88.8	86.6	0.0	N/A	70.5	N/A	72.2	79.0	87.3	82.7	53.3	70.2	73.5	62.4	62.6
82	85.9	82.4	89.2	86.4	0.0	N/A	64.6	N/A	71.8	79.1	87.5	83.4	54.4	69.1	73.6	61.4	62.7
84	86.4	82.3	88.7	85.8	0.0	N/A	58.6	N/A	71.6	79.0	85.3	83.6	55.0	66.7	73.6	60.7	62.6
86	86.7	81.9	89.2	85.3	0.0	N/A	58.2	N/A	71.3	79.3	85.1	83.8	55.6	71.2	73.5	59.3	62.8
88	87.1	81.4	88.7	84.7	0.0	N/A	59.5	N/A	71.0	79.2	84.5	84.2	56.3	70.0	73.7	58.1	62.6
90	83.3	81.4	88.4	83.7	0.0	N/A	59.7	N/A	70.7	79.2	83.7	84.5	56.8	71.1	73.9	57.2	62.4
92	83.8	80.5	88.5	82.9	0.0	N/A	60.5	N/A	70.3	78.9	83.1	84.8	57.4	69.7	73.9	55.4	62.6
94	84.5	80.3	87.9	82.0	0.0	N/A	61.2	N/A	69.8	79.0	82.2	85.0	58.2	68.7	73.9	0.0	62.4
96	85.0	79.6	87.7	80.4	0.0	N/A	61.0	N/A	69.2	78.6	81.0	85.2	58.7	66.2	73.8	0.0	62.0
98	85.6	79.3	86.6	77.6	0.0	N/A	64.0	N/A	68.3	78.3	79.4	85.2	59.4	66.5	74.1	0.0	61.7
100	86.1	78.8	84.3	73.2	0.0	N/A	64.3	N/A	66.6	80.4	74.8	85.1	60.3	62.0	73.7	0.0	27.3

4.15 I4-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	81.0	80.5	84.4	75.8	N/A	N/A	56.2	N/A	65.4	79.4	50.3	83.5	57.2	9.7	74.3	0.0	41.8
4	82.5	82.7	85.6	78.9	N/A	N/A	58.0	N/A	66.7	72.7	53.6	69.5	58.2	10.2	75.0	0.0	45.5
6	82.5	82.4	85.9	80.2	N/A	N/A	57.7	N/A	67.0	73.1	55.5	67.5	57.9	10.6	75.5	0.0	51.6
8	82.3	82.5	86.0	80.8	N/A	N/A	56.4	N/A	68.0	73.4	57.8	66.4	58.0	10.4	75.3	0.0	54.3
10	82.2	82.9	86.1	81.5	N/A	N/A	57.1	N/A	68.4	74.6	59.6	65.4	58.2	10.7	75.4	65.7	54.8
12	81.8	82.7	86.2	81.8	N/A	N/A	57.9	N/A	68.2	74.3	61.0	64.5	58.2	11.3	75.8	65.8	55.3
14	87.0	83.0	86.2	81.8	N/A	N/A	56.6	N/A	68.8	74.6	62.0	63.4	58.3	60.4	75.4	66.6	56.3
16	86.5	82.6	86.0	82.0	N/A	N/A	57.4	N/A	68.5	74.2	62.6	61.8	58.4	58.3	74.8	66.2	55.8
18	86.7	82.8	86.1	82.1	N/A	N/A	60.4	N/A	69.1	74.4	63.9	60.1	58.5	58.4	75.3	66.9	56.7
20	86.0	82.5	85.9	82.0	N/A	N/A	67.5	N/A	68.8	75.0	65.9	58.7	58.1	58.9	75.0	67.4	56.4
22	86.0	82.3	85.9	82.0	N/A	N/A	68.7	N/A	69.4	74.9	65.9	58.3	65.9	58.4	74.8	67.4	57.6
24	85.8	82.2	85.7	81.6	N/A	N/A	69.6	N/A	69.5	75.0	65.8	56.2	67.3	57.9	75.0	67.8	58.1
26	89.0	81.8	86.1	82.0	N/A	N/A	70.2	N/A	69.8	74.8	66.4	55.4	67.8	75.2	75.0	68.3	58.1
28	89.6	81.5	85.8	81.4	N/A	N/A	70.2	N/A	70.1	71.4	66.2	54.3	67.9	74.8	74.7	68.8	58.9
30	89.1	80.9	85.3	80.0	N/A	N/A	69.8	N/A	69.7	71.4	65.8	52.6	67.4	73.7	74.8	68.3	58.1
32	89.4	80.6	85.4	88.7	N/A	N/A	70.2	N/A	69.9	72.0	77.2	51.6	67.8	72.9	74.8	68.0	69.2
34	89.3	80.0	85.0	88.7	N/A	N/A	69.9	N/A	70.0	70.9	78.3	50.3	67.5	71.4	74.6	67.6	66.7
36	89.2	79.1	84.6	88.8	N/A	N/A	70.1	N/A	69.8	71.8	78.6	48.8	67.7	68.7	73.9	67.8	67.6
38	89.2	78.2	84.1	88.8	N/A	N/A	70.4	N/A	69.5	72.2	78.8	47.9	68.1	75.1	73.6	73.7	67.3
40	89.1	77.7	84.0	88.6	N/A	N/A	69.9	N/A	69.2	71.6	79.1	46.0	67.4	74.2	72.7	74.0	67.1
42	89.6	76.7	85.6	89.0	N/A	N/A	70.7	N/A	68.9	72.3	79.1	44.7	68.0	73.3	63.2	74.2	67.8
44	89.0	75.2	88.9	88.3	N/A	N/A	70.0	N/A	68.2	71.9	79.3	42.3	67.7	72.3	62.6	74.0	67.6
46	89.6	74.2	89.5	88.6	N/A	N/A	70.2	N/A	67.9	71.8	80.6	40.7	68.0	71.3	62.0	74.2	67.4
48	89.3	71.5	88.4	88.7	N/A	N/A	70.4	N/A	67.2	72.0	84.4	36.6	67.8	68.2	61.2	74.1	68.1
50	89.3	73.2	87.5	88.8	N/A	N/A	70.5	N/A	65.8	72.2	84.8	81.9	67.6	74.2	61.1	73.9	67.5
52	89.6	73.4	89.8	88.7	N/A	N/A	71.0	N/A	67.3	72.3	85.7	83.1	68.4	73.5	59.8	73.6	59.7
54	89.0	74.8	90.4	88.6	N/A	N/A	71.2	N/A	67.8	72.3	85.4	80.3	68.1	72.3	59.4	73.2	59.9
56	89.3	76.1	91.3	89.0	N/A	N/A	71.3	N/A	68.6	72.7	85.9	81.2	68.3	71.1	58.2	72.5	60.3
58	89.1	76.7	90.6	88.9	N/A	N/A	71.7	N/A	68.9	72.6	85.6	81.1	68.1	69.8	58.9	72.0	60.2
60	89.1	77.5	89.6	88.6	N/A	N/A	71.3	N/A	69.4	72.5	85.7	81.5	68.1	67.4	60.4	71.6	60.9
62	89.2	78.6	90.2	88.7	N/A	N/A	71.9	N/A	69.7	72.8	86.2	82.1	68.6	73.4	74.6	71.4	60.9
64	89.3	79.2	89.8	89.1	N/A	N/A	72.0	N/A	70.2	73.1	86.4	82.2	68.4	72.7	74.8	71.3	61.5
66	89.0	79.5	90.3	88.8	N/A	N/A	72.2	N/A	70.1	72.8	86.6	82.4	68.5	72.0	75.0	68.0	61.5
68	89.1	79.9	90.2	89.1	N/A	N/A	72.8	N/A	70.4	72.9	86.6	82.6	68.6	71.2	75.2	67.7	61.8
70	88.7	80.2	90.1	89.3	N/A	N/A	73.1	N/A	69.9	72.8	86.8	82.7	68.5	69.8	75.2	67.3	61.7
72	88.5	80.4	90.4	89.2	N/A	N/A	73.4	N/A	69.9	72.7	86.9	83.1	68.8	67.4	75.1	67.0	62.1
74	88.1	80.9	90.2	89.0	N/A	N/A	73.0	N/A	69.7	77.5	87.0	83.3	68.3	72.9	75.4	66.5	61.9
76	87.4	80.9	90.6	89.1	N/A	N/A	73.2	N/A	69.7	78.7	87.4	83.4	68.5	71.8	75.1	65.3	62.0
78	84.5	80.6	90.0	88.5	N/A	N/A	72.7	N/A	69.1	78.8	87.1	83.4	58.1	70.1	74.9	64.0	61.9
80	84.9	80.7	90.2	88.4	N/A	N/A	71.3	N/A	69.2	79.1	87.4	83.9	50.6	69.5	75.2	63.6	62.4
82	85.2	80.2	90.4	87.9	N/A	N/A	64.6	N/A	68.8	79.0	87.4	84.1	51.4	67.9	75.1	62.2	62.2
84	85.6	80.2	90.1	87.4	N/A	N/A	59.2	N/A	68.6	79.0	85.0	84.4	52.0	65.4	75.2	61.7	62.4
86	85.9	79.9	90.4	87.0	N/A	N/A	59.3	N/A	68.4	79.0	84.7	84.6	52.9	70.6	75.1	60.3	62.5
88	86.6	79.7	90.2	86.4	N/A	N/A	60.5	N/A	68.2	79.1	84.5	85.0	53.5	69.6	75.4	59.3	62.2
90	82.4	79.6	89.9	85.8	N/A	N/A	60.7	N/A	68.0	79.2	83.6	85.4	54.3	70.4	75.4	58.5	62.4
92	82.8	78.5	89.8	85.1	N/A	N/A	61.6	N/A	67.2	78.9	83.0	85.4	54.9	69.2	75.1	56.2	62.3
94	83.5	78.2	89.2	84.1	N/A	N/A	62.1	N/A	67.0	79.0	82.0	85.7	55.7	67.8	75.1	0.0	61.9
96	84.1	77.7	89.1	82.9	N/A	N/A	62.1	N/A	66.7	78.8	80.9	85.8	56.3	65.6	75.3	0.0	62.1
98	84.8	77.7	88.3	80.5	N/A	N/A	64.4	N/A	65.9	78.6	79.5	85.8	57.4	66.1	75.4	0.0	61.1
100	85.3	76.6	86.2	76.3	N/A	N/A	64.5	N/A	64.2	80.6	74.7	85.7	58.3	61.8	75.1	0.0	25.2

4.16 I4-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	79.1	82.4	85.4	74.7	N/A	N/A	57.7	N/A	63.4	80.0	51.2	83.7	55.4	10.5	75.3	0.0	44.1
4	80.5	83.9	86.1	78.1	N/A	N/A	59.4	N/A	64.5	72.8	54.1	64.0	55.9	10.6	75.8	0.0	44.8
6	80.9	83.0	86.3	79.3	N/A	N/A	59.4	N/A	65.1	73.9	56.3	62.3	55.8	10.8	76.0	0.0	51.1
8	80.9	83.5	86.3	80.2	N/A	N/A	58.6	N/A	65.4	74.2	58.4	61.1	56.2	10.9	76.1	0.0	53.7
10	80.6	83.5	86.6	80.7	N/A	N/A	58.9	N/A	65.4	74.9	60.1	59.7	56.3	11.2	76.2	65.3	54.3
12	80.4	83.8	86.3	80.9	N/A	N/A	59.5	N/A	65.6	74.6	61.1	58.5	56.2	11.6	76.3	65.3	54.5
14	85.9	83.5	86.6	81.5	N/A	N/A	58.6	N/A	65.5	74.9	62.2	57.3	56.3	62.8	76.2	65.9	55.4
16	85.4	83.1	86.7	81.5	N/A	N/A	59.6	N/A	66.1	74.9	63.3	56.4	56.8	60.2	75.7	65.9	55.1
18	85.3	83.5	86.6	81.6	N/A	N/A	61.2	N/A	66.1	75.0	64.1	54.3	56.5	60.3	76.2	66.4	56.1
20	84.5	83.1	86.4	81.5	N/A	N/A	68.5	N/A	66.2	75.3	66.1	53.2	56.6	60.3	76.0	66.8	55.9
22	84.9	82.9	86.3	81.2	N/A	N/A	69.4	N/A	66.7	75.4	66.2	52.5	64.1	59.7	75.8	66.9	58.6
24	84.5	82.4	86.1	81.0	N/A	N/A	70.2	N/A	66.6	75.4	66.3	50.6	65.4	59.7	75.8	67.3	56.9
26	88.3	82.2	86.4	80.9	N/A	N/A	70.7	N/A	66.9	75.2	66.4	49.9	65.7	60.0	75.9	67.6	57.7
28	88.5	81.7	86.1	80.5	N/A	N/A	71.4	N/A	67.1	72.7	66.6	48.6	66.0	75.6	75.7	68.3	58.4
30	88.4	77.6	85.7	79.3	N/A	N/A	71.2	N/A	66.8	72.9	66.2	46.6	65.6	75.1	75.8	67.8	57.2
32	88.7	76.9	85.6	88.7	N/A	N/A	71.5	N/A	66.9	73.3	77.9	46.2	66.0	74.4	75.6	67.5	68.5
34	88.5	76.5	85.3	88.3	N/A	N/A	71.0	N/A	67.3	72.5	79.1	44.6	65.7	73.7	75.6	67.3	66.5
36	88.6	74.8	84.7	88.5	N/A	N/A	71.4	N/A	67.1	73.3	79.3	43.3	65.9	72.8	74.8	67.4	66.9
38	88.5	73.6	84.4	88.5	N/A	N/A	71.6	N/A	66.6	73.2	79.2	42.3	66.0	71.1	73.8	73.4	66.6
40	88.3	71.2	83.9	88.2	N/A	N/A	71.0	N/A	65.8	72.9	79.6	40.1	65.4	75.9	64.8	73.3	66.4
42	88.8	58.7	84.0	88.4	N/A	N/A	71.8	N/A	65.7	73.5	79.7	39.2	66.1	74.6	63.2	73.6	66.6
44	88.4	59.3	83.6	87.8	N/A	N/A	71.3	N/A	65.1	73.1	79.7	37.0	65.8	73.7	62.9	73.4	67.2
46	88.8	59.7	89.8	88.0	N/A	N/A	71.4	N/A	64.7	73.2	80.8	35.5	66.0	73.5	62.7	73.6	66.6
48	88.6	59.1	89.1	88.3	N/A	N/A	71.8	N/A	64.0	73.4	84.7	31.8	66.0	72.7	61.7	73.6	67.1
50	88.6	59.6	88.3	88.3	N/A	N/A	71.6	N/A	62.2	73.6	85.1	81.8	65.9	71.4	61.7	73.2	66.9
52	88.8	58.1	90.4	88.1	N/A	N/A	72.1	N/A	63.9	73.6	85.8	82.9	66.3	69.0	60.3	72.8	59.1
54	88.5	57.9	91.0	88.2	N/A	N/A	72.1	N/A	64.8	73.7	85.7	80.7	66.2	74.0	60.0	72.5	59.3
56	88.6	57.1	91.0	88.5	N/A	N/A	72.6	N/A	65.5	74.0	86.0	81.2	66.7	73.1	58.5	72.0	60.1
58	88.5	57.8	89.6	88.3	N/A	N/A	72.6	N/A	65.9	73.9	85.7	81.4	66.4	72.4	58.9	71.6	59.7
60	88.5	76.5	90.0	88.2	N/A	N/A	72.5	N/A	66.3	73.7	86.0	81.9	66.5	72.1	59.9	71.4	60.3
62	88.5	78.9	90.5	88.3	N/A	N/A	72.9	N/A	66.9	74.0	86.3	82.3	66.8	71.4	61.2	70.9	60.4
64	88.8	80.1	90.4	88.7	N/A	N/A	73.1	N/A	67.4	74.4	86.8	82.6	67.1	69.9	75.7	70.8	61.0
66	88.5	80.5	90.7	88.4	N/A	N/A	73.3	N/A	67.3	74.0	86.7	82.8	66.8	74.0	75.9	67.4	60.5
68	88.4	80.7	90.4	88.7	N/A	N/A	73.8	N/A	67.3	74.2	86.8	82.8	66.9	73.0	75.9	67.2	61.2
70	88.2	81.2	90.3	88.9	N/A	N/A	74.0	N/A	67.2	74.1	87.1	83.0	66.8	72.1	76.0	66.8	61.1
72	87.9	81.5	90.7	88.8	N/A	N/A	74.3	N/A	67.2	74.0	87.2	83.5	67.3	71.5	76.2	66.5	61.4
74	87.6	81.8	90.6	88.5	N/A	N/A	73.7	N/A	67.1	78.2	87.4	83.7	66.7	70.8	76.3	65.9	61.6
76	86.9	81.8	90.9	88.5	N/A	N/A	73.8	N/A	67.0	79.4	87.7	83.7	67.2	69.6	76.1	65.0	61.5
78	83.3	81.7	90.4	88.1	N/A	N/A	73.6	N/A	66.5	79.4	87.4	83.7	55.9	67.0	75.8	63.7	61.2
80	83.8	81.7	90.5	87.8	N/A	N/A	72.3	N/A	66.6	79.6	87.6	84.2	48.6	71.6	76.0	63.1	62.1
82	84.1	81.3	90.7	87.4	N/A	N/A	65.3	N/A	66.5	79.5	87.7	84.4	49.6	70.4	75.9	61.9	61.8
84	84.6	81.3	90.4	86.9	N/A	N/A	61.3	N/A	66.2	79.5	85.4	84.7	50.2	69.6	76.2	61.3	61.7
86	85.0	81.0	90.8	86.4	N/A	N/A	61.6	N/A	66.1	79.6	85.1	84.9	51.1	68.9	76.1	60.0	62.2
88	85.7	80.7	90.5	85.7	N/A	N/A	62.4	N/A	65.7	79.5	84.7	85.2	51.7	69.6	76.1	58.8	61.7
90	80.9	81.1	90.4	85.2	N/A	N/A	62.8	N/A	65.7	79.7	84.1	85.6	52.6	68.6	76.2	58.0	61.8
92	81.5	80.2	90.3	84.3	N/A	N/A	63.8	N/A	65.1	79.6	83.5	85.7	53.5	69.7	76.0	55.9	62.0
94	82.2	79.8	89.9	83.3	N/A	N/A	64.2	N/A	64.7	79.7	82.7	85.9	54.2	68.2	76.1	0.0	61.6
96	82.8	79.3	89.7	82.0	N/A	N/A	64.1	N/A	64.4	79.6	81.6	85.9	54.8	67.4	76.1	0.0	61.5
98	83.6	79.5	88.9	79.4	N/A	N/A	65.6	N/A	63.8	79.4	80.3	86.0	56.0	63.8	76.3	0.0	61.0
100	83.9	78.6	86.9	75.0	N/A	N/A	65.7	N/A	62.2	81.3	75.8	85.9	57.0	64.1	75.9	0.0	23.9

4.1 7I5-10X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	84.4	80.5	90.4	83.0	N/A	N/A	92.6	N/A	N/A	89.8	75.5	88.4	79.3	70.2	86.6	0.0	N/A
4	86.2	83.3	90.3	84.4	N/A	N/A	92.5	N/A	N/A	89.0	79.0	88.6	79.3	66.6	85.8	0.0	N/A
6	88.0	83.8	90.9	85.0	N/A	N/A	92.7	N/A	N/A	89.4	80.8	88.7	79.2	64.7	85.5	0.0	N/A
8	88.5	84.2	91.3	85.7	N/A	N/A	92.6	N/A	N/A	89.6	82.1	88.1	79.8	66.1	85.2	0.0	N/A
10	88.6	84.8	90.9	86.1	N/A	N/A	92.9	N/A	N/A	90.2	83.9	88.2	80.7	67.9	85.1	82.0	N/A
12	88.6	83.8	91.0	85.8	N/A	N/A	93.1	N/A	N/A	90.2	84.2	88.1	80.4	68.9	84.4	81.9	N/A
14	90.4	83.9	90.9	86.1	N/A	N/A	92.9	N/A	N/A	90.1	84.9	87.6	80.3	78.2	84.0	82.1	N/A
16	90.5	83.3	91.1	84.0	N/A	N/A	93.1	N/A	N/A	90.3	85.2	87.4	80.6	75.9	83.6	82.5	N/A
18	90.1	82.9	90.7	84.5	N/A	N/A	93.8	N/A	N/A	90.3	85.0	87.0	80.0	75.5	83.5	82.4	N/A
20	90.2	82.5	90.6	85.6	N/A	N/A	95.2	N/A	N/A	90.6	85.5	86.7	80.6	76.4	83.2	82.8	N/A
22	90.3	82.3	90.6	86.1	N/A	N/A	95.6	N/A	N/A	90.5	85.5	86.4	80.4	76.2	82.5	82.2	N/A
24	90.1	82.3	90.4	86.4	N/A	N/A	95.8	N/A	N/A	90.4	85.4	86.2	85.4	79.5	82.2	82.7	N/A
26	91.7	82.6	90.9	87.0	N/A	N/A	96.3	N/A	N/A	90.5	85.7	85.9	86.2	86.5	81.8	83.0	N/A
28	91.4	82.3	90.6	87.0	N/A	N/A	96.3	N/A	N/A	86.0	85.4	85.0	86.5	86.0	81.4	83.2	N/A
30	91.4	82.5	90.7	87.3	N/A	N/A	96.4	N/A	N/A	86.4	85.4	84.1	86.3	86.3	81.2	83.3	N/A
32	91.6	82.8	94.7	89.0	N/A	N/A	96.5	N/A	N/A	86.6	86.4	84.1	86.9	85.7	80.7	83.6	N/A
34	91.5	82.5	94.1	88.6	N/A	N/A	96.4	N/A	N/A	86.3	86.7	82.5	86.5	85.2	85.3	86.4	N/A
36	91.3	82.5	94.3	88.7	N/A	N/A	96.4	N/A	N/A	86.3	86.3	81.9	86.5	84.7	85.6	86.3	N/A
38	91.2	82.2	93.7	88.7	N/A	N/A	96.3	N/A	N/A	86.1	85.8	80.2	86.3	85.8	85.2	86.5	N/A
40	91.5	82.7	93.9	88.8	N/A	N/A	96.6	N/A	N/A	86.5	86.6	90.0	86.9	86.0	85.7	86.9	N/A
42	91.3	82.2	93.7	88.7	N/A	N/A	96.5	N/A	N/A	86.1	86.1	89.6	86.7	85.3	85.4	87.2	N/A
44	91.4	82.5	93.7	89.0	N/A	N/A	96.5	N/A	N/A	86.5	86.7	90.1	86.9	85.4	85.7	87.9	N/A
46	91.3	81.8	93.7	88.7	N/A	N/A	96.5	N/A	N/A	86.4	87.0	89.7	87.0	85.0	85.6	87.8	N/A
48	91.4	81.7	93.2	86.0	N/A	N/A	96.6	N/A	N/A	86.7	90.8	89.6	87.0	84.1	85.8	87.7	N/A
50	91.2	81.6	92.6	85.7	N/A	N/A	96.4	N/A	N/A	86.5	91.3	89.5	86.8	85.5	85.5	87.6	N/A
52	91.4	81.9	93.4	85.7	N/A	N/A	96.4	N/A	N/A	86.7	91.8	89.3	87.1	85.0	85.9	87.1	N/A
54	91.3	81.8	93.9	85.7	N/A	N/A	96.5	N/A	N/A	86.6	91.9	89.4	87.1	84.3	85.8	86.7	N/A
56	91.4	81.4	94.3	85.3	N/A	N/A	96.3	N/A	N/A	86.3	91.7	89.2	87.1	83.6	85.5	85.7	N/A
58	91.5	82.0	94.3	85.7	N/A	N/A	96.5	N/A	N/A	86.7	92.0	89.3	87.1	83.8	85.9	85.7	N/A
60	91.5	81.9	94.2	85.6	N/A	N/A	96.3	N/A	N/A	86.6	91.9	89.2	86.9	83.3	85.8	85.4	N/A
62	91.5	81.8	94.6	85.3	N/A	N/A	96.4	N/A	N/A	86.7	92.3	89.1	87.0	84.3	86.0	84.7	N/A
64	91.6	81.8	94.6	85.5	N/A	N/A	96.3	N/A	N/A	86.7	92.4	87.4	87.2	84.0	85.9	84.4	N/A
66	91.7	81.6	95.0	85.5	N/A	N/A	96.3	N/A	N/A	86.7	92.3	88.1	86.9	83.7	85.8	83.7	N/A
68	91.6	81.5	94.8	85.6	N/A	N/A	96.2	N/A	N/A	86.6	92.6	88.1	86.9	83.2	85.7	81.7	N/A
70	91.5	81.5	94.5	85.8	N/A	N/A	96.1	N/A	N/A	86.6	92.5	88.5	86.7	83.2	83.0	81.5	N/A
72	91.7	81.5	92.8	85.6	N/A	N/A	96.1	N/A	N/A	86.6	93.0	89.1	86.8	82.6	83.2	80.8	N/A
74	91.6	81.4	92.7	85.3	N/A	N/A	96.0	N/A	N/A	90.2	92.9	89.3	86.2	83.6	83.3	80.7	N/A
76	91.4	81.0	92.9	85.1	N/A	N/A	95.6	N/A	N/A	90.1	93.0	89.5	85.5	82.6	83.5	79.4	N/A
78	90.9	81.0	92.6	85.1	N/A	N/A	95.3	N/A	N/A	90.3	93.2	89.6	81.1	82.3	83.9	77.9	N/A
80	91.0	80.8	92.6	85.0	N/A	N/A	94.7	N/A	N/A	90.4	93.3	89.7	76.8	81.9	84.3	77.4	N/A
82	91.2	80.5	92.9	84.7	N/A	N/A	93.5	N/A	N/A	90.2	93.4	89.8	77.1	81.5	84.4	76.2	N/A
84	91.2	81.3	92.8	84.5	N/A	N/A	92.0	N/A	N/A	90.2	92.5	89.8	77.6	81.3	84.8	75.8	N/A
86	91.6	81.5	93.1	84.4	N/A	N/A	92.0	N/A	N/A	90.2	92.1	90.0	78.0	81.7	85.2	74.6	N/A
88	91.6	81.4	92.9	84.0	N/A	N/A	92.0	N/A	N/A	90.0	91.5	90.1	78.1	81.0	85.4	73.6	N/A
90	90.6	81.6	92.7	83.7	N/A	N/A	92.1	N/A	N/A	89.8	90.9	90.0	78.2	80.9	85.7	72.7	N/A
92	90.9	81.2	92.9	83.7	N/A	N/A	92.3	N/A	N/A	89.8	90.4	90.2	78.7	80.4	85.9	71.1	N/A
94	91.1	81.2	92.7	83.5	N/A	N/A	92.6	N/A	N/A	90.0	89.7	90.3	79.1	80.3	86.4	0.0	N/A
96	91.2	80.5	92.6	83.0	N/A	N/A	92.7	N/A	N/A	89.7	88.3	90.4	79.3	80.1	86.7	0.0	N/A
98	91.3	78.8	92.2	82.4	N/A	N/A	93.1	N/A	N/A	89.8	87.2	90.2	79.8	72.6	86.9	0.0	N/A
100	91.3	76.8	91.4	81.9	N/A	N/A	93.4	N/A	N/A	90.6	83.4	90.2	80.4	70.2	87.0	0.0	N/A

4.18 I5-20X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	95.6	95.2	94.8	84.7	N/A	N/A	N/A	N/A	90.4	91.8	77.2	95.7	89.4	73.3	94.5	0.0	N/A
4	95.9	95.2	94.9	86.2	N/A	N/A	N/A	N/A	90.9	91.1	80.8	95.7	89.4	70.4	94.7	0.0	N/A
6	95.9	94.6	94.8	87.1	N/A	N/A	N/A	N/A	91.0	91.3	82.7	95.4	89.6	68.1	94.4	0.0	N/A
8	95.6	94.9	94.8	87.2	N/A	N/A	N/A	N/A	91.3	91.3	84.0	95.1	89.8	69.1	94.4	0.0	N/A
10	95.6	95.2	95.1	87.6	N/A	N/A	N/A	N/A	91.5	91.4	84.9	95.1	89.8	70.2	94.5	88.3	N/A
12	95.4	94.9	94.9	87.8	N/A	N/A	N/A	N/A	91.7	91.7	85.7	94.8	90.1	70.7	94.2	88.1	N/A
14	96.8	94.8	94.8	88.0	N/A	N/A	N/A	N/A	91.6	91.7	86.5	94.4	90.0	82.2	93.9	88.7	N/A
16	96.4	94.5	95.0	88.2	N/A	N/A	N/A	N/A	91.9	91.6	86.5	94.3	90.1	77.7	94.0	88.1	N/A
18	96.3	94.4	94.6	88.6	N/A	N/A	N/A	N/A	91.9	91.7	87.0	94.0	90.2	77.5	93.7	88.3	N/A
20	96.1	94.3	94.4	88.7	N/A	N/A	N/A	N/A	91.9	91.6	87.4	93.4	90.1	78.0	93.5	88.6	N/A
22	96.0	93.8	94.3	88.7	N/A	N/A	N/A	N/A	91.8	91.6	87.3	92.9	90.1	77.0	93.3	88.1	N/A
24	95.9	93.8	94.2	89.0	N/A	N/A	N/A	N/A	91.8	91.6	87.4	92.4	91.6	78.3	93.1	88.2	N/A
26	96.6	93.3	94.0	89.2	N/A	N/A	N/A	N/A	91.6	91.4	87.5	91.6	92.1	81.9	92.9	87.9	N/A
28	96.6	93.2	93.9	89.3	N/A	N/A	N/A	N/A	91.7	87.6	87.3	90.8	92.1	90.1	92.9	88.4	N/A
30	96.6	93.4	93.8	89.6	N/A	N/A	N/A	N/A	91.7	87.9	87.5	90.2	92.2	90.3	92.7	88.7	N/A
32	96.6	93.0	93.6	90.8	N/A	N/A	N/A	N/A	91.6	87.8	88.3	89.1	92.2	90.2	92.5	88.0	N/A
34	96.5	93.0	93.4	90.7	N/A	N/A	N/A	N/A	92.7	87.6	88.7	88.2	92.2	90.0	92.6	88.3	N/A
36	96.5	92.8	93.1	90.9	N/A	N/A	N/A	N/A	92.8	88.0	88.7	87.3	92.3	89.7	92.1	88.1	N/A
38	96.4	92.5	92.9	90.9	N/A	N/A	N/A	N/A	92.8	87.9	88.4	85.9	92.2	89.2	91.8	91.6	N/A
40	96.5	92.2	93.0	90.8	N/A	N/A	N/A	N/A	92.9	87.7	88.5	84.6	92.3	90.5	91.7	92.0	N/A
42	96.4	92.5	93.2	90.8	N/A	N/A	N/A	N/A	92.8	87.8	88.4	95.4	92.3	90.1	91.5	91.9	N/A
44	96.4	92.7	96.7	90.8	N/A	N/A	N/A	N/A	92.7	87.9	88.6	95.5	92.3	90.0	91.3	92.3	N/A
46	96.4	92.9	96.8	90.7	N/A	N/A	N/A	N/A	92.5	87.6	88.9	95.5	92.2	89.6	91.2	92.4	N/A
48	96.4	93.1	96.5	90.7	N/A	N/A	N/A	N/A	92.3	87.8	91.9	95.5	92.2	89.5	90.8	92.1	N/A
50	96.4	93.4	96.2	90.8	N/A	N/A	N/A	N/A	91.7	87.8	92.3	95.5	92.1	89.0	93.8	92.0	N/A
52	96.4	93.1	96.8	90.8	N/A	N/A	N/A	N/A	92.4	88.1	92.7	95.6	92.5	88.4	94.2	91.7	N/A
54	96.3	92.6	96.9	90.7	N/A	N/A	N/A	N/A	92.6	88.1	92.7	95.5	92.4	89.5	92.9	91.1	N/A
56	96.4	92.2	97.1	90.7	N/A	N/A	N/A	N/A	92.7	88.1	92.9	95.4	92.4	89.3	93.1	90.3	N/A
58	96.4	92.2	96.0	90.7	N/A	N/A	N/A	N/A	92.9	88.1	92.7	95.3	92.4	89.1	93.2	90.1	N/A
60	96.4	92.1	96.0	90.7	N/A	N/A	N/A	N/A	92.8	88.0	92.9	95.3	92.5	89.0	93.3	89.9	N/A
62	96.5	92.2	96.1	90.6	N/A	N/A	N/A	N/A	92.9	87.9	93.1	93.2	92.5	88.7	93.3	89.3	N/A
64	96.5	92.4	96.1	90.7	N/A	N/A	N/A	N/A	92.8	88.1	93.2	93.4	92.5	88.4	93.5	88.9	N/A
66	96.5	92.6	96.3	90.6	N/A	N/A	N/A	N/A	92.7	88.0	93.4	93.8	92.5	89.5	93.6	87.4	N/A
68	96.6	92.3	96.1	90.7	N/A	N/A	N/A	N/A	92.7	88.1	93.4	94.1	92.5	89.0	93.6	86.7	N/A
70	96.5	92.7	96.2	91.0	N/A	N/A	N/A	N/A	92.1	88.1	93.5	94.4	92.5	88.9	93.9	86.5	N/A
72	96.6	92.4	96.3	90.8	N/A	N/A	N/A	N/A	92.1	88.0	93.7	94.7	92.6	88.6	93.8	85.8	N/A
74	96.6	92.7	96.4	90.6	N/A	N/A	N/A	N/A	92.2	91.4	93.7	95.2	92.3	88.4	94.0	85.4	N/A
76	96.5	92.5	96.6	90.5	N/A	N/A	N/A	N/A	92.0	91.5	93.9	95.4	91.6	88.0	94.0	84.1	N/A
78	96.1	92.3	96.5	90.3	N/A	N/A	N/A	N/A	92.0	91.7	94.0	95.7	87.2	87.2	94.2	83.5	N/A
80	96.2	92.2	96.4	90.0	N/A	N/A	N/A	N/A	91.9	91.6	94.1	96.0	85.8	88.5	94.2	82.8	N/A
82	96.4	91.9	96.6	89.9	N/A	N/A	N/A	N/A	91.8	91.6	94.2	96.2	86.3	88.0	94.3	81.6	N/A
84	96.6	92.0	96.5	89.8	N/A	N/A	N/A	N/A	91.8	91.6	93.1	96.2	86.7	87.8	94.5	81.2	N/A
86	96.7	91.8	96.7	89.4	N/A	N/A	N/A	N/A	91.7	91.6	92.8	96.2	87.1	87.6	94.5	80.0	N/A
88	97.0	91.5	96.6	89.4	N/A	N/A	N/A	N/A	91.7	91.6	92.4	96.3	87.5	87.7	94.6	79.1	N/A
90	96.0	91.6	96.5	89.1	N/A	N/A	N/A	N/A	91.7	91.7	91.8	96.3	87.9	87.6	94.8	78.5	N/A
92	96.2	91.0	96.6	88.8	N/A	N/A	N/A	N/A	91.5	91.6	91.3	96.4	88.2	87.8	94.9	76.7	N/A
94	96.4	90.8	96.5	88.6	N/A	N/A	N/A	N/A	91.4	91.7	90.5	96.4	88.7	87.3	95.1	0.0	N/A
96	96.6	90.5	96.4	88.3	N/A	N/A	N/A	N/A	91.3	91.8	89.5	96.3	89.1	86.9	95.1	0.0	N/A
98	96.7	90.4	96.2	87.6	N/A	N/A	N/A	N/A	91.1	92.0	88.5	96.3	89.5	84.7	95.3	0.0	N/A
100	96.9	92.0	95.7	87.2	N/A	N/A	N/A	N/A	90.7	92.8	85.4	96.3	90.0	85.9	95.3	0.0	N/A

4.19 I5-30X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	96.5	96.4	96.4	84.3	N/A	N/A	N/A	N/A	92.8	92.0	77.5	96.4	89.9	73.2	95.6	0.0	N/A
4	96.6	96.3	96.5	86.2	N/A	N/A	N/A	N/A	93.3	91.4	81.4	96.3	90.2	70.5	96.1	0.0	N/A
6	96.4	95.7	96.5	86.9	N/A	N/A	N/A	N/A	93.4	91.5	82.9	96.0	90.2	67.9	95.9	0.0	N/A
8	96.3	95.9	96.5	87.1	N/A	N/A	N/A	N/A	93.8	91.6	84.3	95.8	90.4	68.9	95.8	0.0	N/A
10	95.9	96.0	96.4	87.3	N/A	N/A	N/A	N/A	93.8	91.6	85.1	95.5	90.3	69.9	95.8	88.5	N/A
12	95.8	95.7	96.3	87.7	N/A	N/A	N/A	N/A	93.7	91.7	85.7	95.1	90.4	70.2	95.5	88.2	N/A
14	97.1	95.7	96.3	88.0	N/A	N/A	N/A	N/A	93.9	91.9	86.7	94.9	90.6	82.0	95.3	88.8	N/A
16	96.9	95.3	96.3	88.2	N/A	N/A	N/A	N/A	93.9	91.7	86.5	94.7	90.6	77.7	95.3	88.3	N/A
18	96.8	95.2	96.1	88.4	N/A	N/A	N/A	N/A	93.8	91.7	87.1	94.1	90.5	77.5	95.0	88.4	N/A
20	96.5	95.3	96.0	88.6	N/A	N/A	N/A	N/A	93.9	91.6	87.6	93.4	90.6	77.8	94.9	88.6	N/A
22	96.5	94.9	95.8	88.7	N/A	N/A	N/A	N/A	93.7	91.7	87.5	92.7	90.6	76.9	94.8	88.3	N/A
24	96.3	94.7	95.6	89.0	N/A	N/A	N/A	N/A	93.6	91.6	87.7	91.8	91.8	78.3	94.5	88.4	N/A
26	96.9	94.4	95.7	89.1	N/A	N/A	N/A	N/A	93.7	91.4	87.7	91.2	92.3	81.9	94.4	88.2	N/A
28	96.9	94.3	95.6	89.3	N/A	N/A	N/A	N/A	93.6	87.8	87.6	90.5	92.3	90.3	94.4	88.7	N/A
30	96.9	94.3	95.5	89.4	N/A	N/A	N/A	N/A	93.5	87.9	87.7	89.6	92.4	90.5	94.2	88.8	N/A
32	96.9	94.0	95.3	90.7	N/A	N/A	N/A	N/A	93.4	88.0	88.7	88.6	92.3	90.3	94.1	88.4	N/A
34	96.9	94.1	95.1	90.7	N/A	N/A	N/A	N/A	94.0	87.8	89.0	87.7	92.4	90.3	94.0	88.5	N/A
36	96.9	93.8	94.8	90.7	N/A	N/A	N/A	N/A	93.9	88.0	88.9	86.6	92.4	90.0	93.6	88.2	N/A
38	96.7	93.6	94.5	90.7	N/A	N/A	N/A	N/A	93.8	88.0	88.7	85.4	92.4	89.4	93.3	91.7	N/A
40	96.8	93.5	94.5	90.7	N/A	N/A	N/A	N/A	93.6	87.8	88.8	84.1	92.3	90.6	93.2	92.1	N/A
42	96.9	93.1	94.6	90.7	N/A	N/A	N/A	N/A	93.6	88.0	88.6	82.7	92.4	90.4	93.0	92.0	N/A
44	96.8	92.9	96.7	90.7	N/A	N/A	N/A	N/A	93.5	88.0	88.9	95.6	92.4	90.2	92.9	92.4	N/A
46	96.8	93.8	97.9	90.7	N/A	N/A	N/A	N/A	93.2	87.9	89.3	95.9	92.4	90.0	92.6	92.4	N/A
48	96.8	94.1	97.7	91.2	N/A	N/A	N/A	N/A	93.0	88.2	92.3	95.8	92.5	89.9	92.4	92.2	N/A
50	96.8	94.5	97.5	91.2	N/A	N/A	N/A	N/A	92.3	88.1	92.6	95.8	92.4	89.5	92.1	92.1	N/A
52	96.8	94.2	97.9	91.1	N/A	N/A	N/A	N/A	93.0	88.2	93.0	95.9	92.6	88.7	94.3	91.6	N/A
54	96.8	93.7	98.1	90.9	N/A	N/A	N/A	N/A	93.3	88.2	93.0	95.8	92.5	89.9	94.4	91.3	N/A
56	96.8	93.1	98.1	91.0	N/A	N/A	N/A	N/A	93.5	88.3	93.1	95.6	92.6	89.9	94.6	90.4	N/A
58	96.8	93.3	97.3	91.1	N/A	N/A	N/A	N/A	93.9	88.3	93.0	95.5	92.6	89.7	94.7	90.3	N/A
60	96.8	93.4	97.4	90.9	N/A	N/A	N/A	N/A	93.8	88.1	93.1	92.8	92.7	89.5	94.8	89.9	N/A
62	96.8	93.5	97.5	91.0	N/A	N/A	N/A	N/A	94.0	88.2	93.5	93.2	92.8	89.3	94.9	89.5	N/A
64	96.9	93.6	97.5	90.9	N/A	N/A	N/A	N/A	94.1	88.3	93.4	93.3	92.7	88.9	95.0	89.2	N/A
66	96.9	93.7	97.6	90.9	N/A	N/A	N/A	N/A	94.2	88.2	93.6	93.6	92.7	90.0	95.2	87.4	N/A
68	96.9	93.6	97.6	91.0	N/A	N/A	N/A	N/A	94.2	88.3	93.7	94.0	92.7	89.7	95.2	86.9	N/A
70	96.9	93.8	97.6	91.3	N/A	N/A	N/A	N/A	94.1	88.2	93.8	94.3	92.7	89.5	95.3	86.8	N/A
72	97.0	93.5	97.7	91.1	N/A	N/A	N/A	N/A	94.1	88.2	94.0	94.5	92.7	89.3	95.4	86.0	N/A
74	97.0	93.7	97.8	90.9	N/A	N/A	N/A	N/A	94.1	91.4	94.0	95.0	92.6	89.1	95.6	85.7	N/A
76	96.8	93.5	97.9	90.8	N/A	N/A	N/A	N/A	94.1	91.6	94.2	95.3	91.9	88.6	95.6	84.2	N/A
78	96.4	93.3	97.8	90.6	N/A	N/A	N/A	N/A	94.1	91.8	94.2	95.5	87.4	87.9	95.7	83.6	N/A
80	96.6	93.2	97.9	90.4	N/A	N/A	N/A	N/A	94.0	91.7	94.3	95.9	86.2	89.2	95.8	83.0	N/A
82	96.7	92.8	97.9	90.2	N/A	N/A	N/A	N/A	94.1	91.7	94.6	96.2	86.8	88.8	95.9	81.8	N/A
84	96.9	92.9	97.9	90.0	N/A	N/A	N/A	N/A	94.1	91.7	93.3	96.6	87.1	88.6	96.0	81.4	N/A
86	97.0	92.7	98.0	89.7	N/A	N/A	N/A	N/A	94.0	91.7	93.0	96.6	87.5	88.4	96.0	80.1	N/A
88	97.3	92.4	98.0	89.6	N/A	N/A	N/A	N/A	94.0	91.7	92.6	96.7	87.9	88.6	96.2	79.4	N/A
90	96.3	92.5	97.9	89.3	N/A	N/A	N/A	N/A	94.0	91.8	92.0	96.7	88.3	88.3	96.3	78.7	N/A
92	96.5	91.8	98.0	89.1	N/A	N/A	N/A	N/A	93.9	91.8	91.6	96.8	88.7	88.6	96.4	77.0	N/A
94	96.7	91.7	97.9	88.8	N/A	N/A	N/A	N/A	93.8	91.9	90.8	96.8	89.1	88.2	96.5	0.0	N/A
96	96.9	91.4	97.9	88.5	N/A	N/A	N/A	N/A	93.7	92.0	89.9	96.8	89.6	87.9	96.6	0.0	N/A
98	97.0	91.4	97.7	87.8	N/A	N/A	N/A	N/A	93.5	92.2	88.8	96.8	90.0	86.8	96.7	0.0	N/A
100	97.2	93.1	97.4	87.4	N/A	N/A	N/A	N/A	93.1	93.0	85.9	96.7	90.5	86.8	96.7	0.0	N/A

4.20 I5-40X

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	96.6	96.9	96.6	84.0	N/A	N/A	N/A	N/A	93.0	92.2	77.5	96.3	90.0	72.6	96.5	0.0	N/A
4	96.6	96.6	96.5	85.9	N/A	N/A	N/A	N/A	93.5	91.5	81.3	96.1	90.2	70.1	96.5	0.0	N/A
6	96.6	96.2	96.5	86.6	N/A	N/A	N/A	N/A	93.7	91.6	83.0	95.9	90.4	67.8	96.4	0.0	N/A
8	96.4	96.4	96.5	86.8	N/A	N/A	N/A	N/A	93.9	91.8	84.3	95.6	90.4	68.7	96.3	0.0	N/A
10	96.1	96.6	96.4	87.0	N/A	N/A	N/A	N/A	94.0	91.7	85.1	95.3	90.4	69.6	96.3	88.5	N/A
12	95.9	96.1	96.1	87.4	N/A	N/A	N/A	N/A	93.9	91.8	85.9	95.0	90.5	69.9	95.9	88.3	N/A
14	97.2	96.3	96.2	87.6	N/A	N/A	N/A	N/A	94.0	91.9	86.6	94.8	90.6	82.0	95.9	88.9	N/A
16	96.9	95.9	96.1	87.9	N/A	N/A	N/A	N/A	94.0	91.8	86.6	94.4	90.5	77.7	95.7	88.4	N/A
18	96.8	95.8	96.0	88.0	N/A	N/A	N/A	N/A	93.9	91.8	87.1	93.9	90.5	77.5	95.4	88.4	N/A
20	96.6	95.9	95.9	88.4	N/A	N/A	N/A	N/A	93.9	91.8	87.7	93.2	90.6	77.8	95.4	88.7	N/A
22	96.5	95.6	95.7	88.6	N/A	N/A	N/A	N/A	93.8	91.8	87.6	92.4	90.6	77.0	95.2	88.4	N/A
24	96.4	95.6	95.6	88.8	N/A	N/A	N/A	N/A	93.9	91.8	87.8	91.7	91.8	78.2	95.1	88.5	N/A
26	97.0	95.0	95.4	89.0	N/A	N/A	N/A	N/A	93.9	91.5	87.7	91.1	92.4	81.9	94.9	88.3	N/A
28	97.0	95.0	95.3	89.1	N/A	N/A	N/A	N/A	93.8	88.1	87.6	90.3	92.4	90.4	94.8	88.8	N/A
30	97.0	95.0	95.3	89.2	N/A	N/A	N/A	N/A	93.7	88.1	87.7	89.4	92.4	90.6	94.7	88.9	N/A
32	97.0	94.8	95.1	90.5	N/A	N/A	N/A	N/A	93.5	88.1	88.6	88.5	92.4	90.4	94.5	88.4	N/A
34	97.1	94.8	95.0	90.5	N/A	N/A	N/A	N/A	94.0	88.1	89.0	87.5	92.4	90.4	94.4	88.6	N/A
36	97.0	94.5	94.5	90.5	N/A	N/A	N/A	N/A	93.9	88.2	88.8	86.4	92.3	90.1	94.1	88.3	N/A
38	96.9	94.3	94.1	90.6	N/A	N/A	N/A	N/A	93.7	88.2	88.7	85.2	92.4	89.4	93.9	91.7	N/A
40	96.9	94.3	94.2	90.4	N/A	N/A	N/A	N/A	93.6	88.0	88.8	83.9	92.3	90.5	93.7	92.0	N/A
42	97.0	93.8	93.6	90.5	N/A	N/A	N/A	N/A	93.6	88.1	88.6	82.5	92.4	90.4	93.4	92.0	N/A
44	97.0	94.0	93.7	90.4	N/A	N/A	N/A	N/A	93.5	88.1	89.0	95.4	92.4	90.2	93.3	92.5	N/A
46	96.9	93.8	94.2	90.5	N/A	N/A	N/A	N/A	93.2	88.1	89.3	95.7	92.4	90.1	92.8	92.5	N/A
48	96.9	93.5	97.0	91.1	N/A	N/A	N/A	N/A	92.9	88.4	92.3	95.7	92.4	90.0	92.3	92.2	N/A
50	96.9	95.1	97.8	91.1	N/A	N/A	N/A	N/A	92.2	88.3	92.6	95.7	92.4	89.6	87.1	92.2	N/A
52	97.0	95.0	98.3	91.1	N/A	N/A	N/A	N/A	93.0	88.4	93.0	95.8	92.6	88.8	94.2	91.6	N/A
54	96.9	94.7	97.5	90.9	N/A	N/A	N/A	N/A	93.3	88.4	92.9	95.7	92.6	90.1	94.7	91.3	N/A
56	96.9	94.4	97.6	91.0	N/A	N/A	N/A	N/A	93.6	88.5	93.1	95.5	92.6	90.0	95.0	90.5	N/A
58	96.9	94.3	97.6	91.1	N/A	N/A	N/A	N/A	93.8	88.6	93.0	95.4	92.6	89.8	95.2	90.4	N/A
60	97.0	94.4	97.6	91.0	N/A	N/A	N/A	N/A	93.9	88.5	93.2	92.8	92.7	89.6	95.3	90.0	N/A
62	97.0	94.4	97.8	91.0	N/A	N/A	N/A	N/A	94.0	88.5	93.5	93.1	92.8	89.4	95.5	89.5	N/A
64	97.0	94.5	97.8	91.0	N/A	N/A	N/A	N/A	94.2	88.4	93.4	93.2	92.7	89.0	95.5	89.2	N/A
66	97.0	94.6	97.9	91.0	N/A	N/A	N/A	N/A	94.3	88.4	93.6	93.6	92.7	90.1	95.6	87.5	N/A
68	96.9	94.4	97.9	91.0	N/A	N/A	N/A	N/A	94.3	88.5	93.7	93.9	92.7	89.8	95.7	86.9	N/A
70	97.0	94.5	97.9	91.3	N/A	N/A	N/A	N/A	94.2	88.5	93.8	94.2	92.7	89.7	95.8	86.8	N/A
72	97.0	94.2	97.9	91.2	N/A	N/A	N/A	N/A	94.2	88.4	93.9	94.5	92.7	89.5	95.9	86.1	N/A
74	97.1	94.5	98.0	90.9	N/A	N/A	N/A	N/A	94.3	91.5	94.1	94.9	92.5	89.2	96.0	85.8	N/A
76	96.9	94.2	98.0	90.8	N/A	N/A	N/A	N/A	94.2	91.7	94.2	95.2	91.9	88.8	96.0	84.4	N/A
78	96.5	94.0	98.0	90.7	N/A	N/A	N/A	N/A	94.3	91.9	94.3	95.5	87.5	88.1	96.2	83.7	N/A
80	96.7	93.9	98.1	90.4	N/A	N/A	N/A	N/A	94.3	91.8	94.4	95.9	86.3	89.4	96.3	83.1	N/A
82	96.8	93.5	98.1	90.3	N/A	N/A	N/A	N/A	94.3	91.8	94.5	96.1	86.8	89.1	96.3	81.9	N/A
84	96.9	93.5	98.1	90.1	N/A	N/A	N/A	N/A	94.3	91.8	93.3	96.5	87.1	88.8	96.4	81.5	N/A
86	97.1	93.2	98.2	89.8	N/A	N/A	N/A	N/A	94.2	91.8	92.9	96.5	87.6	88.6	96.4	80.2	N/A
88	97.3	92.9	98.2	89.6	N/A	N/A	N/A	N/A	94.2	91.9	92.6	96.6	88.0	88.9	96.6	79.5	N/A
90	96.4	92.9	98.2	89.3	N/A	N/A	N/A	N/A	94.2	91.9	92.0	96.6	88.4	88.5	96.7	78.7	N/A
92	96.6	92.2	98.2	89.1	N/A	N/A	N/A	N/A	94.1	91.9	91.5	96.7	88.7	88.7	96.7	77.0	N/A
94	96.8	92.0	98.2	88.9	N/A	N/A	N/A	N/A	94.1	92.1	90.8	96.8	89.2	88.4	96.8	0.0	N/A
96	97.0	91.7	98.2	88.6	N/A	N/A	N/A	N/A	93.9	92.2	89.9	96.7	89.6	88.1	96.9	0.0	N/A
98	97.1	91.9	98.1	87.9	N/A	N/A	N/A	N/A	93.7	92.3	88.9	96.7	90.0	87.3	97.0	0.0	N/A
100	97.3	93.6	97.8	87.4	N/A	N/A	N/A	N/A	93.3	93.2	85.9	96.7	90.6	87.0	97.0	0.0	N/A

4.21 I6

Difference	ALLPATHS-LG	BFC	BLESS	Blue	Coral	ECHO	Fiona	HITEC	Lighter	Musket	Quake	QuorUM	RACER	Reptile	SGA	SOAPec	Trowel
2	97.3	98.6	97.8	96.6	84.4	91.4	97.7	97.5	98.9	98.9	54.7	99.1	98.4	81.8	96.5	0.0	53.3
4	96.8	99.2	96.6	97.9	82.6	91.1	96.4	96.6	99.0	98.5	63.1	99.0	98.1	80.0	95.4	0.0	57.2
6	95.9	98.6	96.8	97.9	82.0	89.9	96.3	96.1	98.0	97.9	65.0	98.3	97.4	74.2	95.7	0.0	64.0
8	95.7	98.3	97.4	98.3	83.4	91.1	95.6	96.1	98.1	97.9	68.6	98.5	97.6	76.4	95.5	0.0	64.6
10	96.1	98.9	96.9	98.2	83.7	90.8	96.2	95.8	98.2	97.8	68.7	98.3	97.3	75.2	95.4	61.6	66.2
12	96.0	98.7	96.3	98.2	82.9	90.0	95.4	95.6	97.4	97.1	68.4	97.4	96.8	76.7	95.4	62.6	63.4
14	95.6	98.1	96.4	97.7	80.8	88.6	95.1	95.5	97.7	97.1	66.3	98.0	96.7	74.8	94.5	59.6	62.1
16	95.2	98.3	95.7	97.3	79.9	88.2	94.8	94.9	96.9	96.3	64.6	97.5	96.3	72.3	94.2	61.5	62.3
18	95.6	98.5	96.5	97.7	81.3	88.2	96.1	95.7	97.2	96.7	65.1	97.6	96.8	73.1	95.0	63.6	59.9
20	94.6	98.8	98.3	98.0	79.4	86.4	96.1	96.9	98.0	97.1	65.5	96.6	95.5	75.1	94.8	64.0	59.3
22	94.1	98.3	97.8	97.2	78.7	86.5	95.5	96.1	97.5	96.3	60.3	98.1	96.8	72.2	94.6	60.9	54.8
24	91.9	98.2	97.6	98.2	78.5	83.1	95.1	95.9	96.9	96.2	59.6	97.3	95.9	87.2	93.6	60.7	54.4
26	94.3	97.7	97.7	98.1	78.3	82.9	95.9	96.1	96.6	95.4	59.1	97.5	96.3	87.7	94.3	64.9	53.7
28	94.7	98.0	97.8	98.3	78.5	82.2	96.3	96.1	96.6	95.2	59.5	97.4	96.6	87.9	94.5	66.2	51.8
30	94.1	98.1	97.5	98.0	79.3	79.7	96.7	96.8	97.2	95.8	60.2	97.6	96.7	86.9	94.0	68.7	52.3
32	94.6	98.2	97.9	98.3	78.7	78.6	96.9	96.8	97.3	95.3	58.2	97.8	96.9	86.9	94.4	67.6	69.0
34	94.9	98.4	97.6	98.0	79.9	76.2	97.0	97.1	97.4	95.6	59.0	97.7	96.9	88.4	94.0	68.4	62.1
36	95.7	97.1	98.2	98.4	77.9	75.0	97.5	97.3	97.0	94.4	55.8	98.1	97.0	88.2	93.9	66.8	62.9
38	95.0	96.9	97.7	98.5	77.3	73.2	97.3	96.9	96.7	93.4	54.0	97.7	97.0	86.3	93.7	65.1	63.2
40	96.2	96.3	97.7	98.1	78.2	74.4	97.1	97.6	96.8	93.4	56.5	98.1	97.3	87.6	93.3	68.6	65.4
42	95.6	97.2	97.8	98.6	79.3	74.1	97.7	97.5	96.9	94.1	56.8	97.9	97.2	87.2	93.7	66.6	65.6
44	95.4	97.0	97.6	98.2	79.4	74.6	97.5	97.2	96.4	93.9	64.9	97.8	96.6	86.5	94.2	69.1	63.7
46	95.7	97.4	98.4	98.4	80.2	74.8	98.0	97.9	97.3	94.4	66.7	98.3	97.6	87.1	94.5	70.0	66.3
48	96.4	96.6	98.1	98.7	79.4	76.3	98.0	98.0	97.0	93.4	66.6	98.2	97.8	87.7	94.3	67.6	69.2
50	95.6	96.6	97.9	98.6	79.4	75.0	97.9	97.5	96.9	93.6	66.0	97.9	97.0	87.2	94.2	67.5	68.5
52	96.0	96.1	97.9	98.4	76.9	74.1	97.8	97.4	96.6	92.6	63.6	98.0	97.2	85.2	92.7	63.6	60.0
54	95.8	97.7	97.7	98.4	79.5	75.5	98.0	97.4	96.7	93.6	68.3	97.7	97.0	85.7	93.7	66.9	61.9
56	96.4	98.3	98.1	98.7	82.6	75.8	98.0	97.5	97.5	95.5	71.2	98.1	97.3	87.6	94.9	69.2	66.3
58	95.2	97.7	98.0	98.1	78.5	74.1	97.6	96.9	97.1	94.1	69.1	97.7	96.5	86.4	93.5	65.9	62.9
60	95.8	98.7	98.0	98.4	81.3	75.3	98.2	97.3	97.5	95.4	72.7	98.0	97.1	87.3	94.4	67.3	66.8
62	95.4	97.8	98.0	98.4	79.3	75.4	97.7	97.0	97.2	94.5	70.2	98.0	96.5	85.8	93.6	63.9	65.4
64	95.6	98.7	97.7	98.3	79.5	74.9	97.4	97.2	97.4	95.6	71.6	98.0	96.8	85.8	94.3	65.4	66.9
66	95.7	97.8	98.0	98.5	81.2	75.8	97.8	96.8	97.5	95.4	72.7	98.0	96.6	86.3	94.5	64.1	67.9
68	95.5	98.0	97.7	98.3	80.3	77.3	97.4	96.5	96.6	94.7	74.0	97.7	96.3	86.2	94.0	62.8	69.3
70	95.6	96.4	98.0	98.1	77.8	77.7	96.8	95.7	96.7	94.4	71.3	97.8	96.1	85.5	93.1	59.3	67.4
72	95.6	98.0	98.1	98.4	79.8	80.0	97.1	95.7	96.9	94.5	74.7	97.6	95.8	86.3	93.8	60.5	69.8
74	95.2	97.5	97.7	98.0	79.4	81.0	96.3	95.4	96.8	94.3	74.8	97.6	95.8	85.9	93.9	60.2	70.8
76	96.1	98.0	98.3	98.5	82.0	84.9	96.8	96.5	97.4	95.6	76.5	98.1	96.6	86.3	95.2	62.1	73.0
78	94.6	97.9	97.6	98.0	79.5	85.0	96.2	95.8	96.9	95.2	75.4	97.6	95.7	85.1	94.0	55.9	69.8
80	95.1	98.6	97.8	97.8	81.6	86.2	96.3	95.4	97.0	94.9	76.9	97.6	95.5	85.5	94.1	57.9	71.6
82	95.8	98.1	97.7	98.0	81.7	86.7	96.1	94.5	96.9	95.7	76.7	97.5	94.8	86.5	94.2	57.5	72.9
84	97.2	98.5	98.2	98.4	84.9	89.4	97.0	95.5	97.4	96.7	81.4	98.2	95.9	87.6	95.6	61.1	77.4
86	97.3	98.5	98.2	98.5	85.4	90.2	96.4	95.5	97.3	96.3	82.8	98.1	95.9	87.2	95.8	58.3	78.1
88	97.1	98.7	98.4	98.5	86.2	90.0	96.8	96.1	97.4	96.6	82.8	98.2	96.2	87.0	95.9	58.4	77.2
90	96.7	98.7	98.1	98.6	85.3	90.4	96.4	95.7	97.2	96.8	82.0	98.0	96.2	87.1	95.6	56.6	78.0
92	97.7	99.0	98.7	98.9	89.1	92.3	97.7	97.0	98.0	97.8	86.2	98.8	97.1	90.4	97.0	64.1	81.2
94	97.2	98.6	98.1	98.5	85.2	90.3	97.0	95.7	97.6	97.2	80.6	98.4	96.0	87.3	95.8	0.0	78.1
96	97.3	98.5	98.6	98.6	85.9	90.8	97.4	95.8	98.1	97.9	79.9	99.1	96.3	86.7	95.8	0.0	77.5
98	98.0	98.7	98.7	98.7	87.0	91.8	98.1	96.6	98.1	98.1	80.5	99.0	97.1	87.5	96.6	0.0	76.2
100	97.6	98.3	98.2	98.4	87.5	91.4	97.8	96.4	97.9	98.2	74.2	98.7	97.2	84.0	96.3	0.0	51.7

5. Alignment

5.1 I1-10X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	52.50	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	93.91	99.95
BFC	94.02	99.99
BLESS	98.03	100.00
Blue	94.97	99.92
Coral	93.41	98.77
ECHO	87.87	99.98
Fiona	96.74	99.96
HiTEC	90.30	99.98
Lighter	N/A	N/A
Musket	97.90	100.00
Quake	98.14	100.00
QuorUM	95.32	99.99
RACER	86.81	99.91
Reptile	93.43	99.99
SGA	96.65	100.00
SOAPec	79.37	99.99
Trowel	55.51	100.00

5.2 I1-20X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	52.38	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	98.16	99.97
BFC	97.93	100.00
BLESS	99.50	100.00
Blue	98.98	99.91
Coral	93.03	98.75
ECHO	90.60	99.99
Fiona	97.93	99.97
HiTEC	96.82	99.99
Lighter	96.69	99.99
Musket	98.24	100.00
Quake	99.21	100.00
QuorUM	99.23	100.00
RACER	95.23	99.95
Reptile	96.89	99.99
SGA	99.23	100.00
SOAPec	81.87	100.00
Trowel	80.56	100.00

5.3 I1-30X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	52.35	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	98.78	99.98
BFC	98.30	100.00
BLESS	99.79	100.00
Blue	99.48	99.91
Coral	92.69	98.71
ECHO	88.68	99.99
Fiona	98.09	99.97
HiTEC	98.30	100.00
Lighter	98.83	100.00
Musket	99.44	100.00
Quake	99.48	100.00
QuorUM	99.78	100.00
RACER	97.62	99.96
Reptile	97.49	99.99
SGA	99.50	100.00
SOAPec	82.09	100.00
Trowel	85.27	100.00

5.4 I1-40X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	52.52	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	99.07	99.98
BFC	98.40	100.00
BLESS	99.83	100.00
Blue	99.64	99.90
Coral	92.13	98.72
ECHO	87.46	99.99
Fiona	98.28	99.96
HiTEC	98.78	99.99
Lighter	99.30	100.00
Musket	99.49	100.00
Quake	99.57	100.00
QuorUM	99.88	100.00
RACER	98.51	99.96
Reptile	97.77	99.99
SGA	99.57	100.00
SOAPec	82.19	100.00
Trowel	89.29	100.00

5.5 I2-10X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	50.95	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	95.24	99.87
BFC	94.91	99.97
BLESS	98.60	99.99
Blue	96.87	99.91
Coral	94.52	98.66
ECHO	92.19	99.94
Fiona	97.12	99.93
HiTEC	92.23	99.90
Lighter	N/A	N/A
Musket	98.32	100.00
Quake	98.57	100.00
QuorUM	95.94	99.95
RACER	88.76	99.78
Reptile	96.71	99.96
SGA	97.94	100.00
SOAPec	79.23	99.98
Trowel	53.08	99.99

5.6 I2-20X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	50.82	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	98.21	99.94
BFC	97.98	99.99
BLESS	99.71	100.00
Blue	99.26	99.92
Coral	94.01	98.53
ECHO	94.92	99.97
Fiona	98.27	99.94
HiTEC	97.27	99.98
Lighter	97.73	99.99
Musket	99.39	100.00
Quake	99.46	100.00
QuorUM	99.55	99.99
RACER	95.48	99.93
Reptile	97.53	99.97
SGA	99.41	100.00
SOAPec	81.09	100.00
Trowel	76.68	99.99

5.7 I2-30X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	50.85	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	98.75	99.96
BFC	98.16	100.00
BLESS	99.82	99.99
Blue	99.59	99.92
Coral	93.12	98.54
ECHO	93.89	99.98
Fiona	98.52	99.94
HiTEC	98.87	99.99
Lighter	99.26	99.99
Musket	99.48	100.00
Quake	99.58	100.00
QuorUM	99.87	100.00
RACER	98.20	99.94
Reptile	97.97	99.97
SGA	99.57	100.00
SOAPec	81.21	100.00
Trowel	85.07	99.99

5.8 I2-40X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	50.86	100.00
Error-Free	100.00	100.00
ALLPATHS-LG	99.07	99.97
BFC	98.23	100.00
BLESS	99.85	99.99
Blue	99.68	99.92
Coral	92.52	98.52
ECHO	93.33	99.99
Fiona	98.65	99.94
HiTEC	99.30	99.99
Lighter	99.47	100.00
Musket	99.50	100.00
Quake	99.58	100.00
QuorUM	99.90	100.00
RACER	99.29	99.96
Reptile	98.25	99.97
SGA	99.60	100.00
SOAPec	81.23	100.00
Trowel	89.92	100.00

5.9 I3-10X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.16	99.99
Error-Free	100.00	100.00
ALLPATHS-LG	93.65	99.76
BFC	92.03	99.96
BLESS	96.89	99.98
Blue	92.07	99.66
Coral	79.30	98.11
ECHO	82.74	99.76
Fiona	93.86	99.74
HiTEC	86.89	99.75
Lighter	N/A	N/A
Musket	95.77	99.97
Quake	96.99	99.98
QuorUM	92.86	99.86
RACER	79.55	99.47
Reptile	86.90	99.81
SGA	94.81	99.98
SOAPec	77.68	99.95
Trowel	67.97	99.92

5.10 I3-20X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.13	99.99
Error-Free	100.00	100.00
ALLPATHS-LG	97.45	99.89
BFC	96.27	99.98
BLESS	98.64	99.98
Blue	95.48	99.68
Coral	79.95	97.93
ECHO	89.11	99.90
Fiona	95.06	99.76
HiTEC	94.89	99.92
Lighter	95.54	99.95
Musket	97.47	99.98
Quake	98.14	99.99
QuorUM	97.99	99.96
RACER	92.40	99.85
Reptile	90.97	99.84
SGA	97.68	99.99
SOAPec	80.31	99.98
Trowel	79.19	99.97

5.11 I3-30X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.13	99.99
Error-Free	100.00	100.00
ALLPATHS-LG	98.19	99.92
BFC	96.92	99.98
BLESS	99.08	99.98
Blue	96.00	99.66
Coral	79.72	97.89
ECHO	89.23	99.91
Fiona	95.34	99.76
HiTEC	96.61	99.95
Lighter	97.67	99.98
Musket	97.77	99.98
Quake	98.35	99.99
QuorUM	98.71	99.98
RACER	95.41	99.91
Reptile	91.66	99.85
SGA	98.25	99.99
SOAPec	80.59	99.99
Trowel	86.19	99.99

5.12 I3-40X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.16	99.99
Error-Free	100.00	100.00
ALLPATHS-LG	98.51	99.93
BFC	97.41	99.98
BLESS	99.23	99.98
Blue	96.07	99.66
Coral	79.26	97.84
ECHO	88.52	99.94
Fiona	95.28	99.76
HiTEC	N/A	N/A
Lighter	98.13	99.99
Musket	97.87	99.98
Quake	98.41	99.99
QuorUM	98.78	99.98
RACER	96.40	99.94
Reptile	92.00	99.86
SGA	98.53	99.99
SOAPec	80.67	99.99
Trowel	89.74	99.99

5.13 I4-10X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.28	99.54
Error-Free	100.00	99.98
ALLPATHS-LG	89.42	96.85
BFC	84.82	96.85
BLESS	88.49	98.51
Blue	83.71	91.58
Coral	51.28	99.54
ECHO	N/A	N/A
Fiona	70.72	95.47
HiTEC	79.07	96.50
Lighter	N/A	N/A
Musket	82.57	97.13
Quake	87.07	97.54
QuorUM	87.70	96.75
RACER	75.94	95.87
Reptile	77.27	95.92
SGA	83.39	97.65
SOAPec	70.85	97.99
Trowel	77.48	98.83

5.14 I4-20X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.25	99.54
Error-Free	100.00	99.99
ALLPATHS-LG	90.15	97.71
BFC	88.18	97.13
BLESS	91.31	98.80
Blue	83.67	92.72
Coral	51.25	99.54
ECHO	N/A	N/A
Fiona	70.56	94.88
HiTEC	N/A	N/A
Lighter	82.76	99.02
Musket	83.58	98.15
Quake	87.71	98.52
QuorUM	87.40	98.46
RACER	75.99	98.71
Reptile	78.46	96.63
SGA	85.33	98.48
SOAPec	71.33	98.91
Trowel	76.39	99.15

5.15 I4-30X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.27	99.54
Error-Free	100.00	99.99
ALLPATHS-LG	89.66	97.67
BFC	88.71	98.01
BLESS	92.31	98.92
Blue	84.67	92.46
Coral	51.27	99.54
ECHO	N/A	N/A
Fiona	70.26	94.59
HiTEC	N/A	N/A
Lighter	81.22	99.30
Musket	83.89	98.43
Quake	87.90	98.81
QuorUM	87.01	98.65
RACER	75.09	99.14
Reptile	78.78	96.95
SGA	86.22	98.74
SOAPec	71.75	98.93
Trowel	75.90	99.14

5.16 I4-40X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.26	99.54
Error-Free	100.00	99.99
ALLPATHS-LG	88.76	97.52
BFC	89.33	98.14
BLESS	92.80	99.08
Blue	84.35	92.67
Coral	51.26	99.54
ECHO	N/A	N/A
Fiona	70.46	94.31
HiTEC	N/A	N/A
Lighter	79.71	99.33
Musket	84.32	98.33
Quake	88.17	98.76
QuorUM	86.54	98.74
RACER	74.16	99.24
Reptile	79.47	97.22
SGA	86.72	98.87
SOAPec	71.77	99.14
Trowel	75.71	99.18

5.17 I5-10X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.11	99.98
Error-Free	100.00	99.99
ALLPATHS-LG	92.28	99.76
BFC	87.69	99.97
BLESS	94.94	99.98
Blue	89.17	99.74
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	92.56	99.84
HiTEC	N/A	N/A
Lighter	N/A	N/A
Musket	92.31	99.98
Quake	93.46	99.98
QuorUM	91.12	99.93
RACER	76.07	99.66
Reptile	84.23	99.90
SGA	91.07	99.98
SOAPec	75.86	99.96
Trowel	N/A	N/A

5.18 I5-20X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.13	99.98
Error-Free	100.00	99.99
ALLPATHS-LG	95.93	99.87
BFC	94.94	99.97
BLESS	97.45	99.98
Blue	92.77	99.75
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	N/A	N/A
HiTEC	N/A	N/A
Lighter	93.42	99.97
Musket	93.60	99.98
Quake	94.45	99.98
QuorUM	96.21	99.97
RACER	89.10	99.91
Reptile	88.64	99.91
SGA	96.43	99.98
SOAPec	79.02	99.98
Trowel	N/A	N/A

5.19 I5-30X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.12	99.98
Error-Free	100.00	99.99
ALLPATHS-LG	96.57	99.90
BFC	96.20	99.98
BLESS	98.35	99.98
Blue	93.04	99.74
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	N/A	N/A
HiTEC	N/A	N/A
Lighter	95.76	99.98
Musket	93.78	99.98
Quake	94.63	99.98
QuorUM	97.17	99.98
RACER	91.91	99.94
Reptile	89.47	99.92
SGA	97.37	99.99
SOAPec	79.22	99.99
Trowel	N/A	N/A

5.20 I5-40X

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	51.12	99.98
Error-Free	100.00	99.99
ALLPATHS-LG	96.88	99.91
BFC	96.65	99.98
BLESS	98.59	99.98
Blue	93.08	99.73
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	N/A	N/A
HiTEC	N/A	N/A
Lighter	96.13	99.98
Musket	93.86	99.98
Quake	94.71	99.98
QuorUM	97.29	99.98
RACER	92.95	99.95
Reptile	89.65	99.92
SGA	97.61	99.98
SOAPec	79.27	99.99
Trowel	N/A	N/A

5.21 I6

Software	Aligned Reads / Total Reads (%)	Correctly Aligned Reads / Aligned Reads (%)
Original	81.07	100.00
Error-Free	N/A	N/A
ALLPATHS-LG	98.68	99.99
BFC	98.39	100.00
BLESS	98.65	100.00
Blue	98.78	99.94
Coral	95.96	99.57
ECHO	94.98	100.00
Fiona	98.17	99.99
HiTEC	97.83	100.00
Lighter	98.22	100.00
Musket	97.79	100.00
Quake	95.82	100.00
QuorUM	98.64	99.99
RACER	98.36	99.99
Reptile	96.69	99.99
SGA	97.95	100.00
SOAPec	90.15	100.00
Trowel	92.49	100.00

5.22 P1

Data		Software	Aligned Reads / Total Reads (%)	Exactly Aligned Reads / Total Reads (%)
N/A		Original	95.6	0.0
P1-10X	LoRDEC	Trimmed	96.7	61.4
		Untrimmed	96.9	0.1
	LSC	Trimmed	97.9	0.1
		Untrimmed	97.9	0.0
	PBcR	Trimmed	99.6	46.4
		Untrimmed	N/A	N/A
	Proovread	Trimmed	98.7	35.1
		Untrimmed	97.8	0.1
P1-20X	LoRDEC	Trimmed	98.4	62.5
		Untrimmed	96.8	2.0
	LSC	Trimmed	97.9	0.1
		Untrimmed	97.9	0.0
	PBcR	Trimmed	99.7	57.0
		Untrimmed	N/A	N/A
	Proovread	Trimmed	98.9	44.9
		Untrimmed	98.0	1.8
P1-30X	LoRDEC	Trimmed	98.2	55.5
		Untrimmed	96.6	4.1
	LSC	Trimmed	97.9	0.2
		Untrimmed	97.9	0.0
	PBcR	Trimmed	99.7	59.3
		Untrimmed	N/A	N/A
	Proovread	Trimmed	98.6	50.3
		Untrimmed	97.9	3.9
P1-40X	LoRDEC	Trimmed	98.1	44.8
		Untrimmed	96.6	4.3
	LSC	Trimmed	97.9	0.3
		Untrimmed	97.9	0.0
	PBcR	Trimmed	99.7	57.5
		Untrimmed	N/A	N/A
	Proovread	Trimmed	98.6	52.1
		Untrimmed	97.8	4.3

5.23 P2

Data		Software	Aligned Reads / Total Reads (%)	Exactly Aligned Reads / Total Reads (%)
N/A		Original	98.4	0.0
P2-10X	LoRDEC	Trimmed	100.0	45.4
		Untrimmed	99.5	0.5
	LSC	Trimmed	N/A	N/A
		Untrimmed	N/A	N/A
	PBcR	Trimmed	100.0	38.7
		Untrimmed	N/A	N/A
	Proovread	Trimmed	100.0	46.2
		Untrimmed	100.0	3.1
P2-20X	LoRDEC	Trimmed	100.0	43.7
		Untrimmed	99.5	1.2
	LSC	Trimmed	N/A	N/A
		Untrimmed	N/A	N/A
	PBcR	Trimmed	100.0	32.3
		Untrimmed	N/A	N/A
	Proovread	Trimmed	100.0	49.2
		Untrimmed	100.0	9.7
P2-30X	LoRDEC	Trimmed	100.0	42.7
		Untrimmed	99.5	1.4
	LSC	Trimmed	N/A	N/A
		Untrimmed	N/A	N/A
	PBcR	Trimmed	100.0	28.7
		Untrimmed	N/A	N/A
	Proovread	Trimmed	100.0	50.2
		Untrimmed	100.0	12.9
P2-40X	LoRDEC	Trimmed	100.0	41.5
		Untrimmed	99.5	1.4
	LSC	Trimmed	N/A	N/A
		Untrimmed	N/A	N/A
	PBcR	Trimmed	100.0	26.6
		Untrimmed	N/A	N/A
	Proovread	Trimmed	100.0	50.6
		Untrimmed	100.0	14.5
P2-40X-EF	LoRDEC	Trimmed	100.0	43.0
		Untrimmed	99.4	2.0
	LSC	Trimmed	N/A	N/A
		Untrimmed	N/A	N/A
	PBcR	Trimmed	100.0	27.5
		Untrimmed	N/A	N/A
	Proovread	Trimmed	100.0	51.2
		Untrimmed	100.0	15.3

6. Memory Usage and Runtime

6.1 I1-10X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	246	1
BFC	351	1
BLESS	N/A	1
Blue	248	1
Coral	20,321	1
ECHO	3,086	23
Fiona	1,024	2
HiTEC	989	5
Lighter	N/A	N/A
Musket	N/A	1
Quake	2,071	5
QuorUM	N/A	1
RACER	243	1
Reptile	884	4
SGA	36	1
SOAPec	4,983	1
Trowel	4,242	1

6.2 I1-20X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	446	3
BFC	476	1
BLESS	221	1
Blue	353	1
Coral	19,637	3
ECHO	3,871	62
Fiona	1,035	3
HiTEC	1,836	4
Lighter	47	1
Musket	160	1
Quake	2,075	4
QuorUM	1	1
RACER	260	1
Reptile	1,348	7
SGA	87	1
SOAPec	4,975	1
Trowel	4,342	1

6.3 I1-30X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	692	4
BFC	N/A	1
BLESS	N/A	1
Blue	579	1
Coral	19,877	5
ECHO	5,699	118
Fiona	1,563	4
HiTEC	2,688	6
Lighter	N/A	1
Musket	176	1
Quake	2,076	4
QuorUM	1,125	1
RACER	N/A	1
Reptile	2,035	10
SGA	99	2
SOAPec	325	4
Trowel	5,135	1

6.4 I1-40X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	862	5
BFC	984	1
BLESS	463	1
Blue	746	2
Coral	18,173	7
ECHO	7,582	188
Fiona	1,602	4
HiTEC	3,537	8
Lighter	37	1
Musket	249	1
Quake	8,232	6
QuorUM	N/A	1
RACER	528	1
Reptile	1,857	15
SGA	110	2
SOAPec	4,981	2
Trowel	6,053	2

6.5 I2-10X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	191	2
BFC	N/A	1
BLESS	N/A	1
Blue	233	1
Coral	18,862	1
ECHO	3,627	27
Fiona	794	2
HiTEC	1,180	5
Lighter	N/A	N/A
Musket	N/A	1
Quake	537	3
QuorUM	857	1
RACER	279	1
Reptile	606	4
SGA	82	1
SOAPec	4,977	1
Trowel	4,250	1

6.6 I2-20X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	507	3
BFC	N/A	1
BLESS	189	1
Blue	247	1
Coral	20,520	3
ECHO	4,342	77
Fiona	1,090	3
HiTEC	2,171	5
Lighter	35	1
Musket	212	1
Quake	541	7
QuorUM	N/A	1
RACER	299	1
Reptile	1,977	9
SGA	91	1
SOAPec	273	1
Trowel	4,763	1

6.7 I2-30X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	790	4
BFC	712	1
BLESS	308	1
Blue	644	2
Coral	20,247	5
ECHO	6,323	145
Fiona	1,458	4
HiTEC	3,172	7
Lighter	40	1
Musket	241	1
Quake	2,104	7
QuorUM	1,258	1
RACER	322	1
Reptile	1,691	13
SGA	108	2
SOAPec	5	2
Trowel	5,031	1

6.8 I2-40X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	980	5
BFC	N/A	1
BLESS	158	1
Blue	541	2
Coral	21,647	7
ECHO	8,396	236
Fiona	1,815	5
HiTEC	4,173	10
Lighter	87	1
Musket	291	1
Quake	617	6
QuorUM	1,193	1
RACER	640	1
Reptile	2,100	17
SGA	118	2
SOAPec	4,983	2
Trowel	6,404	2

6.9 I3-10X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	1,498	7
BFC	1,503	1
BLESS	266	1
Blue	3,055	4
Coral	21,866	9
ECHO	10,430	259
Fiona	2,229	6
HiTEC	6,155	38
Lighter	N/A	N/A
Musket	520	2
Quake	8,230	7
QuorUM	1,191	1
RACER	1,535	2
Reptile	3,302	28
SGA	162	3
SOAPec	4,977	3
Trowel	5,115	2

6.10 I3-20X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	2,835	13
BFC	1,733	2
BLESS	236	2
Blue	2,712	4
Coral	N/A	N/A
ECHO	21,232	690
Fiona	4,002	11
HiTEC	11,749	59
Lighter	198	2
Musket	657	3
Quake	8,237	10
QuorUM	1,722	2
RACER	1,654	3
Reptile	3,336	58
SGA	238	7
SOAPec	4,984	6
Trowel	6,852	3

6.11 I3-30X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	3,979	21
BFC	1,690	2
BLESS	1,945	2
Blue	3,606	6
Coral	N/A	N/A
ECHO	31,117	1,365
Fiona	5,964	16
HiTEC	17,263	91
Lighter	198	2
Musket	849	4
Quake	8,244	21
QuorUM	1,789	2
RACER	1,774	4
Reptile	3,752	82
SGA	324	10
SOAPec	4,985	7
Trowel	12,145	5

6.12 I3-40X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	5,700	27
BFC	3,184	3
BLESS	565	2
Blue	3,265	7
Coral	N/A	N/A
ECHO	40,439	2,342
Fiona	7,914	22
HiTEC	N/A	N/A
Lighter	198	2
Musket	980	4
Quake	8,254	20
QuorUM	1,852	3
RACER	1,896	5
Reptile	3,718	109
SGA	410	14
SOAPec	4,984	9
Trowel	12,714	6

6.13 I4-10X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	4,000	19
BFC	4,391	3
BLESS	2,329	2
Blue	2,985	5
Coral	20,209	24
ECHO	N/A	N/A
Fiona	5,835	18
HiTEC	16,225	89
Lighter	N/A	N/A
Musket	374	4
Quake	8,240	13
QuorUM	2,318	2
RACER	4,714	3
Reptile	2,533	32
SGA	296	11
SOAPec	4,982	6
Trowel	7,670	3

6.14 I4-20X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	7,911	34
BFC	3,946	5
BLESS	3,819	3
Blue	3,635	8
Coral	20,637	35
ECHO	N/A	N/A
Fiona	13,560	41
HiTEC	N/A	N/A
Lighter	462	3
Musket	588	7
Quake	8,247	23
QuorUM	2,639	4
RACER	5,069	6
Reptile	3,178	66
SGA	574	22
SOAPec	4,979	10
Trowel	8,412	6

6.15 I4-30X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	9,247	57
BFC	4,881	7
BLESS	3,814	5
Blue	4,733	11
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	20,203	66
HiTEC	N/A	N/A
Lighter	464	3
Musket	821	9
Quake	8,270	33
QuorUM	2,641	5
RACER	5,425	9
Reptile	3,400	108
SGA	841	33
SOAPec	4,984	14
Trowel	12,096	8

6.16 I4-40X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	10,638	78
BFC	5,104	9
BLESS	3,819	6
Blue	5,015	14
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	22,085	122
HiTEC	N/A	N/A
Lighter	462	4
Musket	989	13
Quake	8,296	41
QuorUM	2,645	7
RACER	5,784	11
Reptile	4,172	137
SGA	1,194	47
SOAPec	4,979	18
Trowel	13,339	10

6.17 I5-10X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	8,583	54
BFC	9,379	6
BLESS	2,806	6
Blue	18,989	22
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	16,152	49
HiTEC	N/A	N/A
Lighter	N/A	N/A
Musket	3,217	9
Quake	11,252	44
QuorUM	7,591	6
RACER	11,688	10
Reptile	9,833	346
SGA	1,105	28
SOAPec	4,987	25
Trowel	N/A	N/A

6.18 I5-20X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	12,287	122
BFC	10,753	12
BLESS	3,813	9
Blue	20,286	29
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	N/A	N/A
HiTEC	N/A	N/A
Lighter	1,107	9
Musket	4,215	19
Quake	13,760	74
QuorUM	8,163	10
RACER	12,623	17
Reptile	13,016	815
SGA	1,874	61
SOAPec	4,985	42
Trowel	N/A	N/A

6.19 I5-30X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	15,244	221
BFC	10,824	16
BLESS	3,823	13
Blue	20,389	36
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	N/A	N/A
HiTEC	N/A	N/A
Lighter	1,107	11
Musket	5,655	27
Quake	21,510	121
QuorUM	8,686	16
RACER	13,555	26
Reptile	15,601	1,240
SGA	2,540	91
SOAPec	9,704	57
Trowel	N/A	N/A

6.20 I5-40X

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	18,424	435
BFC	10,889	21
BLESS	3,825	15
Blue	20,398	46
Coral	N/A	N/A
ECHO	N/A	N/A
Fiona	N/A	N/A
HiTEC	N/A	N/A
Lighter	1,109	13
Musket	6,647	36
Quake	21,643	143
QuorUM	8,686	22
RACER	14,490	35
Reptile	17,422	1,711
SGA	3,508	125
SOAPec	9,708	71
Trowel	N/A	N/A

6.21 I6

Software	Memory (MB)	Runtime (min)
ALLPATHS-LG	980	6
BFC	991	1
BLESS	296	1
Blue	379	2
Coral	21,210	6
ECHO	8,545	221
Fiona	1,789	5
HiTEC	4,170	24
Lighter	39	1
Musket	242	1
Quake	378	6
QuorUM	N/A	1
RACER	359	1
Reptile	2,252	17
SGA	116	2
SOAPec	4,977	2
Trowel	2,573	2

6.22 P1

Data	Software	Memory (MB)	Runtime (min)
P1-10X	LoRDEC	452	8
	LSC	2,165	51
	PBcR	947	10
	Proovread	4,019	73
P1-20X	LoRDEC	607	9
	LSC	3,410	61
	PBcR	1,176	18
	Proovread	3,853	117
P1-30X	LoRDEC	771	10
	LSC	4,474	89
	PBcR	781	29
	Proovread	3,942	147
P1-40X	LoRDEC	839	12
	LSC	6,109	120
	PBcR	3,175	39
	Proovread	3,950	164

6.23 P2

Data	Software	Memory (MB)	Runtime (min)
P2-10	LoRDEC	616	54
	LSC	N/A	N/A
	PBcR	3,868	80
	Proovread	3,552	327
P2-20	LoRDEC	748	54
	LSC	N/A	N/A
	PBcR	10,706	321
	Proovread	3,882	549
P2-30	LoRDEC	425	54
	LSC	N/A	N/A
	PBcR	12,434	703
	Proovread	4,188	671
P2-40	LoRDEC	433	53
	LSC	N/A	N/A
	PBcR	14,260	1,174
	Proovread	4,202	709
P2-40-EF	LoRDEC	426	53
	LSC	N/A	N/A
	PBcR	15,141	1,264
	Proovread	4,011	672

ERROR LOCATION FILE FORMAT

Each line of an error location file F_L contains nine fields as shown in Figure S. The meaning of each field is explained in the following sections.

1. Read ID

The name of the read. A read and its corresponding pair may have the same name if generated from a SAM file. This is because some alignment tools strip the identifiers such as "/1" and "/2" from read names when they generate an output SAM file. In this case, the forward read in a pair is the first one and the reverse read is the second one.

2. Ploidy ID

If reads are generated using two reference sequences for modeling a diploid genome, each of the two reference sequences has the identifier 1 and 2. This field shows where the read comes from. If all reads are generated from one reference sequence, all the reads should have 1 in this field.

3. Chromosome Name

A reference sequence fasta file may have multiple chromosome sequences, and this field designate one of the chromosome where the read originates.

4. Strand

The strand where the read originates. It should be either "+" or "-".

5. Start Index

The reference index of the 5'-end (3'-end) of a forward (reverse) read. Reference indices are 1-based numbers (i.e. the index of the first base in each chromosome is one). In Figure SA, the start index of *Read1* is 1,725 and that of *Read2* is 2,120.

6. Read Length

The length of the read.

7. Locations of Substitutions

The locations of substitution errors in a read. Each substitution error is represented using this notation: <Read Index of the Error>:<Original Base>-><Erroneous Base>. Read indices are given to each base in a read if there is a corresponding base in the reference sequence. Therefore, inserted bases do not have read indices while deleted bases have them. The original base is an error-free base in a reference sequence and the erroneous base is a base with an error in the read. Multiple substitution errors in a read can be represented by concatenating the representation for each error. For example, the substitution error in *Read1* of Figure SA, *Read2* of Figure SA, *Read2* of Figure SB, and, *Read2* of Figure SC can be represented as "4:T->C;", "5:G->A;", "3:G->C;", and "5:G->A;", respectively.

8. Locations of Insertions

The locations of insertion errors in a read. Each insertion error is represented using this notation: <Insertion Location>:<Inserted Bases>;. The insertion location is the read index of the base that is to the left of the inserted bases. There can be multiple bases in the inserted bases field if the length of the inserted bases is longer than one. In Figure SB, the inserted base G in *Read1* can be represented as

"3:G;". The insertion location of the bases that are inserted to the left of the first base in the read is 0. In Figure SB, the insertion TT in *Read2* can be represented as "0:TT;".

9. Locations of Deletions

The locations of deletion errors in a read. Each deletion error is represented using this notation:

<Deletion Location>:<Deleted Base>;. The deletion location is the read index of the deleted base. The length of the deleted base should be always one, and deletions longer than one should be represented with multiple single deletions. In Figure SC, the deleted base C in *Read1* and deleted bases GA in *Read2* can be represented as "5:C;" and "2:G;3:A;", respectively.

REPRODUCING THE RESULTS FOR DNA ILLUMINA READS

1. Software Version

Table S. Software version.

Software	Version
ALLPATHS-LG	51646
BFC	Download on 02/20/2015
BLESS	0.24
Blue	1.1.2
Bowtie	1.0.1
Bowtie2	2.2.4
BWA	0.7.9a
Coral	1.4
ECHO	1.12
Fiona	Download on 01/12/2015
HiTEC	1.0.2
Lighter	Downloaded on 12/18/2014
MPICH	3.1.3
Musket	1.1.0
pIRS	1.1.0
Quake	0.3.5
QuorUM	1.0.0
RACER	1.0.1
Reptile	1.1
samtools	0.1.19
SGA	Download on 12/18/2014
SOAPec	2.01
tabix [4]	0.2.6
Trowel	0.1.3
vcftools	0.1.12a

2. Generating Simulated Reads Using pIRS

2.1. Generating a diploid genome

```
pirs diploid ref.fasta -c 0 -o ref1  
pirs diploid ref1.fa -c 0 -o ref2
```

2.2. Simulating reads

```
pirs simulate -i ref1.fa -l ref2.fa -s $base_call_profile -d $gc_content_profile -b $indel_profile -l 100 \
-x $coverage -m 400 -c 0 -o prefix
# base_call_profile = humNew.PE100.matrix.gz
# gc_content_profile = humNew.gcdep_200.dat
# indel_profile = phix2.InDel.matrix
# D*-10X: coverage = 10
# D*-20X: coverage = 20
# D*-30X: coverage = 30
# D*-40X: coverage = 40
```

2.3. Converting a info file to an error location file

```
perl info2location.dna -info prefix_100_400.read.info.gz \
-location prefix_100_400.read.location -q1 prefix_100_400_1.fq -q2 prefix_100_400_2.fq
```

3. Generating an Error Location File from Real Reads

The tools used in the blue lines can be substituted with alternative tools. For example, it is allowed to use Bowtie2 and GATK to call variants and to generate a new reference sequence using the variants.

```
# aligning reads to a reference sequence
bwa mem -t 12 ref read1.fastq read2.fastq | \
samtools view -Shb - | \
samtools sort - prefix
samtools index prefix.bam

# calling variants using samtools
samtools mpileup -u -f ref.fasta prefix.bam > prefix.mpileup
bcftools view -vcg prefix.mpileup | \
bgzip > prefix.vcf.gz
tabix -p vcf prefix.vcf.gz

# generating a new reference sequence
vcf-consensus prefix.vcf.gz > new.fasta

# aligning reads to the new reference sequence
bwa index -a bwtsv -p new new.fasta
bwa mem -t 12 new read1.fq read2.fastq | \
samtools view -Shb -f 0x0002 - | \
samtools view -b -F 0x0100 - | \
samtools view -b -F 0x0800 -o newly-aligned.bam -

# generating an error location file (output.location)
perl bam2location.paired.common -bam newly-aligned.bam -prefix output -q1 read1.fastq \
-q2 read2.fastq

# optional flow
# generate a new vcf file realigned.vcf using new.fasta: omitted here

# remove substitutions that happened due to heterozygous alleles
remove-heterozygosity-from-location.common -location output.location -vcf realigned.vcf \
-out realigned.location
```

4. Correcting Errors

4.1. ALLPATHS-LG

```
perl ErrorCorrectReads.pl PHRED_ENCODING=64 READS_OUT=prefix MAX_MEMORY_GB=20 \  
PAIRED_READS_A_IN=read1.fastq PAIRED_READS_B_IN=read2.fastq PAIRED_SEP=$sep \  
PAIRED_STDEV=$sep_stdev PLOIDY=2 REMOVE_DODGY_READS=0 THREADS=12
```

I1-10X: *sep* = 400; *sep_stdev* = 100

I1-20X: *sep* = 400; *sep_stdev* = 100

I1-30X: *sep* = 400; *sep_stdev* = 100

I1-40X: *sep* = 400; *sep_stdev* = 100

I2-10X: *sep* = 400; *sep_stdev* = 100

I2-20X: *sep* = 400; *sep_stdev* = 100

I2-30X: *sep* = 400; *sep_stdev* = 100

I2-40X: *sep* = 400; *sep_stdev* = 100

I3-10X: *sep* = 400; *sep_stdev* = 100

I3-20X: *sep* = 400; *sep_stdev* = 100

I3-30X: *sep* = 400; *sep_stdev* = 100

I3-40X: *sep* = 400; *sep_stdev* = 100

I4-10X: *sep* = 400; *sep_stdev* = 100

I4-20X: *sep* = 400; *sep_stdev* = 100

I4-30X: *sep* = 400; *sep_stdev* = 100

I4-40X: *sep* = 400; *sep_stdev* = 100

I5-10X: *sep* = 400; *sep_stdev* = 100

I5-20X: *sep* = 400; *sep_stdev* = 100

I5-30X: *sep* = 400; *sep_stdev* = 100

I5-40X: *sep* = 400; *sep_stdev* = 100

I6: *sep* = 550; *sep_stdev* = 150

4.2 BFC

```
bfc -s $genome_length -k $k -t 12 -c $count -Q read.fastq > corrected.fasta
```

```
# I1-10X: k = 21; count = 2, genome_length = 4,600,000  
# I1-20X: k = 21; count = 2, genome_length = 4,600,000  
# I1-30X: k = 21; count = 2, genome_length = 4,600,000  
# I1-40X: k = 23; count = 2, genome_length = 4,600,000  
# I2-10X: k = 19; count = 2, genome_length = 5,400,000  
# I2-20X: k = 19; count = 2, genome_length = 5,400,000  
# I2-30X: k = 22; count = 2, genome_length = 5,400,000  
# I2-40X: k = 25; count = 3, genome_length = 5,400,000  
# I3-10X: k = 17; count = 2, genome_length = 30,000,000  
# I3-20X: k = 27; count = 2, genome_length = 30,000,000  
# I3-30X: k = 31; count = 3, genome_length = 30,000,000  
# I3-40X: k = 41; count = 3, genome_length = 30,000,000  
# I4-10X: k = 43; count = 2, genome_length = 88,000,000  
# I4-20X: k = 49; count = 4, genome_length = 88,000,000  
# I4-30X: k = 49; count = 4, genome_length = 88,000,000  
# I4-40X: k = 59; count = 4, genome_length = 88,000,000  
# I5-10X: k = 19; count = 2, genome_length = 230,000,000  
# I5-20X: k = 41; count = 2, genome_length = 230,000,000  
# I5-30X: k = 45; count = 2, genome_length = 230,000,000  
# I5-40X: k = 49; count = 3, genome_length = 230,000,000  
# I6: k = 19; count = 3, genome_length = 5,400,000
```

4.3. BLESS

```
# single node run
bless -read1 read1.fastq -read2 read2.fastq -prefix prefix -kmerlength $k -count $count

# using MPI (MPICH and Hydra)
mpirun -ppn 1 -bind-to board bless -read1 read1.fastq -read2 read2.fastq -prefix prefix \
-kmerlength $k -count $count

# I1-10X:  $k = 20$ ;  $count = 2$ 
# I1-20X:  $k = 20$ ;  $count = 3$ 
# I1-30X:  $k = 22$ ;  $count = 3$ 
# I1-40X:  $k = 24$ ;  $count = 3$ 
# I2-10X:  $k = 19$ ;  $count = 2$ 
# I2-20X:  $k = 21$ ;  $count = 3$ 
# I2-30X:  $k = 28$ ;  $count = 3$ 
# I2-40X:  $k = 28$ ;  $count = 4$ 
# I3-10X:  $k = 23$ ;  $count = 2$ 
# I3-20X:  $k = 29$ ;  $count = 3$ 
# I3-30X:  $k = 34$ ;  $count = 3$ 
# I3-40X:  $k = 34$ ;  $count = 4$ 
# I4-10X:  $k = 38$ ;  $count = 3$ 
# I4-20X:  $k = 40$ ;  $count = 5$ 
# I4-30X:  $k = 41$ ;  $count = 7$ 
# I4-40X:  $k = 44$ ;  $count = 8$ 
# I5-10X:  $k = 29$ ;  $count = 2$ 
# I5-20X:  $k = 42$ ;  $count = 2$ 
# I5-30X:  $k = 43$ ;  $count = 3$ 
# I5-40X:  $k = 47$ ;  $count = 3$ 
# I6:  $k = 19$ ;  $count = 7$ 
```


4.4. Blue

```
mono Tessel.exe -k $k -g $genome_length -t 12 -f fastq prefix read1.fastq read2.fastq
mono GenerateMerPairs.exe -t 12 prefix_${k}.cbt read1.fastq read2.fastq
mono Blue.exe -r corrected -m $count -f fastq -t 12 -o outdir -variable -paired prefix_${k}.cbt
read1.fastq read2.fastq
```

```
# I1-10X: k = 27; count = 2; genome_length = 4,600,000
# I1-20X: k = 28; count = 2; genome_length = 4,600,000
# I1-30X: k = 31; count = 3; genome_length = 4,600,000
# I1-40X: k = 31; count = 3; genome_length = 4,600,000
# I2-10X: k = 20; count = 2; genome_length = 5,400,000
# I2-20X: k = 27; count = 2; genome_length = 5,400,000
# I2-30X: k = 30; count = 3; genome_length = 5,400,000
# I2-40X: k = 31; count = 3; genome_length = 5,400,000
# I3-10X: k = 29; count = 2; genome_length = 30,000,000
# I3-20X: k = 31; count = 2; genome_length = 30,000,000
# I3-30X: k = 31; count = 3; genome_length = 30,000,000
# I3-40X: k = 31; count = 3; genome_length = 30,000,000
# I4-10X: k = 31; count = 3; genome_length = 88,000,000
# I4-20X: k = 31; count = 4; genome_length = 88,000,000
# I4-30X: k = 31; count = 6; genome_length = 88,000,000
# I4-40X: k = 31; count = 7; genome_length = 88,000,000
# I5-10X: k = 31; count = 2; genome_length = 230,000,000
# I5-20X: k = 31; count = 2; genome_length = 230,000,000
# I5-30X: k = 31; count = 2; genome_length = 230,000,000
# I5-40X: k = 31; count = 2; genome_length = 230,000,000
# I6: k = 22; count = 7; genome_length = 5,400,000
```

4.5. Coral

```
coral -fq read.fastq -o corrected.fastq -k $k -t 0.75 -p 12
```

```
# I1-10X:  $k = 19$ 
```

```
# I1-20X:  $k = 17$ 
```

```
# I1-30X:  $k = 17$ 
```

```
# I1-40X:  $k = 17$ 
```

```
# I2-10X:  $k = 17$ 
```

```
# I2-20X:  $k = 16$ 
```

```
# I2-30X:  $k = 16$ 
```

```
# I2-40X:  $k = 16$ 
```

```
# I3-10X:  $k = 17$ 
```

```
# I4-10X:  $k = 10$ 
```

```
# I4-20X:  $k = 10$ 
```

```
# I6:  $k = 20$ 
```

4.6. ECHO

```
python ErrorCorrection.py --ncpu 12 --nh 256 -l out.log -o corrected.fastq read.fastq
```

4.7 Fiona

```
fiona_illumina -g $genome_length -e $error_rate -nt 12 read.fastq corrected.fasta
```

```
# I1-10X: genome_length = 4,600,000; error_rate = 0.4
```

```
# I1-20X: genome_length = 4,600,000; error_rate = 0.4
```

```
# I1-30X: genome_length = 4,600,000; error_rate = 0.4
```

```
# I1-40X: genome_length = 4,600,000; error_rate = 0.4
```

```
# I2-10X: genome_length = 5,400,000; error_rate = 0.4
```

```
# I2-20X: genome_length = 5,400,000; error_rate = 0.4
```

```
# I2-30X: genome_length = 5,400,000; error_rate = 0.4
```

```
# I2-40X: genome_length = 5,400,000; error_rate = 0.4
```

```
# I3-10X: genome_length = 30,000,000; error_rate = 0.4
```

```
# I3-20X: genome_length = 30,000,000; error_rate = 0.4
```

```
# I3-30X: genome_length = 30,000,000; error_rate = 0.4
```

```
# I3-40X: genome_length = 30,000,000; error_rate = 0.4
```

```
# I4-10X: genome_length = 88,000,000; error_rate = 0.4
```

```
# I6: genome_length = 5,400,000; error_rate = 0.2
```

4.8. HiTEC

```
hitec read.fasta corrected.fasta $genome_length $error_rate
```

```
# I1-10X: genome_length = 4,600,000; error_rate = 0.4  
# I1-20X: genome_length = 4,600,000; error_rate = 0.4  
# I1-30X: genome_length = 4,600,000; error_rate = 0.4  
# I1-40X: genome_length = 4,600,000; error_rate = 0.4  
# I2-10X: genome_length = 5,400,000; error_rate = 0.4  
# I2-20X: genome_length = 5,400,000; error_rate = 0.4  
# I2-30X: genome_length = 5,400,000; error_rate = 0.4  
# I2-40X: genome_length = 5,400,000; error_rate = 0.4  
# I3-10X: genome_length = 30,000,000; error_rate = 0.4  
# I3-20X: genome_length = 30,000,000; error_rate = 0.4  
# I3-30X: genome_length = 30,000,000; error_rate = 0.4  
# I3-40X: genome_length = 30,000,000; error_rate = 0.4  
# I4-10X: genome_length = 88,000,000; error_rate = 0.4  
# I6: genome_length = 5,400,000; error_rate = 0.2
```

4.9. Lighter

The "trim" option was not used because it would make Lighter generate too short reads that cannot be evaluated. For example, the length of some reads were reduced from 100 bp to 2 bp.

```
lighter -r read1.fastq -r read2.fastq -k $k $genome_length $alpha -od ourdir -t 12 -all
```

```
# I1-20X: k = 26; genome_length = 4,600,000; alpha = 0.350  
# I1-30X: k = 24; genome_length = 4,600,000; alpha = 0.233  
# I1-40X: k = 25; genome_length = 4,600,000; alpha = 0.175  
# I2-20X: k = 22; genome_length = 5,400,000; alpha = 0.350  
# I2-30X: k = 24; genome_length = 5,400,000; alpha = 0.233  
# I2-40X: k = 27; genome_length = 5,400,000; alpha = 0.175  
# I3-20X: k = 29; genome_length = 30,000,000; alpha = 0.350  
# I3-30X: k = 30; genome_length = 30,000,000; alpha = 0.233  
# I3-40X: k = 32; genome_length = 30,000,000; alpha = 0.175  
# I4-20X: k = 32; genome_length = 88,000,000; alpha = 0.350  
# I4-30X: k = 32; genome_length = 88,000,000; alpha = 0.233  
# I4-40X: k = 32; genome_length = 88,000,000; alpha = 0.175  
# I5-20X: k = 32; genome_length = 230,000,000; alpha = 0.350  
# I5-30X: k = 32; genome_length = 230,000,000; alpha = 0.233  
# I5-40X: k = 32; genome_length = 230,000,000; alpha = 0.175  
# I6: k = 19; genome_length = 5,400,000; alpha = 0.175
```

4.10. Musket

```
musket -k $k $estimated_num_kmers -p 12 read.fasta -o corrected.fasta -minmulti $minmulti \
-inorder
```

```
# I1-10X: k = 23; minmulti = 2; estimated_num_kmers = 4,600,000
# I1-20X: k = 23; minmulti = 2; estimated_num_kmers = 4,600,000
# I1-30X: k = 24; minmulti = 3; estimated_num_kmers = 4,600,000
# I1-40X: k = 25; minmulti = 4; estimated_num_kmers = 4,600,000
# I2-10X: k = 21; minmulti = 2; estimated_num_kmers = 5,400,000
# I2-20X: k = 22; minmulti = 3; estimated_num_kmers = 5,400,000
# I2-30X: k = 24; minmulti = 4; estimated_num_kmers = 5,400,000
# I2-40X: k = 25; minmulti = 4; estimated_num_kmers = 5,400,000
# I3-10X: k = 27; minmulti = 2; estimated_num_kmers = 30,000,000
# I3-20X: k = 27; minmulti = 3; estimated_num_kmers = 30,000,000
# I3-30X: k = 27; minmulti = 4; estimated_num_kmers = 30,000,000
# I3-40X: k = 27; minmulti = 5; estimated_num_kmers = 30,000,000
# I4-10X: k = 27; minmulti = 5; estimated_num_kmers = 88,000,000
# I4-20X: k = 27; minmulti = 8; estimated_num_kmers = 88,000,000
# I4-30X: k = 27; minmulti = 11; estimated_num_kmers = 88,000,000
# I4-40X: k = 27; minmulti = 15; estimated_num_kmers = 88,000,000
# I5-10X: k = 27; minmulti = 2; estimated_num_kmers = 230,000,000
# I5-20X: k = 27; minmulti = 3; estimated_num_kmers = 230,000,000
# I5-30X: k = 27; minmulti = 4; estimated_num_kmers = 230,000,000
# I5-40X: k = 28; minmulti = 6; estimated_num_kmers = 230,000,000
# I6: k = 19; minmulti = 8; estimated_num_kmers = 5,400,000
```

4.11. Quake

```
cat read.fastq | count-kmers -k $k > count.out  
correct -r read.fastq -k $k -c $cutoff -m count.out -p 12 -u
```

```
# I1-10X:  $k = 17$ ,  $cutoff = 2$   
# I1-20X:  $k = 17$ ,  $cutoff = 3$   
# I1-30X:  $k = 17$ ,  $cutoff = 3$   
# I1-40X:  $k = 18$ ,  $cutoff = 3$   
# I2-10X:  $k = 16$ ,  $cutoff = 2$   
# I2-20X:  $k = 16$ ,  $cutoff = 3$   
# I2-30X:  $k = 17$ ,  $cutoff = 4$   
# I2-40X:  $k = 16$ ,  $cutoff = 4$   
# I3-10X:  $k = 18$ ,  $cutoff = 2$   
# I3-20X:  $k = 18$ ,  $cutoff = 3$   
# I3-30X:  $k = 18$ ,  $cutoff = 4$   
# I3-40X:  $k = 18$ ,  $cutoff = 5$   
# I4-10X:  $k = 18$ ,  $cutoff = 5$   
# I4-20X:  $k = 18$ ,  $cutoff = 8$   
# I4-30X:  $k = 18$ ,  $cutoff = 11$   
# I4-40X:  $k = 18$ ,  $cutoff = 15$   
# I5-10X:  $k = 18$ ,  $cutoff = 2$   
# I5-20X:  $k = 18$ ,  $cutoff = 3$   
# I5-30X:  $k = 18$ ,  $cutoff = 5$   
# I5-40X:  $k = 18$ ,  $cutoff = 6$   
# I6:  $k = 14$ ,  $cutoff = 9$ 
```

4.12. QuorUM

```
quorum -s 160000000 -t 12 -p prefix -k $k -q 64 --min-count $min_count read.fastq
```

```
# I1-10X: k = 20; min_count = 2  
# I1-20X: k = 22; min_count = 2  
# I1-30X: k = 23; min_count = 2  
# I1-40X: k = 25; min_count = 2  
# I2-10X: k = 19; min_count = 2  
# I2-20X: k = 20; min_count = 2  
# I2-30X: k = 25; min_count = 2  
# I2-40X: k = 24; min_count = 2  
# I3-10X: k = 24; min_count = 2  
# I3-20X: k = 32; min_count = 2  
# I3-30X: k = 33; min_count = 2  
# I3-40X: k = 34; min_count = 3  
# I4-10X: k = 42; min_count = 2  
# I4-20X: k = 46; min_count = 4  
# I4-30X: k = 46; min_count = 6  
# I4-40X: k = 46; min_count = 8  
# I5-10X: k = 36; min_count = 2  
# I5-20X: k = 38; min_count = 2  
# I5-30X: k = 40; min_count = 2  
# I5-40X: k = 40; min_count = 3  
# I6: k = 18; min_count = 2
```


4.13. RACER

RACER read.fasta corrected.fasta \$genome_length

I1-*0X: genome_length = 4,600,000

I2-*0X: genome_length = 5,400,000

I3-*0X: genome_length = 30,000,000

I4-*0X: genome_length = 88,000,000

I5-*0X: genome_length = 230,000,000

I6: genome_length = 5,400,000

4.14. Reptile

The three variables k , $step$, and T_card were manually changed and the best value was chosen.

$QThreshold$, Qlb , and $T_expGoodCnt$ were chosen by the method described in the tool's manual.

```
# MaxBadQPerKmer = 20 for all the inputs
# Qthreshold = 103; Qlb = 96 for I1-I5
# Qthreshold = 71; Qlb = 68 for I6

# I1-10X: k = step = 11; T_expGoodCnt = 14; T_card = 2
# I1-20X: k = step = 11; T_expGoodCnt = 26; T_card = 2
# I1-30X: k = step = 11; T_expGoodCnt = 36; T_card = 2
# I1-40X: k = step = 11; T_expGoodCnt = 44; T_card = 2
# I2-10X: k = step = 10; T_expGoodCnt = 14; T_card = 2
# I2-20X: k = step = 11; T_expGoodCnt = 22; T_card = 2
# I2-30X: k = step = 11; T_expGoodCnt = 30; T_card = 2
# I2-40X: k = step = 11; T_expGoodCnt = 38; T_card = 3
# I3-10X: k = step = 12; T_expGoodCnt = 14; T_card = 2
# I3-20X: k = step = 12; T_expGoodCnt = 22; T_card = 2
# I3-30X: k = step = 12; T_expGoodCnt = 32; T_card = 2
# I3-40X: k = step = 12; T_expGoodCnt = 40; T_card = 2
# I4-10X: k = step = 12; T_expGoodCnt = 36; T_card = 2
# I4-20X: k = step = 12; T_expGoodCnt = 38; T_card = 4
# I4-30X: k = step = 12; T_expGoodCnt = 44; T_card = 6
# I4-40X: k = step = 13; T_expGoodCnt = 44; T_card = 7
# I5-10X: k = step = 12; T_expGoodCnt = 12; T_card = 2
# I5-20X: k = step = 13; T_expGoodCnt = 20; T_card = 2
# I5-30X: k = step = 13; T_expGoodCnt = 26; T_card = 2
# I5-40X: k = step = 13; T_expGoodCnt = 34; T_card = 2
# I6: k = step = 11; T_expGoodCnt = 42; T_card = 3
```

4.15. SGA

```
sga preprocess --pe-mode 1 --phred64 -o tmp.fastq reda1.fastq read2.fastq
```

```
sga index -a ropebwt -t 12 --no-reverse tmp.fastq
```

```
sga correct -k $k -x $kmer_threshold -t 12 -o corrected.fastq tmp.fastq
```

```
# I1-10X: k = 22, kmer_threshold = 2
```

```
# I1-20X: k = 25, kmer_threshold = 2
```

```
# I1-30X: k = 25, kmer_threshold = 3
```

```
# I1-40X: k = 29, kmer_threshold = 3
```

```
# I2-10X: k = 21, kmer_threshold = 2
```

```
# I2-20X: k = 26, kmer_threshold = 2
```

```
# I2-30X: k = 31, kmer_threshold = 3
```

```
# I2-40X: k = 35, kmer_threshold = 3
```

```
# I3-10X: k = 26, kmer_threshold = 2
```

```
# I3-20X: k = 40, kmer_threshold = 2
```

```
# I3-30X: k = 48, kmer_threshold = 2
```

```
# I3-40X: k = 48, kmer_threshold = 3
```

```
# I4-10X: k = 50, kmer_threshold = 3
```

```
# I4-20X: k = 57, kmer_threshold = 4
```

```
# I4-30X: k = 60, kmer_threshold = 5
```

```
# I4-40X: k = 62, kmer_threshold = 6
```

```
# I5-10X: k = 32, kmer_threshold = 2
```

```
# I5-20X: k = 48, kmer_threshold = 2
```

```
# I5-30X: k = 50, kmer_threshold = 2
```

```
# I5-40X: k = 51, kmer_threshold = 3
```

```
# I6: k = 21, kmer_threshold = 7
```

4.16. SOAPec

```
KmerFreq_HA -k $k -t 12 -p prefix -l input.list
```

```
Corrector_HA -k $k -l $cutoff -a 1 -t 12 -o 3 prefix.freq.gz input.list
```

```
# I1-10X:  $k = 17$ ,  $cutoff = 2$ 
```

```
# I1-20X:  $k = 18$ ,  $cutoff = 2$ 
```

```
# I1-30X:  $k = 19$ ,  $cutoff = 2$ 
```

```
# I1-40X:  $k = 21$ ,  $cutoff = 2$ 
```

```
# I2-10X:  $k = 15$ ,  $cutoff = 2$ 
```

```
# I2-20X:  $k = 16$ ,  $cutoff = 2$ 
```

```
# I2-30X:  $k = 23$ ,  $cutoff = 2$ 
```

```
# I2-40X:  $k = 21$ ,  $cutoff = 3$ 
```

```
# I3-10X:  $k = 19$ ,  $cutoff = 2$ 
```

```
# I3-20X:  $k = 27$ ,  $cutoff = 2$ 
```

```
# I3-30X:  $k = 27$ ,  $cutoff = 2$ 
```

```
# I3-40X:  $k = 27$ ,  $cutoff = 3$ 
```

```
# I4-10X:  $k = 27$ ,  $cutoff = 3$ 
```

```
# I4-20X:  $k = 27$ ,  $cutoff = 5$ 
```

```
# I4-30X:  $k = 27$ ,  $cutoff = 8$ 
```

```
# I4-40X:  $k = 27$ ,  $cutoff = 10$ 
```

```
# I5-10X:  $k = 24$ ,  $cutoff = 2$ 
```

```
# I5-20X:  $k = 27$ ,  $cutoff = 2$ 
```

```
# I5-30X:  $k = 27$ ,  $cutoff = 3$ 
```

```
# I5-40X:  $k = 27$ ,  $cutoff = 4$ 
```

```
# I6:  $k = 15$ ,  $cutoff = 6$ 
```

4.17. Trowel

```
echo "read1.fastq" > list.file  
echo "read2.fastq" >> list.file  
trowel -f list.file -k $k -t 12
```

```
# I1-10X:  $k = 19$   
# I1-20X:  $k = 30$   
# I1-30X:  $k = 19$   
# I1-40X:  $k = 19$   
# I2-10X:  $k = 19$   
# I2-20X:  $k = 25$   
# I2-30X:  $k = 19$   
# I2-40X:  $k = 19$   
# I3-10X:  $k = 25$   
# I3-20X:  $k = 25$   
# I3-30X:  $k = 19$   
# I3-40X:  $k = 19$   
# I4-10X:  $k = 31$   
# I4-20X:  $k = 21$   
# I4-30X:  $k = 20$   
# I4-40X:  $k = 21$   
# I6:  $k = 19$ 
```

5. Generating a BAM File for Coverage Analyses

For generating detailed accuracy analysis results, users need to generate a BAM file and give it to SPECTACLE. It is allowed to use other alignment tools instead of bowtie but reads should be aligned using the paired-end alignment capability. SPECTACLE checks the 0x0002 flag to filter out the reads that are not pairwise aligned. Therefore, all the reads should be aligned using the pairwise alignment method.

Generating prefix1.bam file using Ref 1 (I1-I6)

```
bowtie --phred64-quals --seed 0 -a -n 0 -p 12 -q -S -t -v 0 -X 2000 ref1 -1 read1.fastq -2 read2.fastq \
tmp1.sam
perl unaligned2sam.common -fastq1 read1.fastq -fastq2 read2.fastq -genome 1 \
-location location.file -prefix prefix1 -ref ref1.fa -sam tmp1.sam -samtools samtools
```

Generating prefix2.bam file using Ref 2 (I1-I5)

This process is not needed for I6 because it has only one reference sequence

```
bowtie --phred64-quals --seed 0 -a -n 0 -p 12 -q -S -t -v 0 -X 2000 ref2 -1 read1.fastq -2 read2.fastq \
tmp2.sam
perl unaligned2sam.common -fastq1 read1.fastq -fastq2 read2.fastq -genome 2 \
-location location.file -prefix prefix2 -ref ref2.fa -sam tmp2.sam -samtools samtools
```

6. Evaluate Corrected Reads Using SPECTACLE

1. I1-I5 (two reference sequences)

add "-detail prefix depth -bam1 prefix1.bam -bam2 prefix2.bam -samtools samtools" for coverage

analysis

format: fasta or fastq

paired-end input/output

```
mpiexec perl evaluate.dna -ref1 ref1.fa -ref2 ref2.fa -location location.file \  
-org${format}1 read1.${format} -org${format}2 read2.${format} -cor${format}1 \  
corrected1.${format} -cor${format}2 corrected2.${format}
```

single-end input/output

```
mpiexec perl evaluate.dna -ref1 ref1.fa -ref2 ref2.fa -location location.file \  
-org${format} read.${format} -cor${format} corrected.${format}
```

2. I6 (one reference sequence)

add "-detail prefix depth -bam1 prefix1.bam -samtools samtools" for complete analysis

paired-end input/output

```
mpiexec perl evaluate.dna -ref1 ref1.fa -location location. -org${format}1 \  
read1.${format} -org${format}2 read2.${format} -cor${format}1 corrected1.${format} \  
-cor${format}2 corrected2.${format}
```

single-end input/output

```
mpiexec perl evaluate.dna -ref1 ref1.fa -location location. -org${format} \  
read.${format} -cor${format} corrected.${format}
```

7. Alignment Analysis

```
split-ab.common -1 read1.fastq -2 read2.fastq -format fastq -loc location.file -p prefix
```

```
# the option "-q" should be changed to "-n" if corrected output files are fasta files
```

```
bowtie --phred64-quals --seed 0 -a -n 0 -p 12 -q -S -t -v 0 -X 2000 ref1 \  
-1 prefix.genome-a.1.fastq -2 prefix.genome-a.2.fastq tmp1.sam
```

```
perl compare-location-sam -genome 1 -loc location.file -prefix prefix1 \  
-sam tmp1.sam
```

```
# the option "-q" should be changed to "-n" if corrected output files are fasta files
```

```
bowtie --phred64-quals --seed 0 -a -n 0 -p 12 -q -S -t -v 0 -X 2000 ref2 \  
-1 prefix.genome-b.1.fastq -2 prefix.genome-b.2.fastq tmp2.sam
```

```
perl compare-location-sam -genome 2 -loc location.file -prefix prefix2 \  
-sam tmp2.sam
```


REPRODUCING THE EVALUATION RESULTS FOR RNA ILLUMINA READS

1. Software Version

Table S. Software version.

Software	Version
BEERS	Downloaded on 04/30/2014
Jellyfish [5]	1.1.11
SEECER	0.1.3
simNGS	05/02/2013
Tophat [1]	2.0.12

2. Generating Simulated Reads

2.1. Generating error-free reads using BEERS

```
# Download http://itmat.rum.s3.amazonaws.com/simulator_config_mouse.tar.gz and unzip it
# into the directory mouse
# Get IDs of genes in mouse chromosome X from simulator_config_geneinfo
# and save them to mouse.chrx/mouse.chrx.id
perl make_config_files_for_subset_of_gene_ids.pl mouse_chrx mouse.chrx/mouse.chrx.id \
mouse mouse.chrx
perl reads_simulator.pl 4,000,000 prefix -error 0 -subfreq 0 -indelfreq 0 -readlength 100 \
-outdir output -customcfgdir mouse.chrx -configstem mouse_chrx
```

2.2. Generating erroneous reads using the BEERS output and simNGS

```
simNGS -n 100 -o fastq -O mouse.chrx -s 0 $run s_3_4x.runfile simulated_reads_mouse.chrx.fa
```

2.3. Generating a location file

```
mpiexec perl info2location.rna -errfreefasta simulated_reads_mouse.chrx.fa -errfastq \
mouse.chrx.fq -prefix mouse.chrx
```

3. Generating an Error Location File Using Real Reads

In this example, Tophat is used for aligning reads into a reference sequence, but it can be substituted with alternative tools.

```
tophat -r $inner_distance -o output -p 12 -g 1 --no-sort-bam --no-discordant --no-mixed \
ref read1.fastq read2.fastq

samtools view -b -f 0x0002 output/accepted_hits.bam | \
samtools view -b -F 0x0100 - | \
samtools view -b -F 0x0800 -o output/tmp.bam -

perl ${spectacle}/bam2location.common -bam output/tmp.bam -prefix output/final -q1 read1.fastq \
-q2 read2.fastq -tmp output
```

4. Correcting Errors

4.1. SEECER

We tried to run SEECER with the mouse chromosome X reads that were generated using the flow described in "Generating Simulated RNA reads", but we got the following k dependent error messages:

ERROR!!!! CTTGGTCATCTGGTTCCTGCAGGATTT AAATCCTGCAGGAACCAGATGACCAAG 21

Kmer count is not correct. Sorry we have to crash!

```
run_seecer.sh -t output -k $k -j jellyfish read1.fastq read2.fastq
```

5. Evaluate Corrected Reads Using SPECTACLE

when corrected outputs are fastq files

```
mpiexec perl evaluate.rna -reffasta1 error-free1.fa -reffasta2 error-free2.fa -location \
location.file -orgfastq1 read1.fastq -orgfastq2 read2.fastq -corfastq1 corrected1.fastq -corfastq2 \
corrected2.fastq
```

when input files are fastq files and corrected outputs are fasta files

```
mpiexec perl evaluate.rna -reffasta1 error-free1.fa -reffasta2 error-free2.fa -location \
location.file -orgfastq1 read1.fastq -orgfastq2 read2.fastq -corfasta1 corrected1.fa -corfasta2 \
corrected2.fa
```

when both input files and corrected outputs are fasta files

```
mpiexec perl evaluate.rna -reffasta1 error-free1.fa -reffasta2 error-free2.fa -location \
location.file -orgfasta1 read1.fa -orgfasta2 read2.fa -corfasta1 corrected1.fa -corfasta2 corrected2.fa
```

REPRODUCING THE EVALUATION RESULTS FOR TGS (PACBIO AND ONT) READS

1. Software Version

Table S. Software version.

Software	Version
LAST	531
LoRDEC	0.4
LSC	1.beta
PBSIM	1.0.3
PBcR	Celera Assembler 8.2
Proovread	Downloaded on 03/14/2015
NanoCorr	Downloaded on 10/15/2016
NaS	NaS_v2 downloaded on 10/15/2016

2. Generating Simulated Reads (PacBio)

2.1. Generating simulated reads using PBSIM

```
pbsim --data-type CLR --prefix prefix --depth 20 --length-min 500 --length-max 15000 \  
--seed 1 --model_qc data/model_qc_clr ref.fa  
  
cat prefix_*.fastq > prefix.fastq  
  
for each_maf in prefix_*.maf; do  
    new_maf=${each_maf/.maf/.mod.maf}  
    each_ref=${each_maf/.maf/.ref}  
    maf-change-ref $each_maf $each_ref > $new_maf  
done  
  
cat prefix_*.mod.maf > prefix.maf  
  
maf-convert sam prefix.maf > prefix.sam
```

2.2. Generating a location file

```
samtools view -T ref.fa -h prefix.sam | \  
samtools calmd -Su - ref.fa | \  
samtools view -hb -o prefix.bam -  
  
perl bam2location.single.common -bam prefix.bam -softclip -prefix prefix.final -q read.fastq
```

3. Generating an Error Location File Using Real Reads

3.1. PacBio

In this example, bwa is used for aligning reads into a reference sequence, but it can be substituted with alternative tools.

```
bwa mem -t 12 -x pacbio ref read.fastq | \  
samtools view -Shb -F 0x0100 - | \  
samtools view -b -F 0x0800 - | \  
samtools view -b -F 0x0004 -o out.bam -  
  
perl bam2location.single.common -bam out.bam -softclip -pacbio -prefix prefix -q read.fastq
```

3.1. ONT

```
bwa mem -t 12 -x ont2d ref read.fastq | \  
samtools view -Shb -F 0x0100 - | \  
samtools view -b -F 0x0800 - | \  
samtools view -b -F 0x0004 -o out.bam -  
  
perl bam2location.single.common -bam out.bam -softclip -prefix prefix -q read.fastq
```

4. Correcting Errors

4.1. LoRDEC (PacBio)

```
lordec-correct -T 12 -2 illumina.fastq -k $k -s $count -i pacbio.fasta -o corrected.fasta
```

```
# P1-10X:  $k = 17$ ,  $count = 2$ 
```

```
# P1-20X:  $k = 18$ ,  $count = 2$ 
```

```
# P1-30X:  $k = 19$ ,  $count = 2$ 
```

```
# P1-40X:  $k = 19$ ,  $count = 2$ 
```

```
# P2-10X:  $k = 19$ ,  $count = 2$ 
```

```
# P2-20X:  $k = 20$ ,  $count = 2$ 
```

```
# P2-30X:  $k = 19$ ,  $count = 2$ 
```

```
# P2-40X:  $k = 19$ ,  $count = 2$ 
```

```
# P2-40X-EF:  $k = 20$ ,  $count = 2$ 
```

4.2. LSC (PacBio)

```
python runLSC.py lsc.cfg

# lsc.cfg
LR_pathfilename = pacbio.fastq
LR_filetype = fq
SR_pathfilename = illumina.fastq
SR_filetype = fq
SCD = $scd
Nthread1 = 12
Nthread2 = 12
sort_max_mem = 1G
I_RemoveBothTails = N
aligner = bowtie2
bowtie2_options = --end-to-end -a -f -L 15 --mp 1,1 --np 1 --rdg 0,1 --rfg 0,1 --score-min L,0,-0.12 \
--no-unal

# P1-10X: scd = 10
# P1-20X: scd = 20
# P1-30X: scd = 30
# P1-40X: scd = 40
# P2-10X: scd = 10
# P2-20X: scd = 20
# P2-30X: scd = 30
# P2-40X: scd = 40
# P2-40X-EF: scd = 40
```

4.3. PBcR (PacBio)

```
fastqToCA -libraryname illumina_library -technology illumina -type sanger -innie -reads \
illumina.fastq > illumina_frg
```

```
PBcR -length 500 -libraryname pacbio_library -s in.spec -fastq pacbio.fastq -genomeSize \
$genome_size illumina_frg
```

```
# in.spec
```

```
assemble=0
```

```
# P1-10X: genome_length = 4,600,000
```

```
# P1-20X: genome_length = 4,600,000
```

```
# P1-30X: genome_length = 4,600,000
```

```
# P1-40X: genome_length = 4,600,000
```

```
# P2-10X: genome_length = 10,000,000
```

```
# P2-10X: genome_length = 10,000,000
```

```
# P2-20X: genome_length = 10,000,000
```

```
# P2-30X: genome_length = 10,000,000
```

```
# P2-40X: genome_length = 10,000,000
```

```
# P2-40X-EF: genome_length = 10,000,000
```

4.4. Proovread (PacBio)


```

SeqChunker -s 20M -o chunk-%03d.fastq pacbio.fastq

for each_chunk in chunk-*.fastq; do
    prefix=${each_chunk/.fastq/}
    proovread -l $each_chunk -s illumina.fastq -p $prefix -t 12 --coverage=$coverage \
    --overwrite --cfg in.config
done

# in.config
'mask-min-gain-frac' => 0.03,
'sr-coverage' => {
    DEF => 30,
},
'bwa-sr-1' => {
    '-a' => "",
    '-Y' => "",
    qw(-k 11 -W 18 -w 40 -r 1 -D 0 -y 20 -A 5 -B 11 -O 2,1 -E 4,3 -T 3 -L 30,30)
},
'bwa-sr' => {
    '-a' => "",
    '-Y' => "",
    qw(-k 12 -W 20 -w 40 -r 1 -D 0 -y 20 -A 5 -B 11 -O 2,1 -E 4,3 -T 2.5 -L 30,30)
},
'bwa-sr-finish' => {
    '-a' => "",
    '-Y' => "",
    qw(-k 17 -W 18 -w 30 -r 1 -D 0 -A 5 -B 13 -O 15,19 -E 3,3 -T 4 -L 30,30)
}

# P1-10X: coverage = 10
# P1-20X: coverage = 20
# P1-30X: coverage = 30
# P1-40X: coverage = 40
# P2-10X: coverage = 10
# P2-20X: coverage = 20
# P2-30X: coverage = 30
# P2-40X: coverage = 40
# P2-40X-EF: coverage = 40

```

4.4. NanoCorr (ONT)

```
python partition.py 100 500 $read_name.fa
for j in {1..$num_files_in_partition}; do
    echo "SGE_TASK_ID=$j TMPDIR=/tmp nanocorr.py query.fa $ref.fa";
done | parallel -j <# of compute cores>
```

4.5. NaS (ONT)

```
$path_to_dir /NaS --fq1 $read1.fastq --fq2 $read2.fastq --nano $ont_read_file.fa --out $out_dir --
mode sensitive --nb_proc $num_threads
```

5. Evaluate Corrected Reads Using SPECTACLE

```
# remove corrected reads that are shorter than 500 bp
perl remove-short-sequence.fasta 500 output.fa > output.filtered.fa

# reorder corrected reads using the precorrection fastq file
perl reorder-fasta.common -infasta output.filtered.fa -outfasta output.final.fa -orgfastq pacbio.fastq

# generate one-to-one mapping between precorrection reads and corrected reads
perl generate-map.fasta.common -corfasta output.final.fa -orgfastq pacbio.fastq -outmap \
output.final.map

# evaluate accuracy of corrected reads
mpiexec perl evaluate.dna -corfasta output.final.fa -orgfastq pacbio.fastq -ref1 ref.fa -location.file \
-map output.final.map -tgs
```

6. Alignment Analysis

6.1. PacBio

```
bwa mem -t 12 -x pacbio refprefix corrected.fa | \  
samtools view -Shb -F 0x0100 - | \  
samtools view -b -F 0x0800 - | \  
samtools view -b -F 0x0004 -o out.bam \ -  
  
perl similarity-bam.common -bam out.bam -fasta corrected.fa
```

6.2. ONT

```
bwa mem -t 12 -x ont2d refprefix corrected.fa | \  
samtools view -Shb -F 0x0100 - | \  
samtools view -b -F 0x0800 - | \  
samtools view -b -F 0x0004 -o out.bam \ -  
  
perl similarity-bam.common -bam out.bam -fasta corrected.fa
```

SPECTACLE USER GUIDE

1. Prerequisites

1.1. GCC

SPECTACLE was tested with gcc 4.9.2.

1.2 MPI package

SPECTACLE was tested with both OpenMPI 1.8.2 and MPICH 3.1.3 (GCC 4.7.1).

1.3. Perl modules

- Bio::DB::Sam (<http://search.cpan.org/~lds/Bio-SamTools/lib/Bio/DB/Sam.pm>)
- IO::Uncompress::Gunzip (<http://search.cpan.org/~pmqs/IO-Compress-2.064/lib/IO/Uncompress/Gunzip.pm>)
- Parallel::MPI::Simple (<http://search.cpan.org/~ajgough/Parallel-MPI-Simple/Simple.pm>)

Installing this module may cause a problem. Makefile.PL executes "mpicc -help" to file compile options but the command may give nothing. In this case, Makefile.PL should be modified. See parallel-mpi-simple/Makefile.PL in the SPECTACLE directory.

- Sys::CPU (<http://search.cpan.org/~mzsanford/Sys-CPU/CPU.pm>)

1.4. SAMtools

In order to use the Bio::DB::Sam module, users need to compile SAMtools with the "-fPIC" option. The option should be added to CFLAGS in the Makefile.

1.5 SWIG

The location of the swig (<http://www.swig.org>) binary should be defined in \$PATH. SPECTACLE was tested with SWIG 3.0.5.

2. Installing SPECTACLE

```
tar zxvf spectacle.vXpXX.tgz
```

```
cd vXpXX
```

```
Make
```

3. Usage

3.1. bam2location.common

Converts a BAM file that are generated using paired-end reads to an error location file.

Option	Description
bam <file>	Input BAM file. All reads that are not pairwise aligned should not be included in the file. Required.
errorfree	Generate error-free fasta files.
h	Prints a help message.
prefix <string>	Output file name prefix. Required.
q1 <file>	Input forward fastq file. Required.
q2 <file>	Input reverse fastq file. Required.
ref	Input reference sequence fasta file.
softclip	Convert softclipped bases into insertions.
thread	Number of threads for sorting. Default: number of cores.
tmp <dir>	Temporary directory name used internally for sorting. Default: system default directory.

3.2. bam2location.single.common

Converts a BAM file that are generated using single-end reads to an error location file.

Option	Description
bam <file>	Input BAM file. All reads that are not pairwise aligned should not be included in the file. Required.
errorfree	Generate a error-free fasta file.
h	Prints a help message.
prefix <string>	Output file name prefix. Required.
q <file>	Input fastq file. Required.
ref	Input reference sequence fasta file.
softclip	Convert softclipped bases into insertions.
thread	Number of threads for sorting. Default: number of cores.
tmp <dir>	Temporary directory name used internally for sorting. Default: system default directory.

3.3. compare-location-sam.dna

Compares the aligned locations in an input SAM file with those in an error location file.

3.3.1. Options

Option	Description
genome <1 or 2>	If reads came from two reference sequences, only reads that were sampled from the specified genome will be compared. If reads came from only one reference sequence, this value should be always 1. Required.
h	Prints a help message.
location <file>	Input error location file. Names of the Reads in this file should be matched with those in an input SAM file. Required.
noout	No output file. The program will print statistics to standard output.
prefix <string>	Output file name prefix. Required.
sam <file>	Input SAM file (pairwise aligned). Names of the reads in this file should be matched with those in an input error location file. Required.
strict	Uses the strict matching method. Aligned locations in an input error location file should be exactly matched with those in an input SAM file regardless of the existence of insertions or deletions.
thread	Number of threads for sorting. Default: number of cores.
t <dir>	Temporary directory name used internally for sorting. Default: system default directory.

3.3.2. Output reports

Item	Description
1.A	Number of read pairs that come from a specified genome. The genome can be specified using "-genome" option.
1.B	Number of read pairs that do not come from a specified genome. Zero for haploid genomes.
1.C	Number of read pairs that do not have corresponding information in the location file (i.e. "N/A" lines in the location file).
1.D	Number of read pairs that are aligned to a correct position.
1.E	Number of read pairs that are aligned to a wrong position.
1.F	Number of read pairs that are not aligned to any position.
2	Percentage of bases in the reference sequence that are covered by aligned read pairs. A read pair can be aligned to multiple positions. Read pairs that are aligned to wrong positions (i.e. 1. (E)) are also included.
3.1	Average number of reads that cover each base in the reference sequence. A read pair can be aligned to multiple positions.
3.2	Average number of reads that cover each base in the reference sequence. Only read pairs that are aligned to a correct position are considered.
4	Samtool binary used.

3.4. evaluate.dna

Evaluates DNA sequencing reads.

3.4.1. Options

Option	Description
bam1 <file>	Input BAM file generated using the flow in "Generating a BAM File for Coverage Analyses"
bam2 <file>	Input BAM file generated using the flow in "Generating a BAM File for Coverage Analyses"
candidate <number>	Max number of alignments that have the same highest score. If a read has alignments above this number, it read will not be evaluated. Default: 30,000
corfasta <file>	Input corrected single-end fasta file. The order of reads should be same as that of an original forward read file. Either corfasta, corfastq, corfasta1 or corfastq1 should be used.
corfasta1 <file>	Input corrected forward read fasta file. The order of reads should be same as that of an original forward read file. Either corfasta, corfasta1 or corfastq1 should be used.
corfasta2 <file>	Input corrected reverse read fasta file. The order of reads should be same as that of an original reverse read file. Required if corfasta1 is used.
corfastq <file>	Input corrected single-end fastq file. The order of reads should be same as that of an original forward read file. Either corfasta, corfastq, corfasta1 or corfastq1 should be used.

corfastq1 <file>	Input corrected forward read fastq file. The order of reads should be same as that of an original forward read file. Either corfasta, corfastq, corfasta1 or corfastq1 should be used.
corfastq2 <file>	Input corrected reverse read fastq file. The order of reads should be same as that of an original reverse read file. Required if corfastq1 is used.
debug <prefix>	Generates debugging files with the specified prefix.
detailed <prefix>	Executes detailed accuracy analysis.
endgap	Penalize end gaps.
gext <number>	Gap extension penalty. Default: -1 (-1 for PacBio reads).
gopen <number>	Gap opening penalty. Default: -6 (-1 for PacBio reads).
h	Prints a help message.
location <file>	Input error location file. The name of reads in this file is not compared with that in input read files. However, the order of the reads should be same in both the files. Required.
-map <file>	Input original-corrected read mapping file. It has two columns; they show read names and the number of corresponding reads in the corrected read file.
match <number>	Match score. Default: 1 (1 for PacBio reads).
maxdepth <number>	Maximum range for reporting the detailed analysis results. Default: 50.
mismatch <number>	Mismatch penalty. Default: -4 (-1 for PacBio reads).
oneref	Load only one chromosome each time.
orgfasta <file>	Input original single-end fasta file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfasta1 <file>	Input original forward read fasta file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfasta2 <file>	Input original reverse read fasta file. Required if orgfasta1 is used.
orgfastq <file>	Input original single-end read fastq file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfastq1 <file>	Input original forward read fastq file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfastq2 <file>	Input original reverse read fastq file. Required if orgfastq1 is used.
outer <number>	The number of extra bases that are taken from a reference sequence to compensate insertions and deletions in the original read.
ref1 <file>	Input fasta file for the first reference sequence Ref 1. Required.
ref2 <file>	Input fasta file for the second reference sequence Ref 2. Required if input reads came from two reference sequences (i.e. Ref 1 and Ref 2).
tgs	Input reads are TGS reads
thread	Number of threads for sorting. Default: number of cores.

3.4.2. Output reports

The items in the output reports are explained below. Each base in corrected reads are categorized using triplets, each character of which should be either Y or N. The first position indicates whether the base in the original read is correct or not, respectively; the second position indicates whether the base has been modified by an error correction tool or not; and the third position indicates whether the base in the corrected read at that position is correct or not. All the bases should fall into one of five categories: NNN, NYN, NYY, YNY, and YYN; YYY, YNN, and NNY are logically impossible.

Supporting reads of base b in read R are the reads that overlap the corresponding base of b in a reference sequence (i.e. R and its supporting reads should be sampled from very close positions).

Items	Description
YYN	Number of bases 1) not erroneous in a precorrection read, 2) modified by an error correction tool, and 3) erroneous in a modified read.
YNY	Number of bases 1) not erroneous in a precorrection read, 2) not modified by an error correction tool, and 3) not erroneous in a modified read.
NYY	Number of bases 1) erroneous in a precorrection read, 2) modified by an error correction tool, and 3) not erroneous in a modified read.
NYY TRIM	NYY made by trimming.
NYN	Number of bases 1) erroneous in a precorrection read, 2) modified by an error correction tool, and 3) still erroneous in a modified read.
NNN	Number of bases 1) erroneous in a precorrection read, 2) not modified by an error correction tool, and 3) erroneous in a modified read.
From SUB to DEL	Number of bases 1) having substitution errors in precorrection reads and 2) changed to deletion errors in corrected reads.
Not evaluated	Number of errors in the reads that have more than 30,000 alignments with the same highest alignment score.
Sensitivity (recall)	$NYY / (NYY + NYN + NNN)$
Gain	$(NYY - YYN - NYN) / (NYY + NYN + NNN)$
Precision	$NYY / (YYN + NYN)$
Specificity	$YNY / (YYN + YNY)$
F-score	$2NYY / (2NYY + YYN + 2NYN + NNN)$
Position	Index: positions of errors in reads. As shown in Figure S, the numbers are the indices of corresponding bases in a reference sequence. Therefore, the number can be larger than read length when deletions exist in a read; Corrected bases: percentage of errors corrected.
(# of Correct Bases) -	Difference: number of supporting reads of a correct base - number of

(# of Erroneous Bases)	supporting reads of an erroneous base; Corrected bases: percentage of errors corrected.
# of Correct Bases	Coverage: number of supporting reads of a correct base, Corrected bases: percentage of errors corrected.

3.5. evaluation.rna

Evaluates RNA sequencing reads.

3.5.1. Options

Option	Description
candidate <number>	Max number of alignments that have the same highest score. If a read has alignments above this number, it read will not be evaluated. Default: 30,000
corfasta <file>	Input corrected single-end fasta file. The order of reads should be same as that of an original forward read file. Either corfasta, corfastq, corfasta1 or corfastq1 should be used.
corfasta1 <file>	Input corrected forward read fasta file. The order of reads should be same as that of an original forward read file. Either corfasta, corfasta1 or corfastq1 should be used.
corfasta2 <file>	Input corrected reverse read fasta file. The order of reads should be same as that of an original reverse read file. Required if corfasta1 is used.
corfastq <file>	Input corrected single-end fastq file. The order of reads should be same as that of an original forward read file. Either corfasta, corfastq, corfasta1 or corfastq1 should be used.
corfastq1 <file>	Input corrected forward read fastq file. The order of reads should be same as that of an original forward read file. Either corfasta, corfastq, corfasta1 or corfastq1 should be used.
corfastq2 <file>	Input corrected reverse read fastq file. The order of reads should be same as that of an original reverse read file. Required if corfastq1 is used.
debug <prefix>	Generates debugging files with the specified prefix.
endgap	Penalize end gaps.
gext <number>	Gap extension penalty. Default: -1 (-1 for TGS reads).
gopen <number>	Gap opening penalty. Default: -6 (-1 for TGS reads).
h	Prints a help message.
location <file>	Input error location file. The name of reads in this file is not compared with that in input corrected read files. However, the order of the reads should be same in both the files. Required.
match <number>	Match score. Default: 1 (1 for TGS reads).
mismatch <number>	Mismatch penalty. Default: -4 (-1 for TGS reads).
orgfasta <file>	Input original single-end fasta file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfasta1 <file>	Input original forward read fasta file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfasta2 <file>	Input original reverse read fasta file. Required if orgfasta1 is used.
orgfastq <file>	Input original single-end read fastq file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfastq1 <file>	Input original forward read fastq file. Either orgfasta, orgfastq, orgfasta1 or orgfastq1 should be used.
orgfastq2 <file>	Input original reverse read fastq file. Required if orgfastq1 is used.

pacbio	PacBio input reads.
ref <file>	Input error-free single-end fasta file. The order of reads should be same as that of an original forward read file. Either ref or reffasta1 should be used.
reffasta1 <file>	Input error-free forward fasta file. The order of reads should be same as that of an original forward read file. Either ref or reffasta1 should be used.
reffasta2 <file>	Input error-free reverse fasta file. The order of reads should be same as that of an original reverse read file. Required if reffasta1 is used.

3.5.2. Output reports

See 3.4.2.

3.6. fill-missed-reads.fasta.common

Fills missing reads in a corrected fasta file by copying them from an input precorrection read file and writes all the reads into an output fasta file.

Option	Description
h	Prints a help message.
corfasta <file>	Input corrected fasta file. Some reads in the file may be missing. Required.
orgfastq <file>	Input original fastq file. This file should contain all the reads missing in the corrected fasta file. Required.
outfasta <file>	Output fasta file. Required.

3.7. fill-missed-reads.fastq.common

Fills missing reads in a corrected fastq file by copying them from an input precorrection read file and writes all the reads into an output fastq file.

Option	Description
h	Prints a help message.
corfastq <file>	Input corrected fastq file. Some reads in the file may be missing. Required.
orgfastq <file>	Input original fastq file. This file should contain all the reads missing in the corrected fasta file. Required.
outfastq <file>	Output fastq file. Required.

3.8. generate-error-free-reads.dna

Generates error-free reads using an error location file. It checks where each read originates and takes that parts from a reference sequence.

Option	Description
h	Prints a help message.
location <file>	Input error location file. Required.
offset <33 or 64>	Quality score offset for an output file. If the value is 33 (64), all the quality scores are filled with "I" ("h"). Default: 33.
prefix <string>	Output file name prefix. Required.
ref1 <file>	Input fasta file for the first reference sequence Ref 1. Required.
ref2 <file>	Input fasta file for the second reference sequence Ref 2. Required if input reads came from two reference sequences (i.e. Ref 1 and Ref 2).

3.9. generate-map.fasta.common

Generates a map file that show how many reads the same name each read in the original file has.

Option	Description
h	Prints a help message.
corfasta <file>	Input corrected fasta file. Required.
orgfastq <file>	Input original fastq file. Required.
outmap <file>	Output map file. It has two columns; the first one is the read name and the second one is the number of occurrences of the read in corfasta. Required.

3.10. generate-map.fastq.common

Generates a map file that show how many reads the same name each read in the original file has.

Option	Description
h	Prints a help message.
corfastq <file>	Input corrected fastq file. Required.
orgfastq <file>	Input original fastq file. Required.
outmap <file>	Output map file. It has two columns; the first one is the read name and the second one is the number of occurrences of the read in corfastq. Required.

3.11. info2location.dna

Converts an info file generated by pIRS into an error location file.

Option	Description
h	Prints a help message.
info <file>	Input pIRS info file. Required.
location <file>	Input error location file. Required.
q1 <file>	Input forward fastq file. Required.
q2 <file>	Input reverse fastq file. Required.

3.12. modify-sam.common

Converts "=" or "X" in CIGAR strings in a input SAM file to "M"s.

Option	Description
h	Prints a help message.
in <file>	Input SAM file. Required.
out <file>	Output SAM file. Required.

3.13. remove-heterozygosity-from-location.common

Compare substitution errors in the input location file with heterozygous alleles in the input VCF file, and remove substitution errors that happened due to heterozygosities.

Option	Description
h	Prints a help message.
chr <string>	Chromosome that will be processed. Required.
location <file>	Input location file. Required.
vcf <file>	Input VCF file. Required.
out <file>	Output location file. Required.

3.14. rename-fastq.common

Changes read names in a fastq file with those in another file.

Option	Description
h	Prints a help message.
infile <file>	Input fastq file to be renamed. Required.
namefastq <file>	Input fastq file that has correct read names. The order of reads in this file should be same as those in the input infile file. Required.
outfile <file>	Output fastq file. Required.

3.15. rename-fastq.lsc

Remove postfix in read names in a LSC output file.

Option	Description
h	Prints a help message.
infile <file>	Input fastq file to be renamed. Required.
namefastq <file>	Input fastq file that has correct read names. The order of reads in this file should be same as those in the input infile file. Required.
outfile <file>	Output fastq file. Required.

3.16. rename-fastq.pbcr

Remove postfix in read names in a PBcR output file.

Option	Description
h	Prints a help message.
infile <file>	Input fastq file to be renamed. Required.
namefastq <file>	Input fastq file that has correct read names. The order of reads in this file should be same as those in the input infile file. Required.
outfile <file>	Output fastq file. Required.

3.17. rename-fasta.common.proovread

Remove postfix in read names in a Proovread output file.

Option	Description
h	Prints a help message.
infasta <file>	Input fasta file to be renamed. Required.
namefastq <file>	Input fastq file that has correct read names. The order of reads in this file should be same as those in the input infasta file. Required.
outfasta <file>	Output fasta file. Required.

3.18. rename-fastq.common

Changes read names in a fastq file with those in another file.

Option	Description
h	Prints a help message.
infastq <file>	Input fastq file to be renamed. Required.
namefastq <file>	Input fastq file that has correct read names. The order of reads in this file should be same as those in the infastq file. Required.
outfastq <file>	Output fastq file. Required.

3.19. reorder-fasta.common

Reorders reads in a fasta file to the same order in another file.

Option	Description
h	Prints a help message.
infasta <file>	Input fasta file to be reordered. Required.
orgfastq <file>	Input fastq file that has a correct read order. Reads in the input fasta file are reordered using the read order in this file. Required.
outfasta <file>	Output fasta file. Required.
tmp <dir>	Temporary directory name used internally for sorting. Default: system default directory.

3.20. reorder-fastq.common

Reorders reads in a fastq file to the same order in another file.

Option	Description
h	Prints a help message.
infastq <file>	Input fastq file to be reordered. Required.
orgfastq <file>	Input fastq file that has a correct read order. Reads in the input fasta file are reordered using the read order in this file. Required.
outfastq <file>	Output fastq file. Required.
tmp <dir>	Temporary directory name used internally for sorting. Default: system default directory.

3.21. similarity-bam.common

Calculate percent similarity of an input BAM file.

Option	Description
h	Prints a help message.
bam <file>	Input BAM file. Required.
fasta <file>	Input fasta file with which an input BAM file is generated. Either fasta or fastq should be used.
fastq <file>	Input fastq file with which an input BAM file is generated. Either fasta or fastq should be used.

3.22. simngs2location.rna

Finds errors that simNGS adds to error-free reads that are generated from BEERS.

Option	Description
errfastq <file>	Input fastq file from simNGS. The reads in the file have errors. Required.
errfreefasta <file>	Input fasta file from BEERS. The reads in the file have no error. Required.
gext <number>	Gap extension penalty. Default: -4.
gopen <number>	Gap opening penalty. Default: -11.
h	Prints a help message.
match <number>	Match score. Default: 4.
mismatch <number>	Mismatch penalty. Default: -1.
prefix <string>	Output file name prefix. Required.

3.23. split-ab.common

Splits reads according to the reference sequence from which they originate (i.e. Ref 1 or Ref 2).

Option	Description
1 <file>	Input forward read file. Required.
2 <file>	Input reverse read file. Required.
format <fasta fastq>	Input read file format. Required.
h	Prints a help message.
location <file>	Input error location file. Required.
prefix <string>	Output file name prefix. Required.

3.24. unaligned2sam.common

Compares an input SAM file with input fastq files, finds unaligned reads, and adds the unaligned reads to the input SAM file.

Option	Description
fastq1	Input forward fastq file. Required.
fastq2	Input reverse fastq file. Required.
genome <1 or 2>	If reads came from two reference sequences, only reads that were sampled from the specified genome will be compared. Required.
h	Prints a help message.
location <file>	Input error location file. Required.
prefix <string>	Output file name prefix. Required.
ref <file>	Input reference fasta file. Required.
sam <file>	Input SAM file. Required.
samtools <file>	SAMtools binary. Required.
tmp <dir>	Temporary directory name used internally for sorting. Default: system default directory.

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