Single Document Summarization Experiment - Long document

1 introduction

We compared long document summarization models fine-tuned on dataset(s) for text summarization task available on Hugging-Face for Longformer and LongT5, both with maximum input length of 16384 words. We denoted each fine-tuned model with Ml_x. Automatic evaluations using ROUGE-1, ROUGE-2, ROUGE-3, ROUGE-L, CHRF-1, Meteor, and BertScore was carried out on each Ml_x generated summary with respect to the reference summary. And executed factual consistency check with the reference as evidence and the generated summary as claim.
The following are brief description of the fine-tuned models. The parameters of each fine-tuned model can be found in the dedicated github repository (Training-Parameters).

- Ml_1 **- LED-large**: allenai/led-large-16384-arxiv, Longformer large fine-tuned on the arXiv dataset. We use the PyTorch implementation of Hugging-Face Transformers library for Conditional Generation to run the document samples on this model.
- Ml_2 **- LED-base**: pszemraj/led-base-16384-finetuned-booksum, Longformer base fine-tuned on the booksum dataset. We use the PyTorch implementation of Hugging-Face Transformers library for Conditional Generation to run the document samples on this model.
- Ml_3 **- LED-large**: patrickvonplaten/led-large-16384-pubmed, Longformer large fine-tuned on the pubmed dataset. We use the PyTorch implementation of Hugging-Face Transformers library for Conditional Generation to run the document samples on this model.
- Ml_4 **- distil-LED-large**: HHousen/distil-led-large-cnn-16384, Longformer initialized from sshleifer/distilBART-cnn-12-6; BART large pretrained weight fine-tuned with cnn dataset for a 12 layer encoder and 6 layer decoder model. Position embedding matrix was copied 16 times in other to process 16K tokens. We use the PyTorch implementation of Hugging-Face library Transformers for Conditional Generation to run the document samples on this model.
- Ml_5 **- LED-large**: pszemraj/led-large-book-summary, Longformer encoder and decoder large fine-tuned on the booksum dataset. We use the PyTorch implementation of Hugging-Face Transformers library for Conditional Generation to run the document samples on this model.
- Ml_6 **- LongT5-base**:
pszemraj/long-t5-tglobal-base-16384-book-summary, LongT5 base fine-tuned on the booksum dataset. We use the PyTorch implementation of pipeline for summarization in Hugging-Face Transformers library to run the document samples on this model.
- Ml_7 **- LongT5-large**: Blaise-g/longt5-tglobal-large-sumpubmed, LongT5 large fine-tuned on the pubmed dataset. We use the PyTorch implementation of pipeline for summarization in Hugging-Face Transformers library to run the document samples on this model.

1.1 Long document summarization result

Table 1 report the evaluation of Example-long-document 1 on ROUGE-1, ROUGE-2, ROUGE-3, ROUGE-L, CHRF-1, Meteor, BertScore metrics, and Factual consistency ('Y'). In bold is the top 2 score for each metric and the minimum factual consistent fine-tuned model.

- Ml_1 and Ml_3, generates better summaries for documents in the same domain with the dataset on which they were fine-tuned.
- Ml_1, Ml_2, Ml_3, Ml_4 and Ml_5, highlight the sentence-level separator ($< /s >$, $< s >$) in the generated summary, as such recalls the need for a more refined generated summary or the use of post-processing methods. The sentence-level separators were eliminated before the automatic evaluation were executed.
- Ml_1, out performance other fine-tuned model on ROUGE-1, ROUGE-2,ROUGE-3, ROUGE-L and BertScore in Example-Long-document 1.
- Ml_1 and Ml_6, is an ideal example of comparable models because they have the same number of layers and are fine-tune on the same dataset document domain. with Ml_2 outperforming Ml_6 on ROUGE-2,
ROUGE-3, and Metoer for Example-Long-document 1.

2 Sampled document

Example-long-document 1: Given the following source document and reference from the arxiv dataset, Table 1 show result of Evaluation of Example-long-document 1. In bold is the top 2 score for each metric, and the minimum factual consistent fine-tuned model:

- **Source Document** -
additive models @xcite provide an important family of models for semiparametric regression or classification . some reasons for the success of additive models are their increased flexibility when compared to linear or generalized linear models and their increased interpretability when compared to fully nonparametric models . it is well - known that good estimators in additive models are in general less prone to the curse of high dimensionality than good estimators in fully nonparametric models . many examples of such estimators belong to the large class of regularized kernel based methods over a reproducing kernel hilbert space @xmath0 , see e.g. @xcite . in the last years many interesting results on learning rates of regularized kernel based models for additive models have been published when the focus is on sparsity and when the classical least squares loss function is used , see e.g. @xcite , @xcite , @xcite , @xcite , @xcite , @xcite and the references therein . of course , the least squares loss function is differentiable and has many nice mathematical properties , but it is only locally lipschitz continuous and therefore regularized kernel based methods based on this loss function typically suffer on bad statistical robustness properties , even if the kernel is bounded . this is in sharp contrast to kernel methods based on a lipschitz continuous loss function and on a bounded loss function , where results on upper bounds for the maxbias bias and on a bounded influence function are known , see e.g. @xcite for the general case and @xcite for additive models . therefore , we will here consider the case of regularized kernel based methods based on a general convex and lipschitz continuous loss function , on a general kernel , and on the classical regularizing term @xmath1 for some @xmath2 which is a smoothness penalty but not a sparsity penalty , see e.g. @xcite . such regularized kernel based methods are now often called support vector machines (svms) , although the notation was historically used for such methods based on the special hinge loss function and for special kernels only , we refer to @xcite . in this paper we address the open question , whether an svm with an additive kernel can provide a substantially better learning rate in high dimensions than an svm with a general kernel , say a classical gaussian rbf kernel , if the assumption of an additive model is satisfied . our leading example covers learning rates for quantile regression based on the lipschitz continuous but non - differentiable pinball loss function , which is also called check function in the literature , see e.g. @xcite and @xcite for parametric quantile regression and @xcite , @xcite , and @xcite for kernel based quantile regression . we will not address the question how to check whether the assumption of an additive model is satisfied because this would be a

topic of a paper of its own . of course , a practical approach might be to fit both models and compare their risks evaluated for test data . for the same reason we will also not cover sparsity . consistency of support vector machines generated by additive kernels for additive models was considered in @xcite . in this paper we establish learning rates for these algorithms . let us recall the framework with a complete separable metric space @xmath3 as the input space and a closed subset @xmath4 of @xmath5 as the output space . a borel probability measure @xmath6 on @xmath7 is used to model the learning problem and an independent and identically distributed sample @xmath8 is drawn according to @xmath6 for learning . a loss function @xmath9 is used to measure the quality of a prediction function @xmath10 by the local error @xmath11 . _ throughout the paper we assume that @xmath12 is measurable , @xmath13 , convex with respect to the third variable , and uniformly lipschitz continuous satisfying @xmath14 with a finite constant @xmath15 . _ support vector machines (svms) considered here are kernel - based regularization schemes in a reproducing kernel hilbert space (rkhs) @xmath0 generated by a mercer kernel @xmath16 . with a shifted loss function @xmath17 introduced for dealing even with heavy - tailed distributions as @xmath18 , they take the form @xmath19 where for a general borel measure @xmath20 on @xmath21 , the function @xmath22 is defined by @xmath23 where @xmath24 is a regularization parameter . the idea to shift a loss function has a long history , see e.g. @xcite in the context of m - estimators . it was shown in @xcite that @xmath22 is also a minimizer of the following optimization problem involving the original loss function @xmath12 if a minimizer exists : @xmath25 the additive model we consider consists of the _ input space decomposition _ @xmath26 with each @xmath27 a complete separable metric space and a _ hypothesis space _ @xmath28 where @xmath29 is a set of functions @xmath30 each of which is also identified as a map @xmath31 from @xmath3 to @xmath5 . hence the functions from @xmath32 take the additive form @xmath33 . we mention , that there is strictly speaking a notational problem here , because in the previous formula each quantity @xmath34 is an element of the set @xmath35 which is a subset of the full input space @xmath36 , @xmath37 , whereas in the definition of sample @xmath8 each quantity @xmath38 is an element of the full input space @xmath36 , where @xmath39 . because these notations will only be used in different places and because we do not expect any misunderstandings , we think this notation is easier and more intuitive than specifying these quantities with different symbols . the additive kernel @xmath40 is defined in terms of mercer kernels @xmath41 on @xmath27 as @xmath42 it generates an rkhs @xmath0 which can be written in terms of the rkhs @xmath43 generated by @xmath41 on @xmath27 corresponding to the form ([additive]) as @xmath44 with norm given by @xmath45 the norm of @xmath46 satisfies @xmath47 to illustrate advantages of additive models , we provide two examples of comparing additive with product kernels . the first example deals with gaussian rbf kernels . all proofs will be given in section [proofsection] . [gaussadd] let @xmath48 , @xmath49] and 50^2.] let @xmath51 and @xmath52.]] the additive kernel @xmath53 is given by @xmath54 furthermore , the product kernel @xmath55 is the standard gaussian kernel given by @xmath56 define a gaussian function @xmath57 on 58^2] depending only on one variable by @xmath59 then @xmath60 but @xmath61 where @xmath62 denotes the rkhs generated by the standard gaussian rbf kernel @xmath63 . the second example is about sobolev kernels . [sobolvadd] let @xmath64 , @xmath65] and 58^s.] let @xmath66 : $= bigl\{u \in l_2([0,1]); d^\alpha u \in l_2([0,1]) \text{ for all } |\alpha| \le 1\bigr\}$]] be the sobolev space consisting of all square integrable univariate functions whose derivative is also square integrable . it is an rkhs with a mercer kernel @xmath67 defined on $68^{\ 2}$] . if we take all the mercer kernels @xmath69 to be @xmath67 , then @xmath70] for each @xmath71 . the additive kernel @xmath72 is also a mercer kernel and defines an rkhs @xmath73}.]] however , the multivariate sobolev space 74^s)] , consisting of all square integrable functions whose partial derivatives are all square integrable , contains discontinuous functions and is not an rkhs . denote the marginal distribution of @xmath6 on @xmath27 as @xmath75 . under the assumption that @xmath76 for each @xmath71 and that @xmath43 is dense in @xmath29 in the @xmath77-metric , it was proved in @xcite that @xmath78

in probability as long as @xmath79 satisfies @xmath80 and @xmath81 . the rest of the paper has the following structure . section [ratessection] contains our main results on learning rates for svms based on additive kernels . learning rates for quantile regression are treated as important special cases . section [comparisonsection] contains a comparison of our results with other learning rates published recently . section [proofsection] contains all the proofs and some results which can be interesting in their own . in this paper we provide some learning rates for the support vector machines generated by additive kernels for additive models which helps improve the quantitative understanding presented in @xcite . the rates are about asymptotic behaviors of the excess risk @xmath82 and take the form @xmath83 with @xmath84 . they will be stated under three kinds of conditions involving the hypothesis space @xmath0 , the measure @xmath6 , the loss @xmath12 , and the choice of the regularization parameter @xmath85 . the first condition is about the approximation ability of the hypothesis space @xmath0 . since the output function @xmath19 is from the hypothesis space , the learning rates of the learning algorithm depend on the approximation ability of the hypothesis space @xmath0 with respect to the optimal risk @xmath86 measured by the following approximation error . [defapprox] the approximation error of the triple @xmath87 is defined as @xmath88 to estimate the approximation error , we make an assumption about the minimizer of the risk @xmath89 for each @xmath90 , define the integral operator @xmath91 associated with the kernel @xmath41 by @xmath92 we mention that @xmath93 is a compact and positive operator on @xmath94 . hence we can find its normalized eigenpairs @xmath95 such that @xmath96 is an orthonormal basis of @xmath94 and @xmath97 as @xmath98 . fix @xmath99 . then we can define the @xmath100-th power @xmath101 of @xmath93 by @xmath102 this is a positive and bounded operator and its range is well - defined . the assumption @xmath103 means @xmath104 lies in this range . [assumption1] we assume @xmath105 and @xmath106 where for some @xmath107 and each @xmath108 , @xmath109 is a function of the form @xmath110 with some @xmath111 . the case @xmath112 of assumption [assumption1] means each @xmath113 lies in the rkhs @xmath43 . a standard condition in the literature (e.g. , @xcite) for achieving decays of the form @xmath114 for the approximation error ([approxerrordef]) is @xmath115 with some @xmath116 . here the operator @xmath117 is defined by @xmath118 in general , this can not be written in an additive form . however , the hypothesis space ([additive]) takes an additive form @xmath119 . so it is natural for us to impose an additive expression @xmath120 for the target function @xmath121 with the component functions @xmath113 satisfying the power condition @xmath110 . the above natural assumption leads to a technical difficulty in estimating the approximation error : the function @xmath113 has no direct connection to the marginal distribution @xmath122 projected onto @xmath27 , hence existing methods in the literature (e.g. , @xcite) can not be applied directly . note that on the product space @xmath123 , there is no natural probability measure projected from @xmath6 , and the risk on @xmath124 is not defined . our idea to overcome the difficulty is to introduce an intermediate function @xmath125 . it may not minimize a risk (which is not even defined) . however , it approximates the component function @xmath113 well . when we add up such functions @xmath126 , we get a good approximation of the target function @xmath121 , and thereby a good estimate of the approximation error . this is the first novelty of the paper . [approxerrorthm] under assumption [assumption1] , we have @xmath127 where @xmath128 is the constant given by @xmath129 the second condition for our learning rates is about the capacity of the hypothesis space measured by @xmath130-empirical covering numbers . let @xmath131 be a set of functions on @xmath21 and @xmath132 for every @xmath133 the * covering number of @xmath131 * with respect to the empirical metric @xmath134 , given by @xmath135 is defined as @xmath136 and the * @xmath130-empirical covering number * of @xmath137 is defined as @xmath138 [assumption2] we assume @xmath139 and that for some @xmath140 , @xmath141 and every @xmath142 , the @xmath130-empirical covering number of the unit ball of @xmath43 satisfies @xmath143 the second novelty of this paper is to observe that the additive nature of the hypothesis space

yields the following nice bound with a dimension - independent power exponent for the covering numbers of the balls of the hypothesis space @xmath0 , to be proved in section [samplesection] . [capacitythm] under assumption [assumption2] , for any @xmath144 and @xmath145 , we have @xmath146 the bound for the covering numbers stated in theorem [capacitythm] is special : the power @xmath147 is independent of the number @xmath148 of the components in the additive model . it is well - known @xcite in the literature of function spaces that the covering numbers of balls of the sobolev space @xmath149 on the cube 150^s] of the euclidean space @xmath151 with regularity index @xmath152 has the following asymptotic behavior with @xmath153 : @xmath154 here the power @xmath155 depends linearly on the dimension @xmath148 . similar dimension - dependent bounds for the covering numbers of the rkhss associated with gaussian rbf - kernels can be found in @xcite . the special bound in theorem [capacitythm] demonstrates an advantage of the additive model in terms of capacity of the additive hypothesis space . the third condition for our learning rates is about the noise level in the measure @xmath6 with respect to the hypothesis space . before stating the general condition , we consider a special case for quantile regression , to illustrate our general results . let @xmath156 be a quantile parameter . the quantile regression function @xmath157 is defined by its value @xmath158 to be a @xmath159-quantile of @xmath160 , i.e. , a value @xmath161 satisfying @xmath162 the regularization scheme for quantile regression considered here takes the form ([algor]) with the loss function @xmath12 given by the pinball loss as @xmath163 a noise condition on @xmath6 for quantile regression is defined in @xcite as follows . to this end , let @xmath164 be a probability measure on @xmath165 and @xmath166 . then a real number @xmath167 is called @xmath159-quantile of @xmath164 , if and only if @xmath167 belongs to the set $168\big) \geq \tau$ and $q\big([t,\infty)\big) \geq 1-\tau\big\}$.]] it is well - known that @xmath169 is a compact interval . [noisecond] let @xmath166 . 1 . a probability measure @xmath164 on @xmath165 is said to have a * @xmath159-quantile of type
@xmath170 * , if there exist a @xmath159-quantile @xmath171 and a constant @xmath172 such that , for all @xmath173] , we have @xmath174 2 . let @xmath175] . we say that a probability measure @xmath20 on @xmath176 has a * @xmath159-quantile of @xmath177-average type @xmath170 * if the conditional probability measure
@xmath178 has @xmath179-almost surely a @xmath159-quantile of type @xmath170 and the function @xmath180 where @xmath181 is the constant defined in part (1) , satisfies @xmath182 . one can show that a distribution @xmath164 having a @xmath159-quantile of type @xmath170 has a unique @xmath159-quantile @xmath183 . moreover , if
@xmath164 has a lebesgue density @xmath184 then @xmath164 has a @xmath159-quantile of type @xmath170 if @xmath184 is bounded away from zero on @xmath185] since we can use @xmath186}] in ([tauquantileoftype2formula]) . this assumption is general enough to cover many distributions used in parametric statistics such as gaussian , student s @xmath187 , and logistic distributions (with @xmath188) , gamma and log - normal distributions (with @xmath189) , and uniform and beta distributions (with @xmath190]) . the following theorem , to be proved in section [proofsection] , gives a learning rate for the regularization scheme ([algor]) in the special case of quantile regression . [quantilethm] suppose that @xmath191 almost surely for some constant @xmath192 , and that each kernel @xmath41 is @xmath193 with @xmath194 for some @xmath195 . if assumption [assumption1] holds with @xmath112 and @xmath6 has a @xmath159-quantile of @xmath177-average type @xmath170 for some @xmath196], then by taking @xmath197, for any @xmath198 and @xmath199, with confidence at least @xmath200 we have @xmath201 where
@xmath202 is a constant independent of @xmath203 and @xmath204 and @xmath205 please note that the exponent @xmath206 given by ([quantilerates2]) for the learning rate in ([quantilerates]) is independent of the quantile level @xmath159 , of the number @xmath148 of additive components in @xmath207 , and of the dimensions @xmath208 and @xmath209 further note that @xmath210 , if @xmath211 , and @xmath212 if @xmath213 . because @xmath214 can be arbitrarily close to @xmath215

, the learning rate , which is independent of the dimension @xmath216 and given by theorem [quantilethm] , is close to @xmath217 for large values of @xmath177 and is close to @xmath218 or better , if @xmath211 . to state our general learning rates , we need an assumption on a _ variance - expectation bound _ which is similar to definition [noisecond] in the special case of quantile regression . [assumption3] we assume that there exist an exponent @xmath219] and a positive constant @xmath220 such that @xmath221 assumption [assumption3] always holds true for
@xmath222 . if the triple @xmath223 satisfies some conditions , the exponent @xmath224 can be larger . for example , when @xmath12 is the pinball loss ([pinloss]) and @xmath6 has a @xmath159-quantile of @xmath177-average type @xmath225 for some @xmath196] and @xmath226 as defined in @xcite , then @xmath227 . [mainratesthm] suppose that @xmath228 is bounded by a constant @xmath229 almost surely . under assumptions [assumption1] to [assumption3] , if we take @xmath198 and @xmath230 for some @xmath231 , then for any @xmath232 , with confidence at least @xmath200 we have @xmath233 where @xmath234 is given by @xmath235 and
@xmath202 is constant independent of @xmath203 or @xmath204 (to be given explicitly in the proof) . we now add some theoretical and numerical comparisons on the goodness of our learning rates with those from the literature . as already mentioned in the introduction , some reasons for the popularity of additive models are flexibility , increased interpretability , and (often) a reduced proneness of the curse of high dimensions . hence it is important to check , whether the learning rate given in theorem [mainratesthm] under the assumption of an additive model favourably compares to (essentially) optimal learning rates without this assumption . in other words , we need to demonstrate that the main goal of this paper is achieved by theorem [quantilethm] and theorem [mainratesthm] , i.e. that an svm based on an additive kernel can provide a substantially better learning rate in high dimensions than an svm with a general kernel , say a classical gaussian rbf kernel , provided the assumption of an additive model is satisfied . our learning rate in theorem [quantilethm] is new and optimal in the literature of svm for quantile regression . most learning rates in the literature of svm for quantile regression are given for projected output functions @xmath236 , while it is well known that projections improve learning rates @xcite . here the projection operator @xmath237 is defined for any measurable function @xmath10 by @xmath238 sometimes this is called clipping . such results are given in @xcite . for example , under the assumptions that @xmath6 has a @xmath159-quantile of @xmath177-average type @xmath170 , the approximation error condition ([approxerrorb]) is satisfied for some @xmath239 , and that for some constants @xmath240 , the sequence of eigenvalues @xmath241 of the integral operator @xmath117 satisfies @xmath242 for every @xmath243 , it was shown in @xcite that with confidence at least @xmath200 , @xmath244 where @xmath245 here the parameter @xmath246 measures the capacity of the rkhs @xmath247 and it plays a similar role as half of the parameter @xmath147 in assumption 2 . for a @xmath193 kernel and @xmath112 , one can choose @xmath246 and @xmath147 to be arbitrarily small and the above power index @xmath248 can be taken as @xmath249 . the learning rate in theorem [quantilethm] may be improved by relaxing assumption 1 to a sobolev smoothness condition for @xmath121 and a regularity condition for the marginal distribution @xmath250 . for example , one may use a gaussian kernel @xmath251 depending on the sample size @xmath203 and @xcite achieve the approximation error condition ([approxerrorb]) for some @xmath252 . this is done for quantile regression in @xcite . since we are mainly interested in additive models , we shall not discuss such an extension . [gaussmore] let @xmath48 , @xmath49] and 50^2.] let @xmath51 and the additive kernel @xmath72 be given by ([gaussaddform]) with @xmath253 in example [gaussadd] as @xmath52.]] if the function @xmath121 is given by ([gaussfcn]) , @xmath191 almost surely for some constant @xmath192 , and @xmath6 has a @xmath159-quantile of @xmath177-average type @xmath170 for some @xmath196] , then by taking @xmath197 , for any @xmath145 and @xmath199 , ([quantilerates]) holds with confidence at least @xmath200 . it is unknown whether the above learning rate can be derived by existing approaches in the literature (e.g. @xcite) even after

projection . note that the kernel in the above example is independent of the sample size . it would be interesting to see whether there exists some @xmath99 such that the function @xmath57 defined by ([gaussfcn]) lies in the range of the operator @xmath254 . the existence of such a positive index would lead to the approximation error condition ([approxerrorb]) , see @xcite . let us now add some numerical comparisons on the goodness of our learning rates given by theorem [mainratesthm] with those given by @xcite . their corollary 4.12 gives (essentially) minmax optimal learning rates for (clipped) svms in the context of nonparametric quantile regression using one gaussian rbf kernel on the whole input space under appropriate smoothness assumptions of the target function . let us consider the case that the distribution @xmath6 has a @xmath159-quantile of @xmath177-average type @xmath170 , where @xmath255 , and assume that both corollary 4.12 in @xcite and our theorem [mainratesthm] are applicable . i.e. , we assume in particular that @xmath6 is a probability measure on @xmath256] and that the marginal distribution @xmath257 has a lebesgue density @xmath258 for some @xmath259 . furthermore , suppose that the optimal decision function @xmath260 has (to make theorem [mainratesthm] applicable with @xmath261]) the additive structure @xmath207 with each @xmath104 as stated in assumption [assumption1] , where @xmath262 and @xmath263 , with minimal risk @xmath86 and additionally fulfills (to make corollary 4.12 in @xcite applicable) @xmath264 where @xmath265] and @xmath266 denotes a besov space with smoothness parameter @xmath267 . the intuitive meaning of @xmath248 is , that increasing values of @xmath248 correspond to increased smoothness . we refer to (* ? ? ? * and p. 44) for details on besov spaces . it is well - known that the besov space @xmath268 contains the sobolev space @xmath269 for @xmath270 , @xmath271 , and @xmath272 , and that @xmath273 . we mention that if all @xmath41 are suitably chosen wendland kernels , their reproducing kernel hilbert spaces @xmath43 are sobolev spaces , see (* ? ? ? * thm . 10.35 , p. 160) . furthermore , we use the same sequence of regularizing parameters as in (* ? ? ? 4.9 , cor . 4.12) , i.e. , @xmath274 where @xmath275 , @xmath276 , @xmath277] , and @xmath278 is some user - defined positive constant independent of @xmath279 . for reasons of simplicity , let us fix @xmath280 . then (* ? ? ? 4.12) gives learning rates for the risk of svms for @xmath159-quantile regression , if a single gaussian rbf - kernel on @xmath281 is used for @xmath159-quantile functions of @xmath177-average type @xmath170 with @xmath255 , which are of order @xmath282 hence the learning rate in theorem [quantilethm] is better than the one in (* ? ? ? 4.12) in this situation , if @xmath283 provided the assumption of the additive model is valid . table [table1] lists the values of @xmath284 from ([explicitratescz2]) for some finite values of the dimension @xmath216 , where @xmath285 . all of these values of @xmath284 are positive with the exceptions if @xmath286 or @xmath287 . this is in contrast to the corresponding exponent in the learning rate by (* ? ? * cor . 4.12) , because @xmath288 table [table2] and figures [figure1] to [figure2] give additional information on the limit @xmath289 . of course , higher values of the exponent indicates faster rates of convergence . it is obvious , that an svm based on an additive kernel has a significantly faster rate of convergence in higher dimensions @xmath216 compared to svm based on a single gaussian rbf kernel defined on the whole input space , of course under the assumption that the additive model is valid . the figures seem to indicate that our learning rate from theorem [mainratesthm] is probably not optimal for small dimensions . however , the main focus of the present paper is on high dimensions . .[table1] the table lists the limits of the exponents @xmath290 from (* ? ? ? * cor . 4.12) and @xmath291 from theorem [mainratesthm] , respectively , if the regularizing parameter @xmath292 is chosen in an optimal manner for the nonparametric setup , i.e. @xmath293 , with @xmath294 for @xmath295 and @xmath296 . recall that @xmath297] . [$cols =$ " $>, >, >, >$ ",]

- **Reference** -
  additive models play an important role in semiparametric statistics . this paper gives learning rates for regularized kernel based methods for additive models . these learning rates compare favourably in particular in high dimensions to recent results on optimal

learning rates for purely nonparametric regularized kernel based quantile regression using the gaussian radial basis function kernel , provided the assumption of an additive model is valid . additionally , a concrete example is presented to show that a gaussian function depending only on one variable lies in a reproducing kernel hilbert space generated by an additive gaussian kernel , but does not belong to the reproducing kernel hilbert space generated by the multivariate gaussian kernel of the same variance . * key words and phrases . * additive model , kernel , quantile regression , semiparametric , rate of convergence , support vector machine .

- **Generated summary**:

  Ml_1 - $< /s >$ additive models provide an important family of models for semiparametric regression or classification. some reasons for the success of additive models are their increased flexibility when compared to linear or generalized linear models and their increased interpretability when compared to fully nonparametric models. it is well - known that good estimators in additive models are in general less prone to the curse of high dimensionality than good estimators in fully nonparametric models. many examples of such estimators belong to the large class of regularized kernel based methods over a reproducing kernel hilbert space. in this paper we address the open question, whether an svm with an additive kernel can provide a substantially better learning rate in high dimensions than an svm with a general kernel, say a classical gaussian rbf kernel, if the assumption of an additive model is satisfied. our leading example covers learning rates for quantile regression based on the lipschitz continuous but non - differentiable pinball loss function, which is also called check function in the literature. $< /s >$

  Ml_2 - $< /s >< s >$ additive models @xcite provide an important family of models for semiparametric regression or classification. Some of the most important reasons for the success of additive models are their increased flexibility when compared to linear or generalized linear models and their increased interpretability when compared with fully nonparametric models. For example, learning rates of regularized kernel based methods based on a general convex and lipschitz continuous loss function typically suffer on bad statistical robustness properties, even if the kernel is bounded. In addition, the learning rate of a svm based on an additive kernel can provide a substantially better learning rate in high dimensions than an svm with a general kernel, say a classical gaussian rbf kernel, if the assumption of an additive model is satisfied. In this paper, we present two examples of comparing additive models for learning rates with those from the literature. The first example deals with the learning rates given by theorem [mainratesthm] with the assumption that the additive model was valid. In the second example, we show how to compare additive models with product kernels. In the first example we show that the SVM based on the additive kernel has a significantly faster learning rate than the svm using the general kernel. In addition to this, we add some theoretical and numerical comparisons on the goodness of learning rates for additive models. We show how much better learning rates can be obtained by comparing additive model learning rates to those given by the literature. We also show how good learning rates are achieved by using the additive models. The learning rates shown in this paper depend on the ability of the Svm to provide the best learning rate for high dimensions. The learning rate shown in the paper depends on the accuracy of the model and on the performance of the machine. We then show how well the model can improve learning rates in high dimensionality. The best learning rates come from the ability to estimate learning rates. The most important learning rate is obtained by using a generalization model of the sobolev space, which is described in section [proofsection]. The most interesting learning rates we present here are those obtained by the use of a generalizing model. The generalization is that learning rates do not depend on accuracy, but rather on the capacity of the system. In other words, they do not rely on accuracy. In fact, they rely on the fact that the model is valid and that there is no need to worry about accuracy. This is because the model does not require accuracy.$< /s >$

Ml_3 - $< /s >< s >< s >< s >$ regularized kernel based methods based on a general convex and lipschitz continuous loss function and a general kernel are often called support vector machines (svms). in this paper we address the open question of whether an svm with an additive kernel can provide a substantially better learning rate in high dimensions than an svms with a classical gaussian rbf kernel, if the assumption of an additive model is satisfied. our leading example covers learning rates for quantile regression based on the lipschitzer continuous but non - differentiable pinball loss function, which is also called check function in the literature. to illustrate advantages of additive models , we provide two examples of comparing additive with product kernels. in the first example the learning rates are asymptotic behaviors of the excess risk with the form @xcite and in the second example they are about the learning rate for the regularization scheme ([algor]). $< /s >$

Ml_4 - $< /s >$ In this paper, we show that an additive model can provide a substantially better learning rate in high dimensions than an svm with a general kernel. We also show that the learning rate is better than that of a linear model. The study is based on the assumption that the model is valid. We conclude that this is true and that it can be used to improve learning rates.$< /s >$

Ml_5 - $< /s >< s >< s >< s >$In this paper, the authors evaluate the performance of two different kinds of machine learning algorithms: additive and non-additive. additive models are more flexible and more interpretable than fully nonparametric models. They also have a tendency to be less prone to the "curse of high dimensionality" than those based on linear or generalized linear models. Thus, our goal in this paper is to prove that an svm with an additive kernel can provide a substantially better learning rate in high dimensions than a general kernel over a limited space if the assumption that the model is based on an additive model is satisfied. The authors perform several experiments to determine the sensitivity and learning rate of their new methods. They use a loss function of the least squares solution to predict the likelihood of an outcome at a given point in time. Finally, they perform an experiment comparing the sensitivity of their additive model to that of a conventional Gaussian rbf kernel. The authors note that there is a technical difficulty in estimating the error due to the fact that the GRK has no direct connection to the marginal distribution, but they nevertheless obtain a good estimate of the error from several independent measures.$< /s >$

Model	ROUGE-1	ROUGE-2	ROUGE-3	ROUGE-L	CHRF1	Meteor	BertScore	FactCheck
Ml_1	**0.5017**	**0.1818**	**0.0881**	**0.2207**	**0.5035**	**0.3882**	**0.8529**	1.0
Ml_2	0.3162	0.1105	0.0429	0.167	0.3204	0.3355	0.8357	**0.90**
Ml_3	0.4823	0.1643	0.0791	0.2199	0.4669	0.317	0.8456	1.0
Ml_4	0.4	0.1212	0.0306	0.22	0.2917	0.1797	0.836	1.0
Ml_5	0.3776	0.095	0.0179	0.1829	0.3998	0.2927	0.8389	**0.90**
Ml_6	0.4211	0.0993	0.0133	0.2039	0.425	0.2983	0.8368	1.0
Ml_7	**0.5038**	**0.1894**	**0.0992**	**0.2331**	**0.4933**	**0.3852**	**0.8555**	1.0

Table 1: Evaluation of Example-long-document 1.

Example-long-document 2: Given the following source document and reference from the pubmed dataset, Table 2 show result of Evaluation of Example-long-document 2. In bold is the top 2 score for each metric, and the minimum factual consistent fine-tuned model:

- **Source Document** -
  a recent systematic analysis showed that in 2011 , 314 (296 - 331) million children younger than 5 years were mildly , moderately or severely stunted and 258 (240 - 274) million were mildly , moderately or severely underweight in the developing countries . in iran a study among 752 high school girls in sistan and baluchestan showed prevalence

of 16.2% , 8.6% and 1.5% , for underweight , overweight and obesity , respectively . the prevalence of malnutrition among elementary school aged children in tehran varied from 6% to 16% . anthropometric study of elementary school students in shiraz revealed that 16% of them suffer from malnutrition and low body weight . snack should have 300 - 400 kcal energy and could provide 5 - 10 g of protein / day . nowadays , school nutrition programs are running as the national programs , world - wide . national school lunch program in the united states there are also some reports regarding school feeding programs in developing countries . in vietnam , school base program showed an improvement in nutrient intakes . in iran a national free food program (nffp) is implemented in elementary schools of deprived areas to cover all poor students . however , this program is not conducted in slums and poor areas of the big cities so many malnourished children with low socio - economic situation are not covered by nffp . although the rate of poverty in areas known as deprived is higher than other areas , many students in deprived areas are not actually poor and can afford food . hence , nutritional value of the nffp is lower than the scientific recommended snacks for this age group . furthermore , lack of variety of food packages has decreased the tendency of children toward nffp . on the other hand , the most important one is ministry of education (moe) of iran , which is responsible for selecting and providing the packages for targeted schools . the ministry of health (moh) is supervising the health situation of students and their health needs . welfare organizations , along with charities , have the indirect effect on nutritional status of students by financial support of their family . provincial governors have also the role of coordinating and supervising all activities of these organizations . parent - teacher association is a community - based institution that participates in school 's policy such as nffp . in addition to these organizations , nutritional literacy of students , their parents and teachers , is a very important issue , which could affect nutritional status of school age children . therefore , the present study was conducted with the aim of improving the nffp , so that by its resources all poor children will be covered even in big cities . moreover , all food packages were replaced by nutritious and diverse packages that were accessible for non - poor children . according to the aim of this study and multiple factors that could affect the problem , public health advocacy has been chosen as the best strategy to deal with this issue . therefore , the present study determines the effects of nutrition intervention in an advocacy process model on the prevalence of underweight in school aged children in the poor area of shiraz , iran . this interventional study has been carried out between 2009 and 2010 in shiraz , iran . this survey was approved by the research committee of shiraz university of medical sciences . in coordination with education organization of fars province two elementary schools and one middle school in the third region of the urban area of shiraz were selected randomly . in those schools all students (2897 , 7 - 13 years old) were screened based on their body mass index (bmi) by nutritionists . according to convenience method all students divided to two groups based on their economic situation ; family revenue and head of household 's job and nutrition situation ; the first group were poor and malnourished students and the other group were well nourished or well - off students . for this report , the children 's height and weight were entered into center for disease control and prevention (cdc) to calculate bmi and bmi - for - age z - scores based on cdc for diseases control and prevention and growth standards . the significance of the difference between proportions was calculated using two - tailed z - tests for independent proportions . for implementing the interventions , the advocacy process model weight was to the nearest 0.1 kg on a balance scale (model seca scale) . standing height was measured to the nearest 0.1 cm with a wall - mounted stadiometer . advocacy group formation : this step was started with stakeholder analysis and identifying the stakeholders . the team was formed with representatives of all stakeholders include ; education organization , welfare organization , deputy for health of shiraz university , food and cosmetic product supervisory office and several non - governmental organizations and charities . situation analysis : this was carried out by use of existing data such as formal report of organizations , literature review and focus group with experts . the prevalence of malnutrition and its related factors among students

was determined and weaknesses and strengths of the nffp were analyzed . accordingly , three sub - groups were established : research and evaluation , education and justification and executive group . designing the strategies : three strategies were identified ; education and justification campaign , nutritional intervention (providing nutritious , safe and diverse snacks) and networking . performing the interventions : interventions that were implementing in selected schools were providing a diverse and nutritious snack package along with nutrition education for both groups while the first group (poor and malnourished students) was utilized the package free of charge . education and justification intervention : regarding the literature review and expert opinion , an educational group affiliated with the advocacy team has prepared educational booklets about nutritional information for each level (degree) . accordingly , education of these booklets has been integrated into regular education of students and they educated and justified for better nutrition life - style . it leads the educational group to hold several meeting with the student 's parents to justify them about the project and its benefit for their children . after these meetings , parental desire for participation in the project illustrated the effectiveness of the justification meeting with them . for educate fifteen talk show programs in tv and radio , 12 published papers in the local newspaper , have implemented to mobilize the community and gain their support . healthy diet , the importance of breakfast and snack in adolescence , wrong food habits among school age children , role of the family to improve food habit of children were the main topics , in which media campaign has focused on . nutritional intervention : the snack basket of the students was replaced with traditional , nutritious and diverse foods . in general , the new snack package in average has provided 380 kcal energy , 15 g protein along with sufficient calcium and iron . low economic and malnourished children were supported by executive group affiliated with advocacy team and the rest of them prepare their snack by themselves . research and evaluation : in this step , the literacy and anthropometric indices (bmi) of students were assessed before and after the interventions . the reference for anthropometric measures was the world health organization / national center for health statistics (who / nchs) standards and the cut - offs were - two standard deviations (sd) from the mean . each student that was malnourished and poor has been taken into account for free food and nutritious snacks . demographic information , height , weight and knowledge of the students were measured by use of a validated and reliable (cronbach 's alpha was 0.61) questionnaire . this project is granted by shiraz university of medical sciences , charities and welfare organization and education organization of fars province . statistical analyses were performed using the statistical package for the social sciences (spss) software , version 17.0 (spss inc . , the results are expressed as mean sd and proportions as appropriated . in order to determine the effective variables on the malnutrition status paired t test was used to compare the end values with baseline ones in each group . in this project , the who z - score cut - offs used were as follow : using bmi - for - age z - scores ; overweight : $> +1$ sd , i.e. , z - score > 1 (equivalent to bmi 25 kg / m) , obesity : $> +2$ sd (equivalent to bmi 30 kg / m) , thinness : < 2 sd and severe thinness : < 3 sd . this interventional study has been carried out between 2009 and 2010 in shiraz , iran . this survey was approved by the research committee of shiraz university of medical sciences . in coordination with education organization of fars province two elementary schools and one middle school in the third region of the urban area of shiraz were selected randomly . in those schools all students (2897 , 7 - 13 years old) were screened based on their body mass index (bmi) by nutritionists . according to convenience method all students divided to two groups based on their economic situation ; family revenue and head of household 's job and nutrition situation ; the first group were poor and malnourished students and the other group were well nourished or well - off students . for this report , the children 's height and weight were entered into center for disease control and prevention (cdc) to calculate bmi and bmi - for - age z - scores based on cdc for diseases control and prevention and growth standards . the significance of the difference between proportions was calculated using two - tailed z - tests for independent proportions . for implementing the interventions , weight was to the nearest 0.1 kg on a balance scale (model seca scale) .

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trition intervention based on advocacy process model . according to this table there were no significant differences in the prevalence of mild , moderate and severe malnutrition among girls and boys . table 4 also shows the mean of all anthropometric indices changed significantly after intervention both among girls and boys . the pre- and post - test education assessment in both groups showed that the student 's average knowledge score has been significantly increased from 12.5 3.2 to 16.8 4.3 ($p < 0.0001$) . bmi , height and weight in non - welfare and welfare groups of school aged children separately in males and females before and after a nutrition intervention based on advocacy process model in shiraz , iran according to study 's finding the odds ratio (or) of sever thinness and thinness in non - welfare compared with welfare is 3.5 (or = 3.5 , confidence interval $[ci] = 2.5 - 3.9, p < 0.001$) . furthermore , the finding showed or of overweight and obesity in welfare compared to non - welfare is 19.3 (or = 19.3 , ci = 2.5 - 3.9 , p = 0.04) . the result of this community intervention study revealed that nutrition intervention based on advocacy program had been successful to reduce the prevalence of underweight among poor girls . this study shows determinant factor of nutritional status of school age children was their socio - economic level . according to our knowledge , this is the first study , which determines the effect of a community intervention based on advocacy process on the malnutrition indices in a big city (shiraz) in iran . the other program in iran (nffp) is specified to deprived area and is not conducted in big cities . allocating millions of dollars to nffp by government , selecting the malnourished students through an active screening system at primary and middle schools , paying attention of policy makers to student 's nutrition have provided the opportunity to combat the problem . however , negligence of under - poverty line , providing poor snacks in terms of nutritional value and lack of variety are the main defects of this program . advocacy by definition is a blending of science , ethics and politics for comprehensive approaching health issues . by using advocacy program in california among the high school students for improving their nutrition and physical activity angeles unified school district participants emphasized on nutrition classes for families as well as students in addition to other interventions . in the present study another study revealed that evaluability assessment gave stakeholders the opportunity to reflect on the project and its implementation issues . it seems that in iran , free food program among the students not only is needed in deprived areas , but also it should be performed in big cities such as shiraz . at baseline , no significant difference was founded among wealthy students between the pre- and post - nutritional status intervention . in contrast , the numbers of students who have malnutrition decreased from 44% to 39.4% , which was identified as a significant among impecunious girls students . there was also a significant increase in the proportion of children with bmi that was normal for age (2 to + 1 sd) most of the published community interventions showed better results among females compared with males . this difference in the impact of nutritional interventions between male and female might be related to the different age of puberty in the female population compared to the male population . in the age range of the present study female although , there is no nffp in big cities of iran , there are some programs for improving the nutritional status such as providing free milk in schools . a recent publication has shown that school feeding programs focus on milk supplementation had beneficial effects on the physical function and school performances specifically among girls in iran . the results of the mentioned study showed an improvement in the weight of children , psychological test 's scores and the grade - point average following this school feeding program . the intervention in the present study had focused on the snack intake in the school time . there are some reports regarding the nutrition transition in iran , which shows the importance of nutrition intervention to provide more healthy eating dietary habits among welfare groups of adolescents . hence , nutrition intervention especially in the form of nutrition education is needed in big cities and among welfare children and adolescents . although a study among iranian adolescents showed that dietary behavior of adolescents does not accord to their knowledge , which emphasize on the necessity of community intervention programs . a recent study regarding the major dietary pattern among iranian children showed the presence of four major dietary patterns , in which fast food pattern and

sweet pattern as two major dietary patterns can be mentioned among iranian children . in advocacy program audience 's analysis accordingly , one of the prominent strategies in this study was working with media and was meeting with parent - teacher association that both of them were secondary target audiences . we also took into account policy makers in different levels , from national to local as primary audiences . advocacy team had several meetings with management and planning organization at national level and education organization of the fars province as well as principal of the targeted schools . providing nutritious snacks need contribution of private sector such as food industries or factories , but their benefits should be warranted . another choice was community involvement ; which can be achieved by female health volunteers who are working with the health system . advocacy team by using the support of charities and female health volunteers could establish a local factory that produced student 's snacks based on the new definition . however , there are some challenges on the way of expanding this program . mass production of the proposed snacks according to different desires and cultures and getting involvement of food industries with respect to marketing issues is one of those challenges . moreover , providing a supportive environment in order to change the food habits of the students and their parents among the wide range of the population require a sustainable and continuous inter - sector collaboration . although in a limited number of schools , in our study , interventions and advocacy program was successful , expanding this model to another areas around the country depends on convincing the policy makers at national level . in this regard , advocacy team should prepare evidenced based profile and transitional planning to convince the policy makers for improving the rule and regulation of nffp . the same as this study in other studies have also emphasized that there must be efforts to strengthen the capacity within the schools to deal with the nutritional problems either overweight , obesity or malnutrition by using of educational and nutritional intervention . assessing the dietary adherence is very important in nutrition intervention among population . as this population was children and adolescents we had a limitation in the blood sample collection to assess the subject 's dietary adherence . furthermore , this intervention was only focused on the intake of snack in school time and we did not have comprehensive information on the dietary intake of children and adolescents after school all over the day . the investigators propose further investigation in different areas of the country based on socio - cultural differences in order to make necessary modification and adapt this model to other areas . regarding the nutritional needs of the school age children , provision of a good platform for implementing and expanding this efficient model to the whole country based upon the socio - economic situation of each region is advisable to the moh and the moe . community nutrition intervention based on the advocacy process model is effective on reducing the prevalence of underweight specifically among female school aged children .

- **Reference** -
  background : the present study was carried out to assess the effects of community nutrition intervention based on advocacy approach on malnutrition status among school - aged children in shiraz , iran.materials and methods : this case - control nutritional intervention has been done between 2008 and 2009 on 2897 primary and secondary school boys and girls (7 - 13 years old) based on advocacy approach in shiraz , iran . the project provided nutritious snacks in public schools over a 2-year period along with advocacy oriented actions in order to implement and promote nutritional intervention . for evaluation of effectiveness of the intervention growth monitoring indices of pre- and post - intervention were statistically compared.results:the frequency of subjects with body mass index lower than 5% decreased significantly after intervention among girls ($p = 0.02$) . however , there were no significant changes among boys or total population . the mean of all anthropometric indices changed significantly after intervention both among girls and boys as well as in total population . the pre- and post - test education assessment in both groups showed that the student 's average knowledge score has been significantly increased from $12.53.2 to 16.84.3 (p < 0.0001)$ .conclusion : this study demonstrates the potential success and scalability of school feeding programs in iran . community nutrition intervention based on the advocacy process model is effective on

reducing the prevalence of underweight specifically among female school aged children .

- **Generated summary**: The generated summary for each pretrained model:

Ml_1 - $< /s >$ this study has been carried out between 2009 and 2010 in shiraz, iran. in this study, 2897 elementary school students in shiraz, iran were randomly selected based on their household situation and their economic situation. the prevalence of underweight and its related factors among students was determined and weaknesses and strengths of the national free food program (nffp) were analyzed. accordingly, three sub - groups were established : research and evaluation, education and justification and executive group. designing the strategies : three strategies were identified ; education and justification campaign, nutritional intervention (providing nutritious, safe and diverse snacks) and networking. performing the interventions : interventions that were implementing in selected schools were providing a diverse and nutritious snack package along with nutrition education for both groups while the first group (poor and malnourished students) was utilized the package free of charge. duration of intervention was 6 months. research and evaluation : in this step, the literacy and anthropometric indices (bmi) of students were assessed before and after the interventions. the reference for anthropometric measures was the world health organization / national center for health statistics (who / nchs) standards and the cut - offs were - two standard deviations (sd) from$< /s >$

Ml_2 - $< /s >< s >$A recent systematic analysis showed that in 2011, 314 (296 - 331) million children younger than 5 years were mildly, moderately or severely stunted and 258 (240 - 274) million were mildly or severely underweight in the developing countries. In addition, there are reports regarding the prevalence of underweight among elementary school aged children in tehran varied from 6% to 16%. The study also shows that in shiraz university of medical sciences, charities and welfare organization of fars province, two elementary schools and one middle school in the third region of the urban area of shirkaz were selected randomly. The study was conducted with the aim of improving the nffp, so that by its resources all poor children will be covered even in big cities. In the study, the study determines the effects of nutrition intervention in an advocacy process model on children's nutrition and health. The research group was formed with representatives of all stakeholders, including the education organization, welfare organization, food and cosmetic product supervisory office and several non- governmental organizations and charities. In addition to the research group, the research team had several meetings with the students' parents to justify the project and its benefit for their children. The group also had several meeting with the parents of the students who were malnourished and poor and they educated and justified for better nutrition life style. In the present study, the study assesses the effect of the nutrition intervention on school age children and their families. The results of the study are presented as mean sd and proportions as appropriated. The results are expressed as mean SD and percentages as appropriated. The analysis of the results of this study is conducted as follows: the study population contains 2897 children ; 70.8% were primary school students and 29.2% were secondary school students. The research team was formed to analyze the effects on the malnutrition status of students and their parents. The main focus of the research was education and justification campaign, nutritional intervention, providing nutritious snacks, nutrition education, and networking. The report also discusses the importance of community nutrition intervention to improve the nutrition status of school-aged children in the country. The authors of the report state that the study was carried out between 2009 and 2010, iran, iran, and fars provinces. The author of the paper, Shiraz University of Medical Sciences, is a member of the medical sciences and charities and education organization. He is the author of a paper describing the study and its results. In this paper, the author describes the study as a blending of

Ml_3 - $< /s >< s >< s >< s >$ background : national free food program (nffp) is

implemented in elementary schools of deprived areas to cover all poor students. however, this program is not conducted in slums and poor areas of the big cities so many malnourished children with low socio - economic situation are not covered by this program. therefore, the present study determines the effects of nutrition intervention in an advocacy process model on the prevalence of underweight in school aged children in the poor area of shiraz, iran.materials and methods : this interventional study has been carried out between 2009 and 2010. in coordination with education organization of fars province, two elementary schools and one middle school in the third region of the urban area of chiraz were selected randomly. in those schools all students (2897, 7 - 13 years old) were screened based on their body mass index (bmi) by nutritionists. according to convenience method all students divided to two groups based on the economic situation ; family revenue and head of household's job and nutrition situation ; the first group were poor and malnoured students and the other group were well nourished or well - off students. for this report, the children's height and weight were entered into center for disease control and prevention (cdc) to calculate bmi and bmi - for - age z - scores based on cdc for diseases control, prevention and growth standards (who / nchs) standards and the significance of the difference between proportions was calculated using two - tailed z - tests for independent proportions. for implementing the interventions, the weight was to the nearest 0.results:the frequency of subjects with bmi lower than $<$ 2 sd decreased significantly after intervention among non - welfare girls ($p < 0.01$) . in total population without separating by sex groups, we found no significant change in this population.conclusion:this study revealed that the result of this community nutrition intervention study revealed the successful result of the advocacy program based on this community program had been successful on reducing the prevalence underweight specifically among the underweight girls. $< /s >$

Ml_4 - $< /s >$ The study was conducted between 2009 and 2010 in shiraz, iran. In the study, the number of malnourished children in the country increased from 44% to 39.4%. The number of children with low body weight increased from 8% to 9% after the intervention.$< /s >$

Ml_5 - $< /s >< s >< s >< s >$In this paper, the authors present the results of a study on the prevalence of underweight and malnourished school children in shiraz, iran. The authors assess the effect of a six-month long intervention designed by the universityś obesity and nutrition advocacy team on the "prevalence of under weight in school aged children in the poor area of Shiraz. In order to evaluate the effectiveness of the intervention, the students are randomly selected from two elementary schools and one middle school in the third region of the city. They are then enrolled in a free snack package along with other food and water supplies. After the intervention has been implemented in two schools, the disease control and prevention office of the local government receives a report on the response following the intervention. Although there is no significant difference in the rate of morbidity or mortality between the wealthy and poor students, there is a significant increase in the proportion of healthy eating for both genders. The cause of this change is attributed to the introduction of whole grains in the school lunches. Following this point, the work of the advocacy team is extended to include parents as well as representatives from several governmental and non-governmental organizations. The final product consists of a set of educational pamphlets targeted at all levels of the school and encourages parents to engage their children in healthier eating habits.$< /s >$

Ml_6 - This paper focuses on the effects of public health intervention on malnutrition, particularly among school aged students in the poor areas of shiran. The study is based on an iranan school population and involves three groups: blue1) education and justifying; 2) research and evaluation; and 3) executive group. In this case, all schools are provided with a variety of food options for both groups. Education and justification has been used to educate parents about the benefits of the project. After six months of follow-up, the results show that there is no significant difference in the severity or

frequency of malnourished student's underweight.

Ml_7 - background : in iran, the national free food program is implemented in elementary schools of deprived areas to cover all poor students. however, this program is not conducted in slums and poor areas of the big cities so many malnourished children with low socio-economic situation are not covered by nffp. therefore, the present study determined the effects of nutrition intervention in an advocacy process model on the prevalence of underweight in school aged children in the poor area of shiraz , a iranian province. methods : this was a cross-sectional study carried out between 2009 and 2010 in shirax , which has been conducted in two elementary schools and one middle school in the third region of the urban area of fars province. these schools were selected randomly from each school. they divided into two groups according to their economic situation; family revenue and head of household 's job and nutrition situation; the first group was malnourisheted and the other group was well nourished or well - off students. the data were collected using a validated and reliable questionnaire. the mean of age in welfare group was 10.0 2.3 and 10.5 2.5 in non- Welfare group. the frequency of subjects with bmi lower than 2 sd decreased significantly after intervention among non- welfare girls (p 0.01). there were no significant decreases in the frequencies of those who had normal body mass index. the student 'equilibrium knowledge score increased from 12.5 3.2 to 16.8 4.3. the odds ratio of sever thinness and thinness in non - welfare compared with welfare is 3.5 (or = 3.5, confidence interval [ci] = 2.5 - 3.9, p

Model	**ROUGE-1**	**ROUGE-2**	**ROUGE-3**	**ROUGE-L**	**CHRF-1**	**Meteor**	**BertScore**	**FactCheck**
Ml_1	0.3934	0.0894	0.0189	0.178	0.4416	0.242	0.8421	0.90
Ml_2	0.3598	0.1263	0.0452	0.1499	0.3857	0.2857	0.8354	1.0
Ml_3	**0.5087**	**0.1993**	**0.1053**	**0.2822**	**0.5128**	**0.4141**	**0.8612**	1.0
Ml_4	0.2286	0.0432	0.0072	0.1571	0.1518	0.1001	0.8419	1.0
Ml_5	0.4084	0.1099	0.0594	0.2147	0.4366	0.2376	0.8461	1.0
Ml_6	0.3964	0.0952	0.012	0.1834	0.3203	0.1902	0.8418	1.0
Ml_7	**0.4844**	**0.1961**	**0.1063**	**0.2813**	**0.4846**	**0.3587**	**0.8588**	**0.85**

Table 2: Evaluation of Example-long-document 2.